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This is the last issue this year that is rich with original papers, review papers, case reports and opinion papers. At the end of the year I would like to thank the editorial board, the publishing team and the publishing manager for their tremendous support this year.

Rahmanian, V et al; did a cross-sectional and conducted through a secondary data analysis of Jahrom County in 2011 and 2015 to determine the YPLL due to premature death. Cardiovascular diseases were the first and most common causes of mortality in both genders. Mehmet Rami Helvaci, M.R et al looked at the relationship between irritable bowel syndrome (IBS) and smoking. The authors concluded that smoking may be one of the several causes of IBS by causing a vascular endothelial inflammation all over the body.

Mohammadnejad, E et al; explore live experience of nurses about occupational exposures in emergency wards. The results of this study show that there is complex process for follow-up and unsupported after occupational exposures. Doulatabad N et al did a descriptive correlation study to determine the relationship between organizational culture & personality assassination among educational staff of Yasuj University of Medical Sciences. According to the findings of this research, it is necessary to provide training on the consequences of the assassination of the personality of the workplace for all educational staff, including management, faculty members and staff.

Talebloo M et al; conducted a study to determine the effectiveness of positive thinking skills on Life expectancy in

patients with multiple sclerosis. The results of this method can be used to increase self-perception and life expectancy can be used. Etemadifar, S. et al; did a clinical trial to investigate the effects of an educative-supportive intervention in relieving stress. The authors concluded that nurses can use the results of this study to effectively implement the suitable interventions for reducing challenges of family caregivers in caring situation.

Zamiri S et al; attempt to compare sagittal lumbar spine and sagittal pelvic tilt range of motion between athletes with CLBP who regularly ride bicycle and healthy controls without regular bicycle riding. Regular sitting position on the bicycle for prolonged period may result adaptations in sagittal lumbar and pelvic ROM which may contribute to the development of LBP. An opinion paper looked at the new perspective in Baboon Cardiac Xeno Transplantation.

Solati, K. et al; looked at the effects of medicinal plants on dopamine reward system. Phytotherapy alone cannot be effective in treating it but instead a combination of different therapies should be adopted to fight it. Bazargani, Z et al looked at risk factors of suicide. The most common precipitating factor was family conflict followed by psychiatric disorder and unemployment.

Iran Ghaderi, I et al; looked at the effect of training self-encouragement skills on Genital Self-Image in women with a physical-motor handicap. Learning the self-encouragement skills can increase self-esteem in people, this leads to a positive body self-image. Farsaraei, A. et al; looked at the patient safety culture from the perspective of emergency nurses.

Kuhbanani, S.S conducted a research to evaluate the dimensions of developmental family function in predicting the executive functions of deaf children. Besharati, M et al; investigated the relevant factors of coronary artery involvement in patients with KD. The authors found significant associations between active phase reactant (ESR, CRP, Neutrophil count) and cardiac complications in Kawasaki disease patients.

Botyar M et al reviewed complication of vaginal delivery after previous cesarean delivery. One of the most effective ways to reduce the incidence of cesarean sec-

tion is to carry out normal delivery after cesarean section and to reduce cesarean section repeatedly. Hosseini, S.H., et al; compared the effectiveness of Religious Cognitive Behavioral Therapy (RCBT), Cognitive Behavioral Therapy (CBT), and Sertraline on Depression in Patients after Coronary Artery Bypass Graft Surgery.

Motevasselian, M, et al; described a case with retained placenta after normal vaginal delivery with unsuccessfully treatment with drugs and curettage and thus hysterectomy combined with antibiotic therapy because of the evidences of phlebitis was inevitably considered as the final treatment approach. Modaresi, M et al; compared the effects of raisin's extract and fluoxetine on depression symptoms in mice.

Susan Bahrami, et al evaluate Quality of work life (QWL) and its dimensions in higher education institution Qom. Farahbod, F. et al; looked at medicinal plant effective on prolactin. Marsal R et al; carried out a study using a pretest-posttest semi-experimental design to investigate the effectiveness of cognitive-existential therapy on reducing demoralization in the elderly. The results showed a significant reduction in the demoralization and cognitive distortions compared to the pretest.

Eilami, O et al; studied the antimicrobial effects of hydroxytyrosol extracted from olive leaves on propionibacterium. Ebad, M et al; looked at genetic diversity and evaluation of wheat cultivars (Tricum) raised at the molecular level were conducted using the ISSR marker. Keshavarzi, F et al; compared pregnancy outcome among pregnant women with gestational diabetes mellitus (GDM) who received low-dose supplementary vitamin D, high-dose vitamin D, or placebo.

Rezavand, N et al compared FMD of the brachial artery and endothelial function between healthy mothers and those who were diagnosed by pre-eclampsia. Zangeneh, M et al; investigated the epidemiological characteristics of colposcopy. It can be concluded that performing colposcopy, as a screening method for the early diagnosis of premalignant cervical lesions. Bayati, A et al did a semi-experimental and pre-test-post-test type to determine the efficacy of acceptance and commitment therapy on death anxiety and obsessive in the elderly.

Abbasi, P et al did a semi-experimental study to investigate the effectiveness of group training based on the hope therapy approach on psychological well-being and resilience in divorced women. Chobari SD et al discussed the comprehensive planning in safety and reducing accidents, risk identification and hazards assessment.

Tayebi, N et al reviewed the effectiveness of anger management training through cognitive-behavioral method on deducting marital conflicts among women. Sara, N et al; looked at the epidemiological findings of sudden cardiac death. Findings show that about 77% of male subjects were with an average of 58.05 years (SD=13.56).

Bidari, A et al; investigated the causes and the factors affecting short- and long-term mortality rates in such patients is of utmost importance. The authors concluded that identifying the predictors and the factors associated with survival in patients suffering from acute coronary syndrome could affect their survival rates. Bidari, A et al; evaluated the relationship between mortality rate of patients and time trends of request to pre-hospital emergency medical services (PEMS). The authors concluded that acute chest pain in patients appears to have a rhythmic pattern with a maximum incidence at late night and around noon.

Noori, M et al; The objective of the present research is studying the relationship between body image and difficulty in emotion regulation and sexual satisfaction of healthy women with women undergoing mastectomy. Doulatabad, S.N et al; performed a study with aimed to determine the effect of massage of Hugo point on severity of pain in patients undergoing laparoscopic cholecystectomy.

Amirmohamadi, M et al; investigated the correlation between spiritual health and depression among the elderly patients with cancer. Alleni, J.R et al; did a qualitative research is carried out to study the effective factors of professional ethical competency in medical students through using participants' life experiences. Saeedinejad, S et al; measured serum levels of procalcitonin in patients with SIRS positive acute pyelonephritis before and after treatment and survey of

relationship between changes in serum levels of procalcitonin with response to treatment in patients with SIRS positive acute pyelonephritis.

Hedeshi, V.M did a quasi-experimental with pre-test and post-test with control group design to investigate the effect of training self-regulatory strategies based on Pintrich's model on academic engagement and task value of the high school students. Nasiri, A.A et al did a clinical trial to investigate the helping effect of voice of the Quran on vital signs and level of consciousness in the patients admitted to the ICU wards.

Shahdadi, H et al conducted a study to identify the importance of social factors role in mental health as well as the relationship between perceived social support and resilience with mental health of students. Mansouri, A.; et al did a quasi-experimental before-after research to investigate effect of education by focus group discussion on mothers' performance and awareness of domestic accidents in children.

Farahzadi, Z et al focuses in the Intervention Program aimed to improving the study habits of students. Academic performance is highly influences by study habits. This study held to use the study habits of the students, the way they learn to show their improvement in an English language learning, their lessons and their self-awareness.

Nasiriani, K et al; did a clinical trial to determine the effect of effective fluids on thirst, nausea and vomiting in patients undergoing coronary artery bypass graft surgery in patients admitted to the ICU of Cardiac surgery. Azizi, A. et al; looked at the effect of management of Islamic principles on improving the work process in Yasuj University of Medical Sciences. Rayati, M et al; conducted a study to evaluate the impact of discharge nurse on re-hospitalization and quality of life of mothers of neonates re-hospitalized in the neonatal intensive care unit.

Gholami, S.S et al; did descriptive cross-sectional study to evaluate nutrition status of patients newly admitted to hospital. Saadat, M. et al; did a descriptive-correlational to investigate the relationship between the executive and healthcare reform plan Satisfaction of patients and of Yasuj hospitals were

designed. The authors concluded that healthcare managers need to equip hospitals and centers for up to date machinery and Health equipment and adequate and appropriate funds in this area.

Soheili, M et al report a case of 42-year-old case of spinal epidural abscess due to a previous treated brucellosis. The case was treated without any need to surgical treatment including streptomycin, doxycycline and rifampin. Soheili, M et al; report a case of eventration of diaphragm which is an uncommon congenital abnormality which is seen in newborns and adults with different manifestations. Rahmati M et al; compared the life quality among female students with and without primary dysmenorrhea. The results of the study showed that life quality in people with primary dysmenorrhea was significantly lower than those without dysmenorrhea.

Shahbolaghi, F. M. et al did a descriptive-analytical study with a sample size of 400 old people aged 60 years or over to estimate mental health of the elderly in Tehran, Iran. They suggested that the health-care administration pay more attention in educational programs toward the essential role of relative and predictive factors in improving the elderly's health.

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# Irritable bowel syndrome and smoking

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## Abstract

**Background:** We tried to understand whether or not there is a significant relationship between irritable bowel syndrome (IBS) and smoking.

**Method:** IBS is diagnosed according to Rome II criteria in the absence of red flag symptoms.

**Results:** One hundred and four patients with IBS and 104 controls were studied. Interestingly, 78.8% (82 patients) of IBS patients were female with a mean age of  $51.2 \pm 9.9$  (29-70) years. Prevalence of smoking was significantly higher in cases with IBS (29.8% versus 11.5%,  $p < 0.001$ ). Similarly, prevalences of hyperbetalipoproteinemia, hypertriglyceridemia, and dyslipidemia were higher in cases with IBS but the difference was significant just for hypertriglyceridemia (26.9% versus 16.3%,  $p < 0.01$ ) probably due to the small sample size of the study. On the other hand, mean body mass index (BMI) and prevalences of hypertension (HT) and diabetes mellitus (DM) were all lower in cases with IBS but the difference was significant just for HT (10.5% versus 26.9%,  $p < 0.001$ ) probably due to the small sample size of the study, again.

**Conclusion:** Although IBS may have a complex mechanism with a higher prevalence in females, smoking may be one of the several causes of IBS by causing a vascular endothelial inflammation all over the body. The disseminated inflammation may be the cause of lower BMI and associated lower

prevalences of HT and DM in the IBS cases. On the other hand, higher prevalences of hyperbetalipoproteinemia, hypertriglyceridemia, and dyslipidemia in cases with IBS may actually indicate their roles as acute phase reactants in smokers in the body.

### Key words:

Irritable bowel syndrome, smoking, metabolic syndrome, hypertriglyceridemia, dyslipidemia

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## Introduction

One of most frequent applications to primary health centers and internal medicine and gastroenterology polyclinics are due to recurrent upper abdominal discomfort (1). Although gastroesophageal reflux disease, esophagitis, duodenal and/or gastric ulcers, erosive gastritis and/or duodenitis, celiac disease, chronic pancreatitis, and malignancies are found among possible causes, irritable bowel syndrome (IBS) and chronic gastritis are probably the most frequently diagnosed diseases, clinically. Flatulence, periods of diarrhea or constipation, repeated toilet visits due to urgent evacuation or early filling sensation, excessive straining, feeling of incomplete evacuation, frequency, urgency, reduced feeling of well-being, and eventually disturbed social life are often reported by IBS patients. Although many patients relate onset of symptoms to intake of food, and often incriminate specific food items, a meaningful dietary role is doubtful in IBS. According to literature, 10-20% of the general population have IBS, and it is more common among females for unexplained reasons (2). Psychological factors seem to precede onset or exacerbation of gut symptoms, and many potentially psychiatric disorders including anxiety, depression, or sleep disorders frequently coexist with IBS (3). For instance, thresholds for sensations of initial filling, evacuation, urgent evacuation, and utmost tolerance recorded via a rectal balloon significantly decreased by focusing the examiners' attention on gastrointestinal stimuli by reading pictures of malignant gastrointestinal disorders in IBS cases (4). So although IBS is described as a physical instead of a psychological disorder according to Rome II guidelines, psychological factors may be crucial for triggering of the physical changes in the body. IBS is actually defined as a brain-gut dysfunction according to the Rome II criteria, and it may have more complex mechanisms affecting various systems of the body with a low-grade inflammatory state (5). For example, it was detected in a previous study that IBS may even terminate with urolithiasis in a significant proportion of patients (6). Similarly, some authors studied the role of inflammation via colonic biopsies in 77 cases with IBS (7). Although 38 patients had normal histology, 31 patients demonstrated microscopic inflammation and eight patients fulfilled criteria for lymphocytic colitis. However, immunohistology revealed increased intraepithelial lymphocytes as well as increased CD3 and CD25 positive cells in lamina propria of the group with "normal" histology those indicate immune activation. These features were more evident in the microscopic inflammation group who additionally revealed increased neutrophils, mast cells, and natural killer cells. All of these immunopathological abnormalities were the most evident in the lymphocytic colitis group who also demonstrated HLA-DR staining in crypts and increased CD8 positive cells in the lamina propria (7). A direct link between the immunologic activation and IBS symptoms was provided by work of some other authors who demonstrated not only an increased incidence of mast cell degranulation in the colon but also a direct correlation between proximity of mast cells to neuronal elements and pain severity in IBS (8). In addition to these findings, there is some evidence for extension of the inflammatory

process beyond mucosa. Some authors addressed this issue in ten patients with severe IBS by examining full-thickness jejunal biopsies obtained via laparoscopy (9). They detected a low-grade infiltration of lymphocytes in myenteric plexus of nine patients, four of whom had an associated increase in intraepithelial lymphocytes and six demonstrated evidence of neuronal degeneration. Nine patients had hypertrophy of longitudinal muscles and seven had abnormalities in number and size of interstitial cells of Cajal. The finding of intraepithelial lymphocytosis was consistent with the reports of Chadwick and colleagues in the colon (7) and Wahnschaffe and colleagues in the duodenum (10). On the other hand, smoking is well-known cause of vascular endothelial inflammation all over the body. We tried to understand whether or not there is a significant relationship between IBS and smoking.

## Material and methods

The study was performed in the Internal Medicine Polyclinic of the Dumlupinar University between March 2006 and February 2007. Consecutive patients with upper abdominal discomfort were included into the study. We did not take patients above the age of 70 years to avoid debility induced weight loss in elders. Their medical histories including smoking habit, hypertension (HT), diabetes mellitus (DM), dyslipidemia, and already used medications were learnt. A routine check up procedure including fasting plasma glucose (FPG), low density lipoprotein cholesterol (LDL-C), triglycerides, high density lipoprotein cholesterol (HDL-C), an abdominal ultrasonography, and a questionnaire for IBS was performed. IBS is diagnosed according to Rome II criteria in the absence of red flag symptoms such as pain and diarrhea that often awakens/interferes with sleep, weight loss, fever, and abnormal physical examination findings. Patients with devastating illnesses including type 1 DM, malignancies, acute or chronic renal failure, chronic liver diseases, hyper- or hypothyroidism, and heart failure were excluded to avoid their possible effects on weight. Current daily smokers at least for the last six months and cases with a history of five pack-years were accepted as smokers. Body mass index (BMI) of each case was calculated by the measurements of the same physician instead of verbal expressions since there is evidence that heavier individuals systematically underreport their weight (11). Weight in kilograms is divided by height in meters squared (12). Cases with an overnight FPG level of 126 mg/dL or greater on two occasions or already using antidiabetic medications were defined as diabetics. An oral glucose tolerance test with 75-gram glucose was performed in cases with a FPG level between 100 and 126 mg/dL, and diagnosis of cases with a 2-hour plasma glucose level of 200 mg/dL or greater is DM (12). Additionally, patients with dyslipidemia were detected, and we used the National Cholesterol Education Program Expert Panel's recommendations for defining dyslipidemic subgroups (12). Dyslipidemia is diagnosed when LDL-C is 160 mg/dL or greater and/or triglyceride is 200 mg/dL or greater and/or HDL-C is lower than 40 mg/dL. Office blood pressure (BP) was checked after 5 minutes of rest in seated position with a mercury sphygmomanometer

on three visits, and no smoking was permitted during the previous 2 hours. A 10-day twice daily measurement of blood pressure at home (HBP) was obtained in all cases, even in normotensives in the office due to the risk of masked HT after a 10-minute education session about proper BP measurement techniques (13). The education included recommendation of upper arm while discouraging wrist and finger devices, using a standard adult cuff with bladder sizes of 12 x 26 cm for arm circumferences up to 33 cm in length and a large adult cuff with bladder sizes of 12 x 40 cm for arm circumferences up to 50 cm in length, and taking a rest at least for a period of 5 minutes in the seated position before measurement. An additional 24-hour ambulatory blood pressure monitoring (ABP) was not required due to an equal efficacy of the method with HBP measurement to diagnose HT (14). Eventually, HT is defined as a BP of 135/85 mmHg or greater on HBP measurements (13). Eventually, all patients with IBS were put into the first, and age and sex-matched controls were put into the second groups. Mean BMI and prevalence of smoking, HT, DM, hyperbetalipoproteinemia, hypertriglyceridemia, and dyslipidemia were detected in each group and compared in between. Mann-Whitney U test, Independent-Samples T test, and comparison of proportions were used as the methods of statistical analyses.

## Results

One hundred and four patients with IBS and 104 controls were included into the study. Interestingly, 78.8% (82 patients) of the IBS patients were female with a mean age of  $51.2 \pm 9.9$  (29-70) years (Table 1). Prevalence of smoking was significantly higher in cases with IBS (29.8% versus 11.5%,  $p < 0.001$ ). Similarly, prevalence of hyperbetalipoproteinemia, hypertriglyceridemia, and dyslipidemia were all higher in cases with IBS but the difference was significant just for hypertriglyceridemia (26.9% versus 16.3%,  $p < 0.01$ ) probably due to the small sample size of the study. On the other hand, mean BMI

and prevalence of HT and DM were all lower in the IBS patients but the difference was significant just for HT (10.5% versus 26.9%,  $p < 0.001$ ) probably due to the small sample size of the study, again.

## Discussion

Smoking may be found among one of the most common causes of vasculitis in the world. It is a major risk factor for the development of atherosclerotic endpoints including coronary artery disease (CAD), peripheral artery disease (PAD), chronic obstructive pulmonary disease (COPD), cirrhosis, chronic renal disease (CRD), and stroke (15, 16). Its atherosclerotic effects are the most obvious in Buerger's disease. It is an obliterative disease characterized by inflammatory changes in small and medium-sized arteries and veins, and it has never been reported in the absence of smoking in the literature. Although the well-known strong atherosclerotic effects of smoking, some studies reported that smoking in humans and nicotine administration in animals are associated with a decreased BMI (17). Evidence revealed an increased energy expenditure during smoking both on rest and light physical activity (18), and nicotine supplied by patch after smoking cessation decreased caloric intake in a dose-related manner (19). According to an animal study, nicotine may lengthen intermeal time and simultaneously decreases amount of meal eaten (20). Additionally, BMI seems to be the highest in former, the lowest in current and medium in never smokers (21). Smoking may be associated with postcessation weight gain but evidence suggests that risk of weight gaining is the highest during the first year after quitting and declines over the years (22). Similarly, although CAD was detected with similar prevalences in both genders in a previous study (23), prevalence of smoking and COPD were higher in male patients with CAD against the higher prevalences of BMI, white coat hypertension (WCH), LDL-C, triglyceride, HT, and DM in female patients with CAD as the other atherosclerotic risk factors. This result

**Table 1: Comparison of cases with irritable bowel syndrome and controls**

Variables	Cases with IBS*	p-value	Control cases
Number	104		104
<b>Female ratio</b>	<b>78.8% (82)</b>	Ns†	78.8% (82)
Mean age (year)	51.2 ± 9.9 (29-70)	Ns	51.2 ± 10.6 (27-70)
Mean BMI‡	29.3 ± 5.3 (19-48)	Ns	<b>30.2 ± 6.2 (21-52)</b>
<b>Prevalence of smoking</b>	<b>29.8% (31)</b>	<b>&lt;0.001</b>	11.5% (12)
<b>Prevalence of HT§</b>	10.5% (11)	<b>&lt;0.001</b>	<b>26.9% (28)</b>
<b>Prevalence of DM  </b>	14.4% (15)	Ns	<b>20.1% (21)</b>
<b>Prevalence of hyperbetalipoproteinemia</b>	<b>11.5% (12)</b>	Ns	8.6% (9)
<b>Prevalence of hypertriglyceridemia</b>	<b>26.9% (28)</b>	<b>&lt;0.01</b>	16.3% (17)
<b>Prevalence of dyslipidemia</b>	<b>32.6% (34)</b>	Ns	26.9% (28)

\*Irritable bowel syndrome †Nonsignificant ( $p > 0.05$ ) ‡Body mass index §Hypertension ||Diabetes mellitus

may indicate both the strong atherosclerotic and weight decreasing roles of smoking (24). Similarly, the incidence of a myocardial infarction is increased sixfold in women and threefold in men who smoke at least 20 cigarettes per day compared to the never smoked cases (25). In other words, smoking is more dangerous for women about the atherosclerotic endpoints probably due to the higher BMI and its consequences in them. Parallel to the above results, the proportion of smokers is consistently higher in men in the literature (16). So smoking is probably a powerful atherosclerotic risk factor with some suppressor effects on appetite. Smoking-induced weight loss may be related with the smoking-induced vascular endothelial inflammation all over the body, since loss of appetite is one of the major symptoms of inflammation in the body. Physicians can even understand healing of their patients from their returning appetite. Several toxic substances found in cigarette smoke get into the circulation by means of the respiratory tract, and cause a low-grade vascular endothelial inflammation until clearance from the circulation. But due to the repeated smoking habit of individuals, the clearance process never terminates. So the patients become ill with loss of appetite, permanently. In another explanation, smoking-induced weight loss is an indicator of being ill instead of being healthy (19-21). After smoking cessation, normal appetite comes back with a prominent weight gain in the patients but the returned weights are their physiological or 'normal' weights, actually. On the other hand, smoking as a pleasure in life may also show the weakness of volition to control eating so it comes with additional weight excess and its consequences. Similarly, prevalence of HT, DM, and smoking were the highest in the highest triglyceride having group as another significant component of the metabolic syndrome in another study (26).

Due to the prolonged survival of human beings, systemic atherosclerosis probably will be the main health problem all over the world in this century, and its associations with some metabolic disorders and smoking and alcohol are researched under the title of metabolic syndrome in the literature (27, 28). The syndrome is characterized by a low-grade inflammatory process on vascular endothelium initiated in early years of life (29). The inflammatory process is accelerated by some factors including excess weight, smoking, alcohol, chronic infections and inflammations, and cancers (30, 31). Metabolic syndrome can be slowed down with appropriate nonpharmaceutical approaches including lifestyle changes, diet, and exercise in early years of life (32). The syndrome includes overweight, WCH, impaired fasting glucose, impaired glucose tolerance, hyperbetalipoproteinemia, hypertriglyceridemia, dyslipidemia, smoking, and alcohol for the development of irreversible consequences including obesity, HT, DM, COPD, cirrhosis, CRD, PAD, CAD, stroke, early aging, and premature death (23). In another perspective, the metabolic syndrome may be the most significant disease of human life decreasing its quality and duration at the moment. The syndrome has become increasingly common all over the world, for example 50 million people in the United States are affected (33). The syndrome induced

accelerated atherosclerotic process all over the body may be the leading cause of early aging and premature death for both genders. For example, CAD and cancers are the leading causes of death in developed countries. Similarly, although the well-known mutagenic effects of smoking, its role in cancers may also be related to the systemic atherosclerotic process that immune cells cannot eradicate cancer cells due to the insufficient blood supply, effectively (15).

As a conclusion, although IBS may have a complex mechanism with a higher prevalence in females, smoking may be one of the several causes of IBS by causing a vascular endothelial inflammation all over the body. The disseminated inflammation may be the cause of lower BMI and associated lower prevalence of HT and DM in the IBS cases. On the other hand, higher prevalence of hyperbetalipoproteinemia, hypertriglyceridemia, and dyslipidemia in cases with IBS may actually indicate their roles as acute phase reactants in smokers in the body.

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# Assessment of Coronary Artery Involvement and its Relevant Factors in Children with Kawasaki Disease

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## Abstract

**Background:** Kawasaki Disease (KD) is a multisystem inflammatory disease of unknown origin that presents with high fever, followed by skin rash, conjunctival hyperemia, oral mucosal hyperemia, fissured and reddened lips, strawberry-like tongue, non-purulent cervical lymphadenopathy, and erythema and edema of the hands and feet. Cardiac involvement is its most important complication that usually presents after the second week. It presents itself in the form of myocarditis, pericarditis, pericardial effusion, valvular involvement, and most importantly, coronary artery involvement and aneurysm formation. Given the significance of cardiac involvement, here we have investigated the relevant factors of coronary artery involvement in patients with KD.

**Materials and Methods:** One-hundred and twenty (120) KD patients attending Qom's Hazrat Fateh Masoumeh Hospital (referral center) from 2010 – 2016 were studied. Using a questionnaire, data were collected from the patients and their medical records. This study was cross-sectional. Random sampling was done. Data were analyzed using SPSS software.

**Results:** Of the 120 patients examined, 57.5% had mild coronary artery involvement, among whom 54.2% had mild coronary artery dilatation; 7.5% had coronary artery aneurysm, and 59.2% had mitral insufficiency. 39.2% had certain degrees of pericardial effusion. Examination of demographics (age, sex & weight) and laboratory data indicated significant associations between cardiovascular involvement and neutrophil count ( $p=0.003$ ), CRP ( $p<0.001$ ), and ESR ( $p<0.001$ ).

**Conclusions:** There are significant associations between active phase reactant (ESR, CRP, Neutrophil count) and cardiac complications in Kawasaki disease patients.

**Key words:** Kawasaki disease, coronary artery involvement, clinical signs, lab findings

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## Introduction

Kawasaki Disease (KD) is a multisystem inflammatory disease of unknown origin that presents with high fever, followed by skin rash, conjunctival hyperemia, oral mucosal hyperemia, fissured and reddened lips, strawberry-like tongue, non-purulent cervical lymphadenopathy, and erythema and edema of the hands and feet. It was first detected and introduced by Tomisaku Kawasaki in Japan [1], however, it is now observed among all races across the world [2].

The disease is diagnosed based on clinical symptoms. Fever persisting for at least 5 days and four of the following symptoms can establish the diagnosis of KD: 1- bilateral bulbar conjunctivitis; 2- hyperemia of the oropharyngeal mucosa, strawberry-like tongue and fissured red lips; 3- erythema and edema of the hands and feet during the acute phase and desquamation during the subacute phase; 4- unilateral cervical lymphadenopathy exceeding 1.5 cm; 5- rash (macular, hives, erythema multiforme) [3]. A hallmark of this disease is vasculitis of small and medium-sized vessels of different organs, with an inclination toward the involvement of coronary vessels. During the acute phase, all vessels are affected with vasculitis; later on only medium and large-sized vessels may remain affected [4]. This syndrome is observed all over the world, however, it is most prevalent in Asia. The annual attack rate in Asian Americans is greater than in non-Asians [5]. KD is now the most important cause of acquired cardiac disease among children in many countries across the world. Cardiac involvement is the most significant complication of the disease which often presents after the second week [6]. It includes myocarditis, pericarditis, pericardial effusion, valvular involvement and most importantly, coronary artery involvement and aneurysm formation [3,6,7]. The use of aspirin and intravenous gamma globulin (IVIG) considerably reduces the probability of developing cardiac complications. Given the low prevalence of rheumatic heart disease in developed countries, this disease is the most common cause of acquired cardiac disease in children [8].

Thus, bearing in mind the prevalence of KD and the development of cardiac complications in developing countries, this research was conducted with the goal of determining the relevant factors of coronary involvement in KD patients attending Qom's Hazrat Fatemeh Masoumeh Hospital (referral center) from 2010 – 2016 (over a 5-year-period).

## Materials and methods

### Study design and subjects

A descriptive – analytic cross-sectional study was conducted. The samples were selected on a census basis, from KD patients attending Qom's Hazrat Fatemeh Masoumeh Hospital (referral center) from 2010 – 2016. The research population consisted of all KD patients who had attended the hospital from March 2010 to February 2016.

### Data collection

A patient questionnaire was used to collect data. All KD patients' records were extracted from the archives and their demographic data as well as their blood test results were registered. In addition to the background data collected, information related to the patients' assessment in terms of cardiac complications, such as, myocarditis, pericarditis, pericardial effusion, valvular involvement and most importantly, coronary artery involvement and aneurysm formation were also collected; clinical and echocardiographic assessment results were also registered.

### Data analysis

Data were analyzed using SPSS version 20, and were described using descriptive statistical indices. Chi square and Fischer's exact test were used to compare the percentage affected with cardiac complications among the groups. T-test was used to compare ESR and WBC with cardiac involvement between the two groups, and level of significance (p-value) was set at 0.05.

## Results

As seen in the table, among those affected with cardiovascular disease (CVD), 58% were boys and 42% were girls. No significant association was observed between gender and cardiac complications (p value=0.447) [Table 1].

Another feature examined was coronary artery aneurysm; out of 111 cases, 6 (5%) had left coronary aneurysm. One person (0.8%) had right coronary aneurysm, and 2 (1.7%) had aneurysms on both sides. These 111 persons (92.5%) had no evidence of aneurysm on echocardiography. Moreover, 59.2% had mild mitral valve insufficiency and the remaining 40.8% had none. 39.2% of the patients had mild pleural effusion and 60.8% did not have pericardial effusion. There were no abnormal findings in most of the patients' ECGs; only 10% had abnormal ECGs. Ejection fraction (EF) was also investigated; 95.8% had normal, and the remaining had reduced, EF.

Table 2 shows the demographic variables and lab findings based on coronary artery complication. Among these variables, neutrophil count, ESR & CRP were significantly associated with coronary artery complications.

The mean neutrophil count in patients with cardiac complications was 10,277.54, and in patients without complications it was 7,657.06, indicating a significant difference (p value=0.003). Patients with cardiac complication had a higher neutrophil count as opposed to patients who did not [Table 2].

The mean ESR level in patients with cardiac complications was 100.6957 and in patients without complication it was 76.2157, which was significant (p value=0.000) [Table 2].

In patients with cardiac complications, the mean CRP was 45.5826, and in those without complications it was 26.9039; with a p value of 0.000 a significant association

Table 1: Gender distribution among Kawasaki Disease patients in Hazrat Fatemeh Masoumeh Hospital from 2010 to 2016

Disease	Boy		Girl		P value	OR	Confidence interval
	Number	Percent	Number	Percent			
Present	40	58	29	42	0.447	0.754	1.561-0.364
Absent	26	51	25	49			

Table 2: Distribution of demographic variables and lab findings based on coronary artery complication in patients with Kawasaki Disease

	Coronary artery complication	Number	Mean	Standard deviation	P value
Age	Present	51	3.4167	2.09575	0.705
	Absent	69	3.5978	2.88684	
Weight	Present	51	15.5961	5.77401	0.355
	Absent	69	16.9348	9.01588	
WBC	Present	51	13839.22	5823.026	0.067
	Absent	69	15811.59	5746.650	
Neutrophil count	Present	51	7657.06	4769.214	0.003
	Absent	69	10277.54	4497.883	
Albumin	Present	51	3.6837	0.46882	0.121
	Absent	69	3.5401	0.51822	
ESR	Present	51	76.2157	34.58515	<0.001
	Absent	69	100.6957	31.27266	
CRP	Present	51	26.9039	20.83623	<0.001
	Absent	69	45.5826	24.17445	
Hemoglobin	Present	51	10.500	1.6659	0.620
	Absent	69	46.06	53.423	
SGOT	Present	51	46.06	53.423	0.271
	Absent	69	146.41	646.020	
SGPT	Present	51	44.61	77.731	0.230
	Absent	69	116.88	422.328	
Platelets	Present	51	417254.90	186857.576	0.906
	Absent	69	413449.28	164645.210	

Table 3: The duration of fever and coronary artery involvement in patients with Kawasaki Disease

		Coronary artery involvement		P	OR	Confidence interval
		Absent	Present			
Duration of fever	Less than 5 days	10	8	0.244	1.86	0.677 – 5.108
	More than 5 days	41	61			
Number of diagnostic criteria	Fewer than 5	22	33	0.610	0.828	0.4 – 1.714
	More than 5	29	36			

was observed between CRP and cardiac complications [Table 2].

We also studied the duration of fever and the incidence of coronary artery involvement, where we observed no significant association between the two [Table 3].

## Discussion

In the current study, 120 patients with Kawasaki Disease who included 66 boys and 54 girls were examined. Here, we investigated the cardiac complications created as a result of Kawasaki Disease and examined through echocardiography. Then, these patients were classified into two groups with cardiac complications and without complications. The demographic variables and lab findings were reviewed in both groups, upon which we learned that there were no significant differences. No significant differences were observed between the groups with and without cardiac complications in terms of age, weight, fever duration, number of diagnostic criteria, Platelets, Hb, WBC, Albumin, SGOT and SGPT.

On the other hand, significant differences were observed between the two groups in terms of raised neutrophils, ESR and CRP, such that these lab findings were considerably elevated in patients with cardiac complications.

Upon comparing the current study with Arabi et al, we made the following observations: the sample size of this study was greater, and 86.7% of our patients had abnormal echos, whereas, in Arabi's study, 69% had no signs of cardiac involvement. One reason behind these differences may be the difference in number of patients studied. Moreover, in our study, 59.2% had mitral insufficiency, as opposed to Arabi's study wherein only 10% had this complication. This difference can explain the high percentage of patients with cardiac complications in our study. Mitral insufficiency is a common finding during the acute phase of the disease and usually requires no special intervention, which was taken into consideration in our study. However, in Arabi's study, mitral changes have been examined over a period of 7 years, i.e. progressive mitral insufficiency has been taken into account, thus explaining how the percentage of patients with this complication have reduced in percentage. Our study examined the patients in the acute phase of the disease, while Arabi's study reported the echo results 7 years after treatment. We may thus infer from these findings that timely and appropriate treatment can reduce cardiac complications. Aneurysm was seen in 13% of patients, while in our study 7.5% had developed aneurysms; given the sample size of the two studies, no significant difference was observed between them. Pleural effusion was investigated in both studies; we reported 39.2% and Arabi reported 11%. This statistical difference may be explained by the type and duration of the studies. Our study was a cross-sectional study wherein the echo had been performed during the acute phase of the disease. Conversely, Arabi's study was conducted serially, and the echo results of 7 consecutive years of treatment and follow-up were analyzed.

Eventually, A'rabi Moghadam et al concluded that appropriate treatment with IVIG and aspirin reduces the prevalence of cardiac complications in comparison to treatment with aspirin alone. We could not investigate this issue in our study, as, firstly, it was cross-sectional, and secondly, most of the patients (84.2%) had received this treatment already [9].

Elsewhere, in another study, Karbasi et al examined patients who had fever for more than five days; 39.5% of them had developed cardiac complications, while this figure was 57.5% in our study. This difference may be attributed to the greater sample size of our study, or, that our population had attended the hospital later and had been diagnosed later. In both studies, the percentage of boys affected with KD was higher than the girls [10].

Ram Krishna et al studied the risk factors for cardiac involvement in KD patients and found 21% affected. Since the sample size was much smaller than ours we cannot compare and assess the results with our own. Eventually, lengthy fever and pyuria were known to raise the risk of cardiac disease in KD patients; neither of these two factors have been examined in our study [11]. Akhtar et al investigated the cardiac complications of KD, and observed that 41% of the study population had coronary artery involvement. In the current study, this figure was 57.5%, indicating the consistency of results of both studies. In their study, the patients were again assessed after being treated, where coronary artery involvement had fallen to 8% [12]. Such a comparison was not done in our study. Another study conducted by Gowin et al found that 60% of patients had cardiac complications, and 13.3% had developed coronary artery aneurysms. This study was statistically similar to ours [13]. Narayanan et al studied cardiac involvement in KD patients; 18.5% had coronary artery involvement, whereas, our finding was 42.5%, the difference of which may be attributed to the greater sample size of our study [14].

## Conclusion

As stated earlier, Kawasaki Disease is a multi-system inflammatory disease of unknown origin. It is most common in Asia. One of the characteristics of this disease is vasculitis of small and medium-sized vessels in various organs, with an inclination toward involving coronary vessels. This disease is the most important cause of acquired cardiac disease in children in many countries, including developing countries. Thus, this study was conducted to determine the relevant factors of coronary artery complications in patients with KD over a five-year-period. Subsequently, 120 KD patients were assessed. Significant associations were observed between raised neutrophils, CRP and ESR and cardiac complications in KD. However, no significant associations were observed between gender, age, weight, fever duration, number of diagnostic criteria, Platelets, Hb, WBC, Albumin, SGPT, SGOT, and cardiac complications. The higher the neutrophil count, CRP and ESR levels, the more likely cardiac complications occur. Given the findings of this study, we may conclude that the timely and

accurate examination of laboratory criteria can be a relative predictor of cardiac complications, which, if diagnosed on time and treated appropriately, can be controlled and improved.

### Limitations

There were certain limitations in this study, namely, the use of patients' archived records, which is not devoid of error. The advantage of this study over its similar counterparts is that it covers a 5-year-period and the sample size is greater than most other studies.

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# Effectiveness of positive thinking skills on Life expectancy and self-concept in patients with multiple sclerosis

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## Abstract

Studies have shown that the prevalence of MS disease has an ascending trend. These patients due to the illness have a poor self-image and life expectancy. Accordingly, this study was conducted to determine the effectiveness of positive thinking skills on Life expectancy and self-concept in patients with multiple sclerosis. The research method was experimental and was a pretest-posttest design with a control group. The study sample was composed of 30 female patients with multiple sclerosis under the MS Society in Tehran. In a preliminary study, they had gained a weak score in the Miller's life expectancy (1988) and Beck's self concept questionnaire (1990). The samples, by using simple random sampling method, were divided into two experimental and control groups each of 15 participants. The experimental group, at 8 sessions for 90 minutes (2 sessions per week), received training on positive thinking skills and the control group did not receive any education and treatment. One week after the training session, a Post-test was performed in both groups concurrently, but separately. The results of analysis of covariance showed that positive thinking skills training is effective on enhancement of self-concept and life expectancy in the experimental group ( $p < 0.05$ ). Conclusion: According to the results of this method it can be used to increase self-perception and life expectancy ( $p < 0.05$ ).

**Key words:** hope to life, multiple sclerosis, positive thinking skills, self- perception

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## Introduction

Multiple sclerosis is a chronic, progressive disease of the central nervous system with complications and debilitating symptoms (Sahebalzamani, Zamiri, Rashvand 2012) and 2.5 million people worldwide are suffering from it (Madan, Pakenham, 2014). This disease has the unpredictability of cognition (Soundy et al, 2012), and its prevalence according to the World Health Organization, in order respectively for Europe, the Eastern Mediterranean, America, Ocean quiet West, South East Asia and Africa is 80, 14.9, 8.3, 5, 2.8 and 0.3 people per hundred thousand population (World Health Organization, 2008). Prevalence of the disease still has an increasing bias so that studies show its prevalence has increased from 1.01 in 2008 to 1.32 deaths per hundred thousand population in 2013 (World Health Organization, 2013). The prevalence of multiple sclerosis in Iran based on data from 12 provinces before the 2011, was reported as 41.81 people per hundred thousand population (Shahbeigi et al, 2012), which represents a high rate in Iran. The disease often occurs between the ages of 20-40 years old (Massoud, Mohammad and Ahmad, 2009) and its prevalence in women is two times more than men (Madani et al, 2008).

Early onset of this disease and higher levels of disability from it, causes the patient to be associated with enormous psychological pressure (Beer et al., 2016) among which can be mentioned the incidence of visual disturbances, pain, urinary incontinence and weakness in these patients (Omran et al., 2012) This affects the person's ability to participate effectively in the family and society (Hamidizadeh et al, 2009).

So it is not surprising that these patients, compared to healthy subjects, experience a higher rate of psychological distress (Madan, Pakenham, 2014). Hope is an essential element in chronic diseases that can help in compliance

with the patient's disease (Ghazavi et al., 2015) and living with MS requires continuous adaptation to cope with the unpredictable symptoms (Anderson, Turner & Clyne, 2016). Hope is an important resource for people with MS to cope with multiple lesions of this disease. Mechanisms that hope, through its impact on health, acts through are direct effects and protective effects of stress. In accordance with the mechanism of direct effect, hope to work independently and in accordance with the patient's place is a protective mechanism against stress, and refers to the protective effect of hope against the adverse effects of extreme stress (Madan, Pakenham, 2014). Ironically, people with chronic diseases, often show a low self-concept (Gerhardt, 1989) which is also evident in MS patients (McCabe 2005; Masoodi et al, 2013; Wright & Kiropoulos, 2016). Self-concept is an individual's perception of identity, social skills, physical attractiveness, ethical issues and the adequacy of their working life (Fitts & Warren, 1996).

Several studies in patients with MS, have confirmed the impact of educational interventions on promoting hope (Finucane, 2004; Bagheri et al, 2012; Ghara Zibaei et al, 2013) and self-concept (Masoodi et al 2010; Masoodi et al, 2013) in these patients. One of the educational practices that seems to have a favorable impact of increased life expectancy and self concept, is positive thinking skills. Positive thinking skills, is a teaching method that eventually creates a good description of the individual and the world in which they live. The result of this favorable impression, is a more consistent and better treatment of the individual (Ebadi et al., 2009).

In reviewing databases a study to evaluate the effectiveness of positive thinking skills training on life expectancy and self concept in patients with multiple sclerosis was not found; but the results of some studies have shown that positive thinking skills training to increase the life expectancy of women without husbands (Ebadi et al., 2009) and mothers with children with special needs (Bolghan, Hassan & asghari, 2012) was impressive.

Also, the training has positive effects on enhancement self-concept of families with children of prisoners (Riyadi, Chusna & Harist, 2015) and self-concept of students with learning disabilities (Short, 2007) However, so far it has not been studied in patients with MS. Accordingly, due to the need for improvement in life expectancy and self-concept in patients with MS, this study was conducted to determine the effectiveness of positive thinking skills on Life expectancy and self-concept in patients with multiple sclerosis.

## Methods

### Research design

This study is in the class of quasi-experimental research. The research design of the study is in the form of two groups (experimental and control groups) and includes two pre-tests and post-test. The independent variable was the positive thinking skills training on Life expectancy and self concept in patients, which was applied only in the experimental group, and its effects were compared

in the field of post-test scores of the experimental group compared to the control group.

### Participants

This study population was comprised of female patients with multiple sclerosis who in 2016 were under the MS Society in Tehran. In this study 34 participants (due to risk of loss in the group of participants) who have a low life expectancy and self concept and who had the other criteria for entry into the study, were selected by using random sampling method and they were divided into two groups: experimental (n = 17) and control (n = 17). Inclusion criteria included female gender, education graduates, observed a weak score in the Miller's life expectancy (1988) and Beck's self concept questionnaire (1990), Lack of other physical ailments (such as cardiovascular diseases, cancer, etc.) and other severe psychological disorders (such as major depression, personality disorders, etc.) and a willingness to cooperate. Exclusion criteria were considered as the occurrence of any physical disorders or serious mental issues during the intervention.

### Measurement

#### 1. Life Expectancy Questionnaire (MHS)

Miller's life expectancy (1988) is a diagnostic test. This test consists of forty-eight aspects of the mode of hope and helplessness and the clauses it contained were selected based on open or hidden protests behavior in people with hope or without hope. In every aspect that was representative of the behavior, Sentences were written as follows; 1 = strongly disagree, 2 = disagree, 3 = neutral, agree = 4 And 5 = strongly agree. Total scores showed hope or the lack of hope. In this test, the scores ranged from 48 to 240.

If a person gained a 48 score, they were considered to be quite helpless. A score of 240 indicated the highest hope. Cut-off point was at the score of 100. The validity of the Iranian version of the Miller's questionnaire is obtained with two methods, test-retest and split-half, 0.89 and 0.9 (Gholami & Soudani, 2009). Also this test has a good criterion validity (Hoseinian, 2007; Hoseini, 2006). In this study, the reliability of this instrument was proved by using Cronbach's alpha (0.78).

#### 2. Beck's self concept questionnaire (BSCT)

This test is a self-report measure of the negative attitude to self and has 25 items. At the end of each question there are 5 options that participants will choose one of and thus will be achieved a score between 1 and 5. Scoring in some questions is direct and reversed in others. Scores are added together in the 25 questions and eventually earn a score between 25 and 75. Interpretation of scores is as follows: A score between 25 and 50: is weak negative attitude to oneself, a score between "50 to 75": is the average negative attitude to oneself, Score higher than 75: is strong negative attitude to oneself. Beck (1990), obtained the reliability of the questionnaire using internal consistency at 0.8 and by using retest 0.88 that shows the excellent reliability of this scale. Also its concurrent validity has been reported as 0.55 (Begay, 2015). Examine

construct validity of the questionnaire was reported in the all indicators revealing a score higher than 0.4 and for this questionnaire and Cronbach's alpha coefficient obtained 0.79 (Mollazamani and Fathi-Ashtiani, 2009). Cronbach's alpha was calculated, in the study and was proved at 0.79.

### Methods

After selecting a sample and random assignment of participants in the experimental and control groups, was completed. Life expectancy and self concept questionnaires were completed by patients participating in the study (experimental and control groups). Then training sessions in the field of positive thinking skills were held for the experimental group. The experimental group participated in 8 sessions (2 sessions per week) of positive thinking skills training; at the same time the control group

did not receive any any training and therapy. During the training sessions 2 participants from the the control group withdrew so training sessions continued at 15 patients. A week after the training of positive thinking skills in the the experimental group, post-test was conducted. In order to attain collaboration of the control group, they were promised similar training sessions. A package of the positive thinking skills training was extracted from optimism and positivism book applications (Barati Sade and Sadeghi, 2011). A summary of positive thinking training sessions, is presented in the Appendix.

### Data analysis

In this study as a result of the pretest - posttest, Data were analyzed using descriptive statistics and inferential statistics (analysis of covariance). SPSS 21 software was used for this purpose.

## Results

Information about the individual characteristics of participants are shown in Table 1. The results showed that there was no statistically significant difference between the level of education variables, marital status, age, and duration of the disease affection in both experimental and control groups.

**Table 1: personal and medical characteristics of participants**

Variable	Control group		p	
	Number (percent)	Number (percent)		
education level	Diploma	2 (0.13)	2 (0.13)	0.56*
	Associate Degree	3 (0.20)	4 (0.27)	
	Masters	10 (0.67)	9 (0.60)	
marital status	Single	9 (0.60)	8 (0.53)	0.66*
	Married	6 (0.40)	7 (0.47)	
Age (year)	mean (SD)	32.3±7.2	30.9±8.3	0.42**
duration of the disease affection (year)	mean (SD)	4.83± 4.6	5.21± 3.8	0.33**

Chi-square test, \*\*independent t-test

The descriptive findings related to pre-test and post-test are shown in Table 2 for the dependent variables in the experimental and control groups and the results in Table 2 revealed that scores of experimental group in the the post-test, increased in both variable life expectancy and self concept from the Pre-test.

**Table 2: Mean and standard deviation of life expectancy and self concept scores in the experimental and control groups**

Variable	Examination group		Control group	
	pre- test	Post-test	pre- test	Post-test
life expectancy	6.73± 8.06	69.46± 11.24	58.86± 5.70	54.46±5.55
self concept	32.53 ±5.23	33.73± 5.99	35.26± 7.11	32.00 ±5.94

According to the results presented in Table 3, both assumptions of analysis of covariance means homogeneity of variances and equal error variance-covariance matrix, is proved ( $p>0.05$ ).

**Table 3: Test of Levine and Box to examine the assumption of multivariate regression analysis**

P	Df <sub>2</sub>	Df <sub>1</sub>	F	Variable	Test
0.092	28	1	3.044	life expectancy	Levine Test
0.188	28	1	1.820	self concept	
0.083	14.11	3	2.224	---	Box's M

In Table 4 the Results Of the multivariate analysis of covariance (Wilks Lambda) with regard to life expectancy and self concept are displayed. Between the experimental and control groups in at least one of the the dependent variables (life expectancy and self concept in patients with MS) there is a significant difference ( $P < 0.01$ ;  $F_{2,25} = 11.662$ ; Wilks Lambda = 0.517)

**Table 4: Multivariate analysis of covariance at control pre-test and post-test scores**

Power test	Effect size	Error df	df	F	Value	
0.987	0.482	25	2	11.662**	0.517	Wilks Lambda

\*\* $p < 0/01$

Table 5 shows the results of univariate analysis of covariance in both control and experimental groups after adjustment for pretest scores, displayed for each of the variables life expectancy and self concept. The results show that by eliminating the effect of pre-test variable, it has been estimated between scores of the Life expectancy ( $p < 0.01$ ) and self concept ( $p < 0.05$ ) there is a significant difference in terms of membership.

**Table 5: univariate analysis of covariance after adjustment for pre-test scores**

Power test	Effect size	F	Mean Square	df	Sum of square	dependent variables
0.994	0.442	21.382**	1446.458	1	1446.458	life expectancy
0.625	0.180	5.945*	96.896	1	96.896	self concept

\* $p < 0/05$ ; \*\* $p < 0/01$

Thus, according to the mean difference in Table 2 and the results reported in Table 5, it can be concluded that positive thinking skills training increased life expectancy and self concept in patients with MS.

## Discussion

The findings showed that positive thinking skills training can significantly enhance the *Life expectancy and self concept* among patients with multiple sclerosis. The same research findings support the results obtained in this study, so that the findings have revealed that *positive thinking skills* in depressed women's life expectancy can be increased (Saman Moghadam, 2015); as there can be a decrease in marital disputes among couples (Ashraf Hafez et al., 2012) and improved life expectancy among women with no spouse (Ebadi et al., 2009) and in accordance with the findings of this study, female patients with MS, learning these skills an increase in life expectancy is effective.

In order to explain the findings of the results obtained in some of the research attention is given *Training optimism* in the people's adherence to self-care behaviors (Jaser,

2014). *Enhancement well-being and decrease depression* (Boiler et al, 2013), *Enhancement optimism* and health behaviors (Terrace, 2013) is impressive. These findings are among the reasons that justify the effect of training on positive thinking to enhance life expectancy in patients with MS.

Contrary to Groopman (2005) where Passive character to hope is considered a placebo, Schneider (1994) argues that hope is an active feature that includes purpose, power planning and determination to achieve the goal, according to the purpose and the ability to overcome their obstacles and as Tracy (2013) has shown it can be influenced by positive-thinking people. These findings suggest that Positive thinking skills in the MS patients and *Positive thinking* can improve their well-being and through increased belief in their ability, promote hope in these patients.

Also the findings of the study, on effectiveness of positive thinking skills was confirmed on the *Imagine yourself* in patients with MS. Although empirical studies have not been conducted directly in the field, the findings of some studies indirectly, from results of this study protect as Tsvilskaya & Artemyeva (2016) And Morea, Friend & Bennett (2008) have shown, optimism of people is among the factors that have a significant impact on the people's self concept.

In other words if people have a positive view of the future, this shows at a higher level as confidence and higher self-esteem (Hannell, 2012) and it is consequently expected that People also have higher self concept which in study was proven. To explain these findings, it can be noted that comments of Bray (2001) in the field of indirect relationship between optimism at self concept the positive consequences of behavior can be shown in the the sense of pride and self-confidence created, while success is attributed to external factors such as chance, luck or help attributed by others and does not lead to a feeling of pride and positive self-concept. According to this, and in accordance with the theoretical foundations it can be expected that patients with MS have a higher amount of positive thinking, and reported higher self-esteem due to *Imagine being controlled by external events* as the results of this study showed leads to higher self concept in these patients.

Also one of limitations of the present study was for members of the control group who had no sessions or replacement therapy. Therefore, there may be active mechanisms associated with the experience of the group (such as acceptance by the group) and the therapist, (such as empathy) or other elements influencing the treatment plan (including the effects from positive expectations from treatment) that are not included in the results. Other limitations of this research, was lack of follow-up period due to time constraints, which is recommended in future research to be used to assess the continuing follow-up from treatment outcomes.

## Conclusion

According to the results of this study, it seems positive thinking skills training has a positive impact in improving life expectancy and self concept in patients in general and patients with multiple sclerosis in particular. So considering that this training, is Non-invasive and is a low-cost intervention, it would be in line with the role of advisers, psychologists and doctors active in MS Society and other independent groups, to be used.

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# The relationship between prolonged sitting position and adaptive alterations in lumbar spine and pelvic range of motion in cyclists with chronic low back pain

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## Abstract

**Background:** The majority of low back pain (LBP) problems in athletes are the result of stress induced by prolonged postures or repeated movements. Cycling is a sport that needs prolonged trunk flexion during the activity.

**Objective:** To compare sagittal lumbar spine and sagittal pelvic tilt range of motion (ROM) between athletes with CLBP (chronic low back pain) who regularly ride bicycles and healthy controls without regular bicycle riding.

**Methods:** Nineteen cyclists with CLBP and 20 asymptomatic non-cyclist athletes participated in the study, (mean age: 26.00±8.67 years). Sagittal lumbar spine and sagittal pelvic tilt range of motion (ROM) were measured during forward bending and backward return clinical tests using a three-dimensional motion capture system.

**Results:** During forward bending, cyclists with CLBP demonstrated a limited anterior pelvic tilt angle ( $p = 0.03$ ), compared to non-cyclists athletes. No significant differences were found in lumbar flexion angle between the groups during the test. During Backward return, cyclists with CLBP exhibited a limited posterior pelvic tilt angle ( $p = 0.02$ ) and lumbar

extension range ( $p = 0.05$ ), compared to non-cyclist athletes.

**Conclusions:** A regular sitting position on the bicycle for a prolonged period may result in adaptations in sagittal lumbar and pelvic ROM which may contribute to the development of LBP.

**Key words:** Low back pain; Cycling; Prolonged posture; Lumbar; Pelvic, Range of motion

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## Introduction

A large number of low back pain (LBP) problems in athletes are as a consequence of movement demands on the hip and the lumbopelvic regions during repetitive performed sport activities(1-4).

It has been proposed that regular participation in activities which require prolonged postures and repeated movements can increase tissue stress and microtrauma, and eventually develop movement impairment syndromes (kinesiopathological model)(5). Despite the higher prevalence of LBP from prolonged postures or repeated movements in athletes, there are relatively little research literature to investigate this type of LBP (6, 7).

One way to identify the effects of prolonged trunk flexion on spinal kinematics and the development of LBP is to examine lumbar and pelvic range of motion (ROM) in cyclists with LBP. Cyclists spend much time riding their bicycle in a prolonged trunk flexion position and this position may be associated with the development of LBP (8-10). Muyor et al. found that cyclists demonstrated significantly greater lumbar flexion during bending forward and on the bicycle when compared with non-athletes (11). In another study of cycling, Van Hoof et al. compared lower lumbar ROM in cyclists with LBP to asymptomatic controls. They suggest that cyclists with CLBP ride with a greater lower lumbar flexion which is associated with an increase in pain (10).

In most previous research studies regarding the relationship between prolonged cycling and lumbopelvic kinematics in cyclists, spinal kinematics were analyzed in prolonged, flexed-spine position during cycling (10, 12-14). However, the examination of individuals using standardized clinical tests helps to identify the movement impairments and the factors that contribute to the presence of a dysfunction (5). Assessment of the lumbar spine and pelvic contributions to forward bending and backward return are basic clinical examination tests in people with LBP (5, 15-17). Therefore, the current study was conducted because sports-related LBP problems associated with prolonged postures and repeated movements have not been extensively analyzed in previous research studies. This study focused on cycling to examine lumbar and pelvic mobility in cyclists who sit on a bicycle for prolonged periods. To our knowledge, no previous study has measured the lumbar spine and pelvic ROM during forward bending and backward return clinical tests in cyclists with LBP. The purpose of this study was to compare athletes with CLBP (chronic low back pain) who regularly ride a bicycle with healthy controls without regular bicycle riding, regarding lumbar spine and pelvic ROM during standardized forward bending and backward return clinical tests. We hypothesized that repetitive flexion demands which are imposed on pelvic and lumbar regions contribute to impairments in the magnitude of lumbar and pelvic motion and eventually lead to LBP.

## Methods

### Participants

Nineteen cyclists with CLBP and 20 asymptomatic non-cyclist athletes (soccer: 11, badminton: 5, and running: 4), between the ages of 18 and 60 (mean age:  $26.00 \pm 8.67$  years), were included in this cross-sectional study. The cyclists with CLBP reported that they rode in a trunk flexion position for at least one-year (minimum of two times per week)(3, 5) and had suffered from LBP in the past 12 months (18). All cyclists with LBP attributed their symptoms to riding a bicycle. Healthy subjects did not have LBP experiences in the past 12 months. People were excluded from this study if they had a history of spinal surgery, any spinal deformity, serious spinal diseases (e.g. cancer, infection), systemic diseases and current pregnancy. The groups were matched for participant personal characteristics (Table 1). Patients were referred from physicians and healthy subjects were called through an advertisement and friends of the participants. All participants read and signed an informed consent form approved by the Human Studies Committee of Iran University of Medical Sciences before participating in the study.

### Laboratory Measures

Prior to any laboratory test, participants completed the following questionnaires: (1) demographic and sport activity questionnaires, (2) questionnaire about LBP history, and (3) the numeric pain rating scale questionnaire (19). Afterwards, kinematic data were recorded during the tests of forward bending and backward return in standing position. The subject performed forward bending and backward return tests as far as possible at an individual preference speed. A 6-camera motion capture system (Qualisys AB, Sweden) was used to track the 3-dimensional marker positions. The sampling frequency of kinematic data capturing was 100 HZ. The dynamic resolution of the capturing volume was greater than 1 mm. Reflective skin markers were placed 7cm to the side of the spinous process of the 3rd lumbar vertebra, corners of the 1st sacral vertebra, highest point of the iliac crest, greater trochanter, posterior aspect of the middle of the femur, medial and lateral knee joint line, lateral malleolus, bilaterally, and two markers on spinous process of the 1st and 5th lumbar vertebra. Calibration was performed before the data acquisition. All laboratory measures were conducted in the Movement Science Laboratory in Physical Therapy Department at Iran University of Medical Sciences.

### Data Processing

The lumbar segment local coordinates were reconstructed using the marker on the spinous process of the 1st lumbar vertebra, the marker on the spinous process of the 5th lumbar vertebra and the two markers on the 7cm to the side of the spinous process of the 3rd lumbar vertebra. The knee medial and lateral markers, and the greater trochanter and femur markers were used to define femur local coordinate system. The pelvic area was defined by the markers on the iliac crests and corners of the 1st sacral vertebra. The tibia was defined using the lateral malleolus and the medial and lateral knee joint line markers. Firstly, three-dimensional

positions of the markers were gap filled and filtered. A robust spline smoothing algorithm (20) was used for filling the gaps. Next, the output was filtered using a second order bidirectional low pass Butterworth filter with the cutoff frequency of 10 Hz. Three-dimensional kinematics were extracted using the Euler-Cardan approach programmed in MATLAB software (The MathWorks, Inc., Natick, Massachusetts, USA). The X-Y-Z Cardan sequence was used to find the transformation matrix from global to a local coordinate system (to find limb angles), and from local to another local coordinate system (to find joint angles). We used an iterative process to determine the start and termination of each movement. For each test, the main and dependent movements were plotted against time. The start and end points were identified using threshold criteria of angular velocity and displacement. The times at which angular velocity goes above and comes back below 10 percent of the peak velocity were considered as the movement's start and end, respectively. The peak velocity was considered as the maximum velocity of the first bell-shaped velocity movement in the direction of the movement under consideration. The iterative process was used to control the start time for searching for the

movement start and end and also used to visually confirm the accurate detection. At an accurate start point, the angle-time plot should have a consistent slope change. This iterative process was also carried out using a custom-made MATLAB program. Sagittal lumbar spine and sagittal pelvic tilt ROM at the termination of forward bending and backward return tests were calculated as kinematic variables of interest.

### Statistics

The statistical software SPSS 16.0.0 (SPSS Inc. Chicago, IL, USA) was used for all data analyses. Categorical data are reported as number (percentage). Continuous variables are presented as mean±SD. The Shapiro-Wilk's test was used to examine the normality assumption of quantitative variables. For testing hypothesis about difference of means between the 2 groups, continuous variables were compared using either the t-test (normal distribution) or the Mann-Whitney test (non-normal distribution). Independent samples t-test was applied to examine the differences in pelvic and lumbar ROM between the two groups (cyclists and non-cyclists). A P value ≤ 0.05 was considered as statistically significant.

## Results

There were no differences between cyclists with CLBP and asymptomatic non-cyclists in age, Height, Weight and BMI (Table 1).

Characteristics	Cyclists with LBP (n=19)	Control group (n=20)	P-value
Age (y)	26.48±8.13 (range 18-53)	25.55±9.22 (range 18-60)	0.51
Height (cm)	176.83±7.61	175.47±7.48	0.58
Weight (kg)	75.11±11.84	69.68±10.96	0.15
BMI (kg/m <sup>2</sup> )	23.99±3.32	22.54±2.58	0.14
VAS (0-10)	5.94±1.89	NA	NA

Data are expressed as mean±SD.  
Note: Low back pain: LBP; BMI: Body Mass Index; VAS: visual analog scale.

### Forward bending

Compared to athletes without LBP, cyclists with LBP demonstrated a restriction in anterior pelvic tilt angle ( $p = 0.03$ ) in forward bending test. There were no statistically significant differences between groups in magnitude of lumbar flexion ( $p = 0.06$ ) during forward bending test (Table 2).

	Cyclists with LBP (n=19)	Control group (n=20)	P-value
<b>Forward bending test</b>			
Maximal anterior pelvic tilt angle (degree)	45.70 (1.88)	50.99 (1.48)	0.03
Maximal lumbar flexion angle (degree)	81.40 (2.85)	87.68 (1.60)	0.06
<b>Backward return test</b>			
Maximal posterior pelvic tilt angle (degree)	45.66 (2.02)	51.86 (1.68)	0.02
Maximal lumbar extension angle (degree)	81.86 (3.03)	88.86 (1.86)	0.05

Data are expressed as mean (SE) .  
Note: Low back pain: LBP.

## Backward return

Compared to athletes without LBP, cyclists with LBP demonstrated a restriction in posterior pelvic tilt angle ( $p = 0.02$ ) and lumbar extension range ( $p = 0.05$ ) in backward return test (Table 2).

## Discussion

The purpose of the current study was to examine lumbar spine and pelvic ROM between athletes with CLBP who regularly ride a bicycle and healthy controls without regular bicycle riding during forward bending and backward return clinical tests. People with CLBP who regularly ride a bicycle demonstrated a restriction in end-range anterior pelvic tilt angle during forward bending and also in end-range lumbar flexion and posterior pelvic tilt angles during backward return. There were no significant differences between the two groups with respect to end-range lumbar flexion angle during forward bending.

During the forward bending test, the restriction of anterior pelvic tilt which was observed in cyclists with CLBP might be due to the fact that the key alignment producing their symptoms is bending forward. Therefore, the cyclists with CLBP tended to restrict the motion of anterior pelvic tilt as a result of pain during the forward bending test. Another explanation for this finding is attributed to the possible shortness of hamstring muscles in cyclists with LBP. Previous research studies indicate that there is a relationship between lack of sufficient hamstring muscle length and the decrease in anterior pelvic tilt motion during maximal trunk flexion with extended knees (21-24). During backward return test, the restriction in the end-range lumbar extension and posterior pelvic tilt angles in cyclists with LBP might be as a result of prolonged trunk forward flexion posture on the bicycle. This posture is suggested to associate with an adaptive decrease in lumbar lordosis (9, 11, 25) and also an adaptive anterior pelvic inclination (9, 26), which in turn, leads to a decrease in end-range lumbar and pelvic motions during the test.

Other studies have evaluated the effects of repetitive motions and prolonged postures on lumbopelvic kinematics in athletes. Our results are in agreement with most previous studies in which it is suggested that regular participation in sport activities, which is associated with prolonged postures and repeated movements, may contribute to kinematic alterations of lumbar and pelvic regions and the development of LBP (3, 10, 27, 28). Muyor et al. (26) compared maximal lumbar flexion of cyclists and non-athlete individuals. Lumbar flexion angle was measured during maximal trunk flexion in seated position on the floor and while sitting on the bicycle. They found that cyclists demonstrated an increased anterior pelvic tilt compared to non-athlete individuals. However, no significant differences were found between cyclists and non-cyclists in lumbar flexion except in the case of lower handlebar heights. Results regarding lumbar flexion angle in the current study are in agreement with the Muyor et al.(26) study, in which they reported that cyclists were not significantly different in lumbar flexion angle when compared to non-athletes.

However, some results of our study are in disagreement with the Muyor et al.(26) study which suggested an increased anterior pelvic tilt in cyclists compared to non-cyclists. This difference may be due to the fact that the current study included cyclists with LBP but the participants in the Muyor et al.(26) study were healthy individuals.

Van Dillen et al. (4) conducted a study to examine differences between people with LBP who participated in symmetric, with those who participated in asymmetric sport activities. The authors found that the movement impairments which were identified on clinical examination may be associated with the types of specific repetitive demands in which the athlete is involved. Our findings are in agreement with Van Dillen et al.(4) and those previous studies which support the kinesiopathological model in that prolonged postures and repeated movements contribute to kinematic alterations associated with the development of LBP.

The present study can be criticized in that it is not clear whether the differences in the magnitude of pelvic and lumbar motions were related to the LBP condition, the flexion demand or both. In addition, it is unknown whether cyclists developed LBP as a result of the decreased pelvic and lumbar motions, or the decreased pelvic and lumbar motions are a result of the LBP problem. These limitations are due to the study design, a cross-sectional study in which the data gathering was performed over a short period of time. Another potential limitation of our study is that it is unknown whether the results of the present study are generalizable to females. Future studies are required to understand whether the same is true for females. The reason why our participants were limited to men was the gender differences in movement patterns and ROM (29-31).

We recommend further studies with other clinical movement tests to obtain more information on the relationship between repetitive rotation demands and movement impairments.

## Conclusion

The results of this study suggested that a decrease in the magnitude of end-range pelvic and lumbar motion during backward return test might be associated with prolonged, flexed-spine position during cycling in cyclists with LBP. These results further supported the kinesiopathological model. The limited anterior pelvic tilt ROM which was observed in cyclists with LBP might be related to the moving toward painful direction in forward bending test. An awareness of contributing factors in the kinematic alterations and the development of LBP might be important to direct clinical examination and injury prevention in cyclists who regularly participate in cycling tasks.

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# Risk Factors of Suicide Attempt in Tabriz, Iran

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## Abstract

**Objective:** Suicide is among the main problems in society and is caused by many factors. These factors are different between developed and developing countries. This research was performed to investigate the epidemiological data related to patients who attempted suicide by poisoning in Tabriz, north west Iran.

**Materials and Methods:** Throughout a four-month period, 300 self-poisoned patients (168 females and 132 males) referring to Sina educational hospital in Tabriz, were evaluated by a general psychiatrist and psychologist through interview and filling out a questionnaire.

**Results:** The most common precipitating factor was family conflict followed by psychiatric disorder and unemployment. Medical illnesses, in particular physical handicaps, substance abuse, and other psychosocial stressors were also effective factors.

**Conclusion:** Precipitating and clinical risk factors associated with suicide attempts in Iran resemble those described in literature, but with a few variations.

**Key words:** Suicide, drug poisoning, suicide attempt, Iran

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## Introduction

Suicide is a major public health problem and is defined as a purposeful action of an individual who intends to terminate one's own life. According to the World Health Organization (WHO) in the year 2000, approximately one million people died from suicide, and 10 to 20 times more people attempted suicide worldwide (3). There are some differences in suicide and suicide risk factors between developed and developing countries (3,18). In Iran, the lifelong prevalence of suicide attempt is 1.4% (14).

Suicide attempters are thought to be heterogeneous with complicated psychosocial and psychiatric conditions influenced by cultural factors (8).

Suicidal behavior is determined by a number of factors. These can be classified under the terms of predisposing factors and precipitating factors. Predisposing factors are internal determinants such as gender, age, and mental illness. Precipitating factors deal with external or environmental influences upon the individual including unemployment, physical illness or disability and family history of suicide (8,21).

Iran is a Middle East country with Islamic culture, which strongly prohibits suicide. From religious and socio-cultural view points, suicide is considered as a shameful act. Stigma associated with suicide makes it difficult to collect data accurately. Consequently, numbers of attempted or completed suicides may be underestimated. Suicide attempt is a known potent risk factor for completed suicide and predicts subsequent serious acts. Therefore, study of attempted suicide could have benefit for better prevention and diagnosis (5, 6, 22).

The objectives of this study were to describe the subject characteristics and clinical features of suicide attempters in Tabriz and to examine the precipitating risk factors before attempting suicide.

## Materials and Method

Our sample comprised 300 people who had attempted suicide and who had been sent to the emergency room in Sina general hospital in Tabriz, during a four-month period (May-September).

There are three general hospitals with emergency rooms in Tabriz, north east of Iran, and only one of them offers emergency psychiatric services. To the best of our knowledge, during the period of data collection, most suicidal patients in Tabriz were sent to one of these three local general hospitals.

After giving informed consent, precipitants were asked to fill out two forms. One was a demographic questionnaire about sex, age, education level, job, marital status, and history of previous suicide attempts both in the patient and in his/her first degree relative or his/her friends. The other was a precipitating stressors checklist to assess any precipitating factor related to suicide including family relationship problems, psychiatric disorder, unemployment, other relationship problems, substance abuse, chronic physical illness, occupational stress, academic stress, hopelessness, financial stress, death of a close friend or relative, couple relationship problem. One internist examined patients to rule out general medical conditions. A general psychiatrist interviewed the patients. Diagnosis was made based on the criteria of Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV).

The data were analyzed by descriptive statistics using SPSS Version 11.

## Results

There was a higher proportion of females (56%) than males (44%) (168 vs.132). The most common used suicide methods were poisoning by medication such as Amitriptyline, Phenobarbital, Diazepam, and fluoxetine (76.3%), followed by organophosphate poisoning (23.7%). Table 1 shows the frequency of gender type, mean age of the subjects, marital status, level of education, frequency of suicide attempts, and the occupation of the patients. Only two cases had a family history of suicide and three cases had past history of suicide in their close friends. The most common precipitating stressors for suicide attempts in our sample were family relationship problems (72.7%) followed by psychiatric disorder (35.3), unemployment (24.6%), other relationship problem (10 %), substance abuse (8%), chronic physical illness (6%), occupational stress (4.5%), academic stress (2.7%), hopelessness (3.3), financial stress (1.7%), death of close friends or relatives (1.7%), and couple relationship problems (0.7%).

**Table 1: Characteristics of patients who attempted suicide**

Variable		Number	Percent
Sex	Female	168	56
	Male	132	44
Marital status	Single	143	47.7
	Married	148	49.9
	Divorced or widow	9	3
Month	May 22- June 21	17	5.7
	June 23- July 22	130	43.3
	July 23- August 22	84	28
	August 23- Sept 23	69	23
Job	Unemployed	53	15.9
	Simple worker	96	32
	Student	26	8.7
	Governmental	19	6.3
	Housewife	106	35.3
Education level	Illiterate	18	6
	Primary & Secondary school	183	61
	High school	80	26.7
	Academic	19	6.3
Number of Previous Attempts	1	243	82.3
	2	33	11
	3	7	2.3
	4	7	2.3
	5	2	0.7
	6	3	1
	7	1	0.3
	8	3	1
	9	1	0.3

## Discussion

The present study surveyed the clinical characteristics and precipitating risk factors of suicide in an emergency room. The results revealed that suicide attempt rate among women is higher than among men (56% vs 44%). This confirms both earlier and recent reports of increased risk of attempted suicide associated with the female sex (6, 7, 16). In most countries men have a higher reported rate of completed suicide, whereas women have a higher rate of attempted suicide (6, 14).

In this study, 74% of the suicides occurred between the ages of 10 and 29 years. This has also been demonstrated by other studies on suicide attempts (10). High rate of impulsivity in adolescents' suicidal behavior (90%) may be a good explanation for it (12).

Our data showed higher suicide rates for married persons than those who were never married (157 vs 143). This is against other studies in the west that consider marriage as a protective factor (16) although it is consistent with previous studies in developing countries (9, 10, 11, 13, 17, 20). One of the explanations is that in developing countries,

marriage appears to be a significant source of stress (especially for women), leading to suicidal behaviors. One study in Hong Kong suggested that responsibility and increase of work load in married life are reasons for high female suicide (23).

We found that 17.7% of those attempting suicide had a history of an earlier attempt. This supports other articles that pointed out that a previous suicide attempt is a strong predictor of future suicide (5,6, 15,20,22).

Most of the males attempting suicides were simple workers or unemployed. The majority of our female patients were housewives and financially non-productive. These results highlight that lack of a job and major financial setbacks, which often lead to debt traps, are major reasons for suicide in these groups (4,17,19).

In this study, family conflict was one of the highest precipitating stressors. As mentioned in other evidence, a healthy relationship among family members have been identified as a protective factor and family conflict is considered as a risk factor (1, 3, 7).

The majority of suicide attempts occur in the context of psychiatric disorders (5, 8). Yamada et al. reported that 81% of suicide attempt cases had an axis I diagnosis. He suggested that the treatment of psychiatric disorders is a basic prevention for suicide (22). In our sample, psychiatric disorders were reported in 35.3% of participants. Other psychosocial stressors and risk factors were relationship problems, academic stress, and hopelessness. These are consistent with other studies (5, 7). Lack of self esteem and problem solving skills in the context of psychiatric disorders may predispose a person to suicide when faced with these stresses.

There are some limitations that should be considered. Firstly, our sample is restricted to one province; therefore, the result could not be generalized to other areas of the country. Secondly, we performed an unstructured interview. Thus, the prevalence rate of psychiatric disorders was probably underestimated. This is somewhat inevitable due to the nature of our sample. Nevertheless, the results of this study identify areas for further focused research.

## Conclusion

Precipitating and clinical risk factors associated with suicide attempts in Iran resemble those described in literature, but with a few variations. Supportive intervention for many modifiable risk factors seems plausible. In addition, life skill training might be considered as a prevention program.

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# Comparison of the Effects of Religious Cognitive Behavioral Therapy (RCBT), Cognitive Behavioral Therapy (CBT), and Sertraline on Depression in Patients after Coronary Artery Bypass Graft Surgery: a Randomized Controlled Trial

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## Abstract

**Background:** We compared the effectiveness of Religious Cognitive Behavioral Therapy (RCBT), Cognitive Behavioral Therapy (CBT), and Sertraline on Depression in Patients after Coronary Artery Bypass Graft Surgery.

**Method:** This was a randomized controlled trial with parallel groups. A total of 160 participants were randomly assigned to 4 groups of 40 including 3 intervention groups (RCBT, CBT, and sertraline) and 1 control group (usual care). Depression was assessed before and after interventions, and at 6 month follow-up.

**Results:** The three intervention groups had significant differences in decreased depression compared to the control group from pretest to posttest and from pretest to follow-up ( $P < 0.0001$ ). There was no significant difference between the three intervention groups (RCBT, CBT and sertraline) on decreased depression.

**Conclusions:** Our results showed that RCBT, CBT and sertraline had a similar effect in reducing the symptoms of depression in the study population after the intervention and follow-up. However, these interventions were more effective than in the control group. Further trials in this area are necessary.

**Key words:** Religious Cognitive Behavioral Therapy, Cognitive Behavioral Therapy, Sertraline, Depression, CABG

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## Introduction

Depression is one of the important factors for the development of coronary artery disease (1). In different studies bidirectional interactions between depression and ischemic heart disease have been documented (2). In this regard studies have shown that patients with heart disease have a greater chance of developing depression (3) and statistics suggest that 30-40% of patients undergoing cardiac surgery (CABG) suffer from depression (4). High levels of depression may expose patients to an increased risk of recurrence of cardiac events (5) and rehospitalization (6). In the psychiatric approach, various pharmacological and non-pharmacological therapies are used to treat psychological problems. In this regard, the use of Selective serotonin reuptake inhibitors (SSRIs) drugs such as Sertraline in the treatment of depression as an effective drug (7-8), with a good and safe tolerance level for cardiac patients was reported. (9). On the other hand, some studies have suggested psychological treatments, especially CBT, as reasonable alternatives to pharmacological therapy (10) and the effectiveness of this type of intervention was reported to reduce the symptoms of anxiety and depression in cardiac patients (11-13) and post-operative CABG surgery patients (14-15). However, lack of adequate evidence, limitation of previous studies, and non-generalization of outcomes to support the use of CBT, led to the need for a large randomized controlled trial (16) with long-term follow-up in this group of patients (17). In addition to using other psychological treatments, the efficiency of religion has also recently been considered as a cure for diseases and other stressors, and religion is used to strengthen positive emotions and help neutralize negative emotions. (18). Although studies have confirmed the effectiveness of non-pharmacological treatments with religious approach and cognitive-behavioral therapies along with religious intervention in reducing depression (24-19), this relationship and effectiveness were not reported in some other studies (25 -30) and empirical studies are also limited in this regard (31).

On the other hand, studies to compare the efficacy of RCBT and CBT have presented different results. As in some studies reported, CCBT and RCBT had a similar effect (20, 22, 32) and in some, RCBT was more effective than CCBT (33). In addition, a study also found that RCBT was not more effective than SCBT, but greater effectiveness of RCBT in reducing depression symptoms was shown in individuals who were more religious, where more extensive studies are needed (22). Also, in a review study, evidence reveals that both psychotherapeutic treatment and pharmacologic treatment are safe and effective in reducing depression severity in patients with cardiovascular disease (34). Regarding limited studies with long-term follow-up and contradiction in the effectiveness of interventions, a study was conducted to compare the effects of RCBT, CBT and sertraline on depression in patients post CABG surgery.

## Materials and Methods

The study protocol has been previously published in detail (35). The study protocol was approved by the Behavioral Research Center of Mazandaran University of Medical Sciences (ID: 2013-12-04) and the Ethics Committee of the Research Deputy of Mazandaran University of Medical Sciences (ID: 92192). Moreover, all principles of the 2008 Declaration of Helsinki were observed during the design of the study. A randomized controlled trial design with parallel groups were adopted to compare the effects of RCBT, CBT, sertraline, and usual care on post-CABG depression in patients admitted to Tuba Clinic, Sari, northern Iran.

The inclusion criteria were participants with age  $\leq 65$  years, having undergone first-time CABG surgery (four weeks after surgery), and having received follow-up treatment in Tuba Clinic, fluency in Farsi, a junior high school degree or higher level of education, willingness to participate and providing written consent, meeting the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria for depression(36), scoring  $\geq 8$  for depression on the Persian version of the Hospital Anxiety and Depression Scale (HADS)(37), and being religious (based on self-reports)(20).

The exclusion criteria were a history of psychiatric disorders like schizophrenia, bipolar disorder, and serious suicidal thoughts confirmed by clinical interviews, performed by a psychiatrist based on the DSM-IV, scoring  $\geq 14$  HADS, a history of any physical condition preventing the patients from participating in treatment sessions, a history of attending RCBT, CBT, or any other kind of psychotherapy programs, and having used sertraline or other anti-depressant during the two-week period prior to the study. A researcher evaluated the records of participants who had undergone CABG in Tuba Clinic and selected them on the basis of the inclusion and exclusion criteria discussed. The selected participants were called and briefed on the project. Those who declared their willingness to participate during the phone call (oral consent) were requested to visit the clinic for baseline evaluations. If the participants agreed to participate, they were asked to sign an informed consent form in the clinic. During their visit, the subjects were asked if they regard themselves as religious persons (Yes/No). Individuals who provided positive answers were asked to complete the Persian version of Golriz and Baraheni's Religious Attitude Questionnaire (38). The participants were included only if they scored over 25 in the above mentioned questionnaire. Then the presence of depression symptoms was determined by the HADS scale. Individuals with HADS scores  $\geq 8$  were referred to a psychiatrist for a clinical interview based on the DSM-IV. Subjects with a number of mental disorders were excluded and referred to a psychiatrist to receive relevant treatment. The participants were evaluated at baseline, immediately after the interventions, and six months after the interventions in the same clinic.

### Sample size and sampling

Based on previous studies(39) and considering the  $\alpha = 5\%$ , test power of 80%, and probable 20% sample loss, 160 people were selected (40 in each group).

### Randomization

Participants were randomized using block randomization, stratified by age (<57/>57) and gender (male/female), were adopted to assign the participants to one of the three intervention groups (RCBT + usual care, CBT + usual care, sertraline + usual care), and one control group (usual care). The participants were informed about their treatment groups after randomization. Owing to the nature of the study, blinding was not possible. However, the statistician was not informed about patient groups.

### Measures

The following measures were used to collect information: The demographic and clinical information form was used. The religious attitude scale introduced by Golriz and Baraheni was used. The validity of this scale was 80%, as has been determined using the correlation coefficient of Allport–Vernon–Lindzey. Also, the reliability of the scale was 0.85(38).

The Hospital Anxiety Depression Scale (HADS) was developed by Zigmond and Snaith (1983) (40); Montazeri et al. (2003) confirmed the validity and reliability of this scale in Iran. The internal consistency of the scale was obtained with Cronbach's alpha for depression at 0.86(37).

The clinical interview (DSM-IV) was used for clinical diagnoses previously described in the protocol of this study (35).

**Intervention:** After the random allocation of the participants, RCBT and CBT groups attended 12 one-hour weekly sessions of therapy (41). The pharmacological intervention group took 25–200 mg sertraline every evening for three months. The dose of the medicine was determined, as based on the physician's prescription. Sertraline was provided in the form of 50 and 100 mg pills by Abidi Pharmaceutical Co., Iran (licensed by Iran's Ministry of Health). The participants in the control group did not undergo any intervention and only received normal care, including physical care, medication, incision care (chest and leg), dietary recommendations, activities, and periodic visits after CABG surgery. All participants received biweekly follow-up phone calls from the research assistant. Patients with symptoms that worsened were excluded and referred to a psychiatrist for further treatment (based on ethical considerations). The RCBT and CBT intervention sessions has also been earlier discussed in detail (35). Post-tests were assessed after intervention and six months later (after follow up).

**Statistical analysis:** Statistical analysis was performed using SPSS version 20. Chi-square and Fischer's exact tests were used to compare the demographic and clinical variables with the qualitative characteristics. The Kolmogrov-Smirnov test was used to evaluate the normal

distribution of quantitative variables. One-way ANOVA was used in cases where data distribution was normal and the Kruskal-Wallis (non-parametric) test was used in cases where data distribution was not normal. In both cases, if differences were observed between groups, LSD was used for parametric data and Mann-Whitney's U test was used for non-parametric data. In order to analyze the depression score at different times, the GEE (Generalized Estimating Equation) test was used in four groups. Spearman correlations were used to examine the relationship between variables with regard to the nature of abnormalities of variables.

**Ethics:** Before the initiation of the study, participants were explained about the study objectives, the need for taking blood samples, and their right to withdraw at any stage. They were also ensured about the safety of the interventions and confidentiality of data. The required permissions were obtained from The Ethics Committee of Research Deputy of Mazandaran University of Medical Sciences and the relevant authorities at Tuba Clinic.

## Results

The flow of participants from the beginning to the end of the trial is summarized in Figure 1.

Also, demographic characteristics of participants are given in Table 1 (page 36). There were no significant differences between the groups in terms of demographic features, clinical characteristic and religious attitudes at baseline of the study.

The average HADS score for the experimental and control groups were respectively RCBT9.08 (SD = 2.86), CBT8.30 (SD = 2.96), Sertraline 9.40 (SD = 2.70) and the control group 8.80 (SD = 3.04) points. There was no statistically significant difference between the four groups at baseline ( $P = 0.279$ ) (Table 1).

The mean of depression scores in the RCBT group was 9.08 before intervention, which decreased by 2.53 points to 6.55, and in the follow-up phase, it decreased to 0.35 after intervention. The follow-up score difference was 0.66 from before intervention. The CBT group had a mean depression score of 8.30 before intervention, which reduced to 6.90 after intervention, and in the follow-up phase, there was a decrease of 0.08, and the mean reached 6.82. The reduction from before intervention to follow-up was 1.84. The results in the sertraline group showed that before intervention, the mean depression score was 9/40, and with a decrease of 0.97 it reached a score of 8.43 after intervention and in the follow-up phase. The reduction was 0.93 compared to after intervention, and it decreased by 1.90 compared to before intervention. In the control group, before intervention, the mean score was 8.80, which increased by 1.55 after intervention and at the follow-up stage, there was an increase of 1.55 compared to before intervention, so that, after intervention there was an increase compared to before intervention (Figure 2).

Figure 1: Flow of participants through the Study

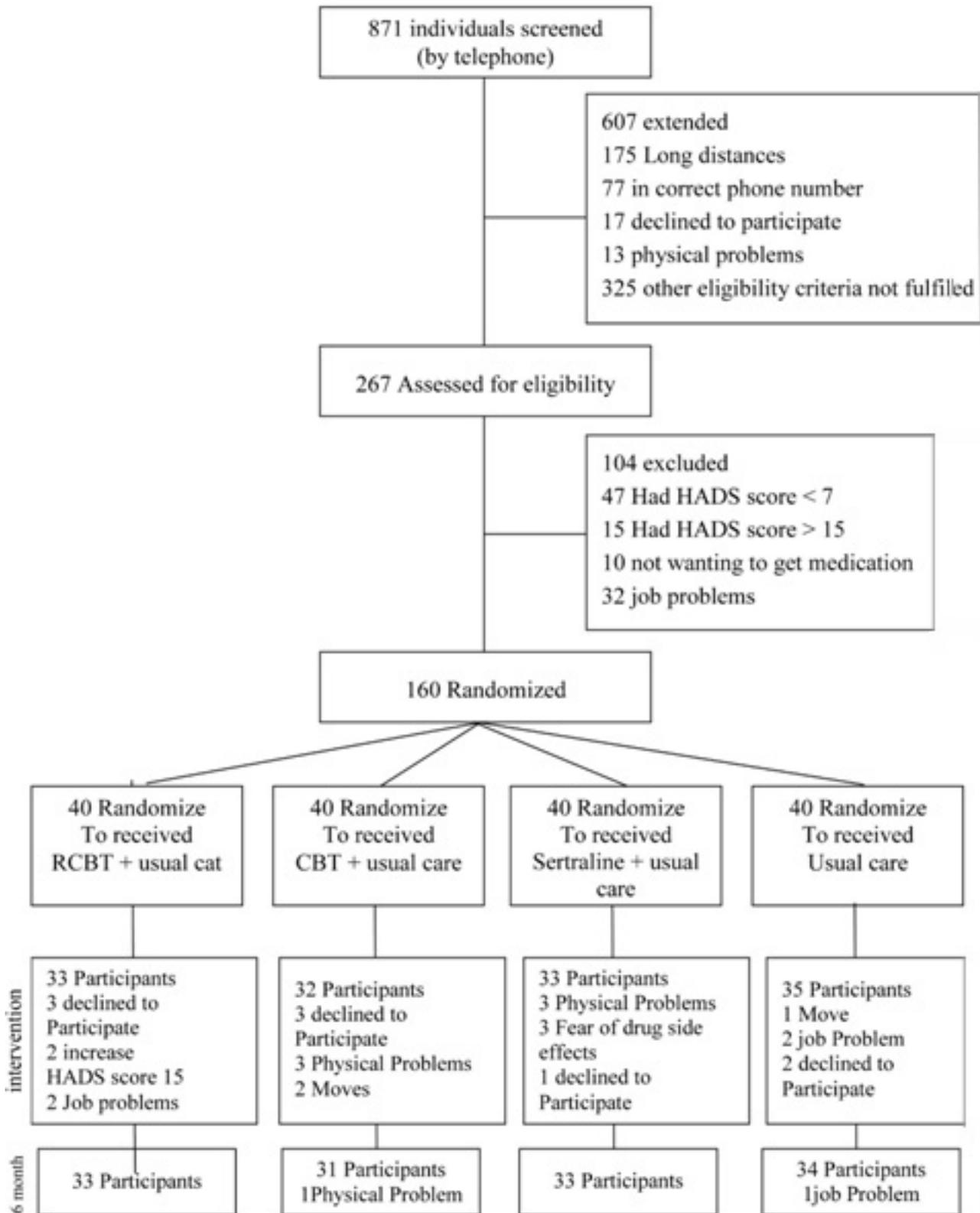


Table1: Demographic and baseline clinical data

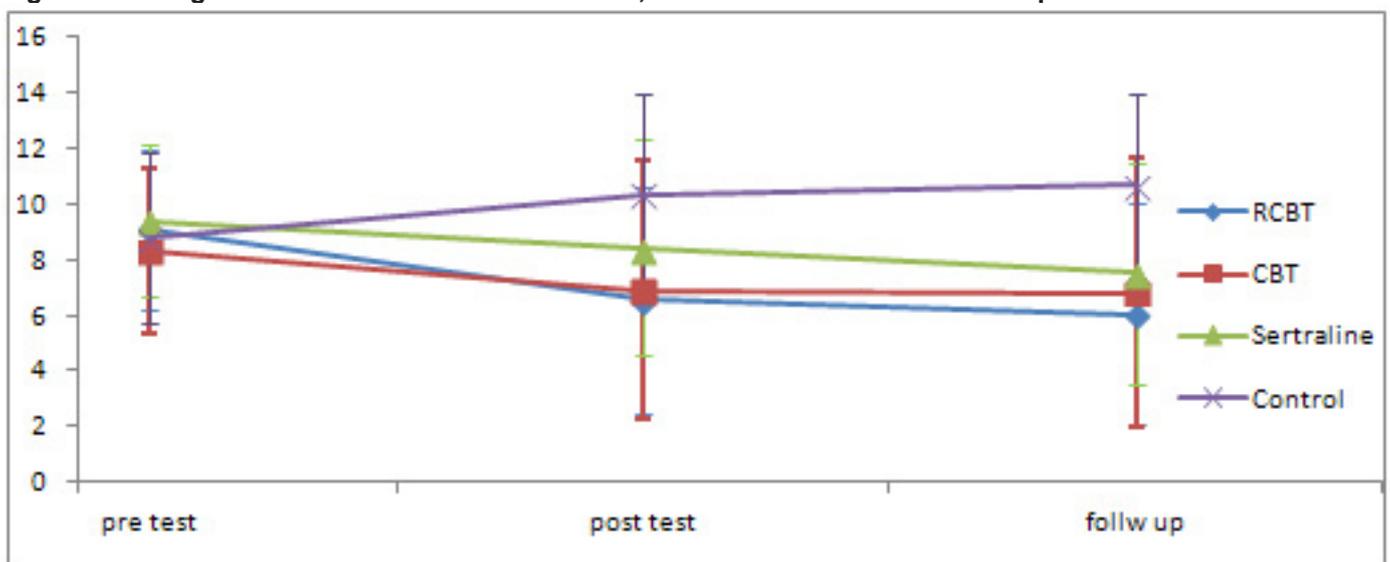
Variables		RCBT n=40	CBT n=40	Sertraline n=40	Control n=40	Total N=160	P-value
Sex n (%)	Male	22(55.0)	25(62.5)	23(57.5)	21(52.5)	91(56.9)	** .827
	Female	18(45.0)	15(37.5)	17(42.5)	19(47.5)	69(43.1)	
Job status n (%)	Employed	8(20.0)	10(25.0)	10(25.0)	11(27.5)	39(24.4)	.648*
	Retired	19(47.5)	16(40.0)	14(35.0)	11(27.5)	60(37.5)	
	Housekeeper	13(32.5)	13(32.5)	14(35.0)	18(45.0)	58(36.3)	
	Unemployed	0(0.0)	1(2.5)	2(5.0)	0(0.0)	3(1.9)	
(% ) Education n	< Diploma	32(80.0)	35(87.5)	39(97.5)	34(85.0)	140(87.5)	.085*
	> Diploma	8(20.0)	5(12.5)	1(2.5)	6(15.0)	20(12.5)	
Age group n (%)	<57	15(37.5)	20(50.0)	20(50.0)	21(52.5)	76(47.5)	.531**
	> 57	25(62.5)	20(50.0)	20(50.0)	19 (47.5)	84(52.5)	
Age	mean(std)	57.25(7.25)	56.20(6.63)	56.78(5.89)	57.48(5.16)	56.93(.494)	.684***
Religious attitude	mean(std)	72.33(13.15)	74.08(11.68)	70.47(11.18)	71.03(10.73)	71.98(.925)	.105***
Underlying disease n (%)	Yes	27(67.5)	30(75.0)	26(65.0)	30(75.0)	113(70.6)	.674**
	No	13(32.5)	10(25.0)	14(35.0)	10(25.0)	47(29.4)	
Hypertension n (%)	Yes	22(55.0)	26(65.0)	25(62.5)	23(57.5)	96(60.0)	.791**
	No	18(45.0)	14(35.0)	15(37.5)	17(42.5)	64(40.0)	
Diabetes n (%)	Yes	33(82.5)	26(65.0)	26(65.0)	25(62.5)	110(68.8)	.189**
	No	7(17.5)	14(35.0)	14(35.0)	15(37.5)	50(31.3)	
Hypercholesterolemia n(%)	Yes	34(85.0)	37(92.5)	30(75.0)	29(72.5)	130(81.3)	.069*
	No	6(15.0)	3(7.5)	10(25.0)	11(27.5)	30(18.8)	
Other n (%)	Yes	32(80.0)	36(90.0)	33(82.5)	34(85.0)	135(84.4)	.703*
	No	8(20.0)	4(10.0)	7(17.5)	6(15.0)	25(15.6)	
Duration of heart disease (year) n(%)	1-5	30(75.0)	32(80.0)	33(82.5)	32(80.0)	127(79.4)	.184*
	5-10	5(12.5)	3(7.5)	4(10.0)	4(10.0)	16(10.0)	
	10-15	1(2.5)	0(0.0)	2(5.0)	4(10.0)	7(4.4)	
	<15	4(10.0)	5(12.5)	1(2.5)	0(0.0)	10(6.3)	
NyHA class n (%)	Class1	18(45.0)	21(52.5)	16(40.0)	18(45.0)	73(45.6)	.905*
	Class2	21(52.5)	17(42.5)	23(57.5)	20(50.0)	81(50.6)	
	Class3	1(2.5)	2(5.0)	1(2.5)	2(5.0)	6(3.8)	
	Class4	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	
Number of vessels involved n (%)	one	4(10.0)	5(12.5)	3(7.5)	5(12.5)	17(10.6)	.786*
	two	6(15.0)	4(10.0)	6(15.0)	9(22.5)	25(6.3)	
	three	30(75.0)	31(77.5)	31(77.5)	26(65.0)	118(73.8)	
Percentage of veins involved n (%)	<70	3(7.5)	4(10.0)	11(27.5)	3(7.5)	21(13.1)	.119**
	70-80	13(32.5)	11(27.5)	10(25.0)	10(25.0)	44(27.5)	
	80-90	15(37.5)	9 (22.5)	10(25.0)	14(35.0)	48 (30.0)	
	90-100	9(22.5)	16(40.0)	9(22.5)	13 (32.5)	47(29.4)	
Depression (HADS)	mean(std)	9.08(2.86)	8.30(2.96)	9.40(2.70)	8.80(3.04)	8.89(2.89)	.279

\* Fisher's Exact

\*\* Chi square

\*\*\*Kruskal-Wallis (k-w)

Figure 2: Changes in HADS scores at the baseline, after intervention and follow-up



The results also showed that both the effect of the group and the effect of time produced a significant difference during the study on the level of depression in patients ( $P < 0.0001$ ) (Table 2).

**Table 2: GEE analysis of outcome variables**

Variables	B	SE	95% Wald CI	Wald x2	df	P
Group(RCBT) <sup>a</sup>	-.298	.0809	-.457 to -.140	13.573	1	<.0001
Group(CBT) <sup>a</sup>	-.283	.0887	-.457 to -.109	10.199	1	.002
Group(Sertraline) <sup>a</sup>	-.163	.0665	-.294 to -.033	6.029	1	.041
Time(3Th) <sup>b</sup>	-.162	.0428	-.246 to -.078	14.362	1	<.0001
Time(2Th) <sup>b</sup>	-.120	.0395	-.197 to -.042	9.152	1	.002

a. Reference group, the control group.

b. Reference group, time (1st).

The results showed that RCBT, CBT and Sertraline groups had no significant difference in decreasing depression before intervention compared to post intervention :RCBT and CCBT ( $p=0/468$ ), RCBT and Sertraline ( $P=0/124$ ), CCBT and Sertraline ( $p=0/416$ ). However, the three intervention groups had significant differences on reducing depression compared to the control group after intervention ( $P < 0.0001$ ). In the follow-up phase, the three intervention groups did not differ significantly in depression compared to before intervention. In the follow-up phase, RCBT and CBT did not differ compared to before intervention. There was no significant difference between the sertraline group ( $p = 0.346$ ), RCBT group and sertraline with CBT group ( $p = 0.564$ ). But there were significant differences between the three intervention groups with the control group before intervention ( $P < 0.0001$ ).

There was a significant difference in the follow-up stage between the intervention groups. There was no significant difference between the RCBT and CBT groups ( $p = 0.316$ ) and between the RCBT and sertraline ( $p = 0.414$ ), but there was a difference between the CBT with Sertraline ( $p = 0.014$ ), with control ( $p = 0.027$ ), RCBT group with control ( $p = 0.001$ ) and control with sertraline ( $p < 0.0001$ ).

The results within groups showed that there was significant difference between RCBT ( $P < 0.0001$ ), CBT, Sertraline, and control groups ( $p = 0.001$ ) before intervention to after intervention and in the pretest to follow-up. There was a growing trend of depression score in the control group and a decreasing trend was observed in the treatment groups. The decrease in RCBT in the time intervals of before intervention to after intervention ( $p < 0.0001$ ), before intervention to follow-up ( $p < 0.0001$ ) and after intervention to follow-up ( $P = 0.002$ ) were significant.

The decreasing trend in CBT was significant after intervention ( $P = 0.020$ ), and the decrease in follow-up was also significant ( $p = 0.017$ ), but in this group, the decrease was not significant in the follow-up ( $p = 0.814$ ).

In the Sertraline group, the level of depression decreased during the time, but the level of decrease was not significant in the after intervention ( $p = 0.170$ ), but in the follow-up phase, the changes were significant compared to before intervention ( $0.0001$ )  $p$ ) and after intervention ( $p = 0.1010$ ).

The control group, after intervention ( $p < 0.0001$ ) and follow-up ( $p = 0.001$ ) showed significant increases. However, the incremental changes in the follow-up were not significant compared to after intervention ( $p = 0.991$ ) (Table 3).

**Table 3: Comparison of training gains in outcome variables by group.**

Variable	RCBT	CBT	Sertraline	Control	k-w test	Post hoc*
T2-T1	-2.53(3.50)	-1.40(3.86)	-.97(4.55)	1.55(2.90)	<.0001	4<2,3,1
T3-T1	-3.05(3.48)	-1.47(3.95)	-1.90(4.75)	1.85(2.95)	<.0001	4<2,3,1
T3-T2	-.53(1.09)	-.08(2.04)	-.93(1.23)	.30(1.14)	<.0001	4<1,3 4<1,2 4<2<3
Wald x2	<.0001	.001	.001	.001		
Post hoc**	T1>T2>T3	T1>T3,T2	T1>T2>T3	T1>T3,T2		

\*Mann-Whitney U

\*\* Isd

## Discussion

This is the first randomized controlled trial which compared the effect of RCBT, CBT and sertraline on postoperative depression in post-operative patients (CABG) with a follow-up period of 6 months after intervention. The first hypothesis of this study was that the RCBT intervention was more effective than CBT in patients after coronary artery bypass graft surgery. The results of our study showed the same effect of interventions immediately after treatment and follow-up, and there was no significant difference between the two treatments in reducing depression symptoms. Perhaps, one of the reasons why we cannot find the difference between the effectiveness of RCBT and CBT in this study was that the therapeutic content was substantially similar in RCBT and CBT. However, RCBT treatment interventions followed the same CCBT process, with the exception that it used religious beliefs and motivations to stimulate change in thought, behavior, and counteraction to irrational thoughts (18). The patients used their religious teachings and practices to help change beliefs, values and behaviors. These two interventions in our study resulted in a similar outcome in reducing depression in patients who underwent CABG surgery. In addition, this finding showed that the effect of RCBT was not lower than CBT.

The results of some studies were inconsistent with our findings regarding the effectiveness of RCBT intervention in comparison with CBT (21, 33, 42). Azhar (1995) compared two methods of psychotherapy with and without religious perspective on depressed patients and showed that in the religious psycho-therapeutic group, depression symptoms were associated with a faster recovery in the first 3 months after intervention (21).

Razili et al. (1998) also showed that the treatment method was more effective in decreasing the anxiety and depression symptoms of patients, by adding a religious and socio-cultural component to the patient's psychotherapy program and comparing it with standard treatment (42). Koenig et al. (2016) also examined the effects of RCBT versus CCBT on therapeutic alliance and the results showed preference for RCBT therapeutic intervention (33). In another study by Azhar (1995), a comparative study was conducted on patients suffering bereavement. In this study, two methods of psychotherapy with religious views and standard therapies were compared. The results showed a tendency for recovery in more religious patients with grief and bereavement. The individuals who received religious psychotherapy with cognitive-behavioral approach recovered faster (43).

Concerning the same effect of RCBT and CBT, some studies were consistent with our study (20, 22-23, 44-45). In a clinical trial study of the effectiveness of spirituality integrated psychotherapy (SIPT) and CBT in patients with depressive disorder, the results of comparing two therapeutic interventions showed no significant difference in the reduction of depression symptoms in patients (45). Daher et al. (2016) compared religious-cognitive-behavioral therapy with CCBT on purpose in life (PIL) in patients with

major depression and chronic illness. The results showed that RCBT had no more efficacy than CCBT on purpose in life and both treatments had the same effect (22). Lim et al. (2014) also conducted a systematic review of the effectiveness of religiously modified CBT to standard CBT or other treatment modalities for the treatment of depressive disorders, general anxiety disorder, and schizophrenia of religious-CBT with standard CBT for depression, general anxiety and schizophrenia. The results showed no difference between the effectiveness of religiously modified CBT to standard CBT or other methods. However, combining religious content with CBT may be considered a suitable treatment for people with strong religious beliefs (44).

Koenig et al. (2015) also compared the effectiveness of religious-cognitive-behavioral therapy (RCBT) with standard cognitive-behavioral therapy (SCBT) regarding the increased optimism in MDD patients and chronic medical conditions. The results showed that RCBT and SCBT had similar effects on the increased optimism in MDD patients, and increased optimism in turn led to a decrease in depressive symptoms (20).

In another study, two RCBT methods were compared with CCBT on increasing the daily spiritual experience (DSE) in patients having physical problems with depressive disorder. The baseline DSE and its changes were evaluated as predictors of change in depressive symptoms. The results showed an increase in DSE and decreased depression in both treatment groups (23). The second hypothesis examined the effectiveness of RCBT intervention regarding sertraline on depression in patients after coronary artery bypass graft surgery. The results showed that RCBT and sertraline had similar effects in decreasing depression and there was no significant difference between the two therapeutic methods. Although the effect of RCT treatment on depression was not lower in this study, more research is needed to find an appropriate response to the efficacy of this therapeutic approach. In this regard, the results of some opposite studies (45) and some consistent (44) studies have been reported.

Ebrahimi et al. (2013) compared spiritual integrated psychotherapy (SIPT) with the pharmacological methods in patients with depression. The results showed that in contrast to the results of the present study, SIPT had higher effects on depression symptoms compared to the antidepressant after intervention and follow-up (45).

The results of a systematic review on the comparison of RCBT and other therapeutic methods, including drug therapies in the treatment of depression disorders, did not show any significant difference in the reduction of depression among treatment groups, which is consistent with the results of this study (44). Therefore, considering the patients' desire to receive treatment for decreasing depression, the treatment method is proportional to the satisfaction (preference) of patients. In this regard, the results of a meta-analysis showed that approximately 75% of participants preferred the treatment of psychologists to drugs, in reducing depression and anxiety disorders (46).

The third hypothesis of this study investigated the effectiveness of RCBT, CBT and Sertraline interactions with conventional therapy on depression in patients after coronary artery bypass graft surgery. Our results showed that RCBT significantly had a greater effect on depression symptoms than the control group immediately after intervention and follow-up, and these results were consistent with other studies (45, 47-48).

A meta-analysis study clearly demonstrated that religious spiritual intervention (RSI) is associated with a significant improvement in depression even with different models, and the results between the intervention and control groups were compared before and after the intervention (47).

In another study by Rahimi et al. (2015), the effectiveness of integrated spiritual-cognitive-behavioral group therapy was investigated by using the Islamic mysticism approach on depression, feelings of guilt and loneliness. The results indicated the effectiveness of this intervention in significantly reducing emotional problems (Depression, feeling of guilt and loneliness) in the experimental group compared to the control group (48).

Ebrahimi et al. (2013) reported the efficacy of SIPT in comparison with the usual treatment for decreasing the severity of depressive symptoms in patients with depressive disorder in post-test and follow-up ( $P < 0.01$ ) (45). The results of this study also showed that CBT treatment intervention was significantly more effective in decreasing depression symptoms than the control group (routine treatment) immediately after intervention and in the follow-up, and these results were similar to other studies (49-50). Hynninen et al. (2010) examined the efficacy of cognitive-behavioral therapy (CBT) in patients with COPD, clinical anxiety and depression. The results indicated a rapid reduction in anxiety and depression symptoms in the CBT group compared to the control group (49). Doering et al. (2016) also examined the effect of CBT intervention on depression in patients undergoing cardiac surgery. The results not only showed a decrease in depression in patients undergoing CBT intervention in comparison with the usual treatment group, but also other benefits after surgery, such as improved perceived control and improved coping skills related to pain and pain relief in patients (50). In this study, CBT was effective in reducing depression with continuity of patients in comparison with the usual treatment in after intervention and follow-up periods.

In a critical review of psychosocial interventions and pharmacological therapies, Wolf et al. (2008) stated that the results generally showed comparable efficacy of psychotherapy and pharmacological therapies, while both methods were superior to treating depression compared to conventional methods (51).

Regardless of the positive findings in this study, some limitations may affect the interpretation of findings and their generalizability. Among these, our study only considered patients with mild to moderate depression. It seems that patients with severe depression should be considered to better understand the efficacy of RCBT in comparison

with other pharmacological and non-pharmacological therapies. Also, this therapeutic comparator was exclusively specific to patients after the CABG operation, so that the generalizability of its results on other depressed patients with physical problems should be done with caution. The limited number of treatment sessions was one of the other limitations of this study. Continuation of more treatment sessions could provide more effective and lasting treatment responses. Another limitation of this study was the lack of similar studies in patients after CABG surgery, which resulted in comparing RCBT, CBT and drug methods in other patient groups.

This study also has many strengths. First, in order to compare the effectiveness of interventions, in addition to comparing intervention groups with each other, the control group was compared with them. Second, for the exact determination of depression symptoms, clinical interview (DSM-IV) and HADS tool were used. However, by considering the religious beliefs and attitudes in our society, religious beliefs and motivations were used to stimulate the change of thoughts and counteract irrational thoughts in a researcher-made package of RCBT therapy to reduce depression.

## Conclusion

It was assumed that RCBT would have a greater impact on depression in this group of patients compared to CBT and drug therapy (sertraline). The results of this randomized controlled trial indicated that RCBT, CBT and sertraline had a similar effect in reducing the symptoms of depression in the study population after the intervention and follow-up period. However, these interventions were more effective than the control group. Considering the cultural and religious beliefs in our society, it seems that by integrating religion in cognitive-behavioral therapy, especially in religious subjects, it can be considered as an effective factor in coping and treating the psychological problems of patients, as with other non-pharmacological methods. Further trials in this area are necessary.

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# The Effectiveness of Cognitive-Existential Group Therapy on Reducing Demoralization in the Elderly

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## Abstract

**Introduction and Objective:** Elderly people face existential issues such as death, loss of meaning in life, fear of death, lack of life and last chances. If people, cannot effectively confront it, this loss of meaning in life, will form the main core of a set of syndromes that are called "demoralization". This study aims to investigate the effectiveness of cognitive-existential therapy on reducing demoralization in the elderly.

**Method:** The present study was carried out using a pretest-posttest semi-experimental design with control group and random assignment. The statistical population included all the elderly women in Yas Daily Rehabilitation Center. In this study, 22 people were selected through non-random sampling and after answering the demoralization scale (Kissane, 2004) and Cognitive Distortions Questionnaire (Abdollahzade et al. 2010 quoted from Farmani-Shahreza et al. 2016) they were randomly assigned to experimental and control groups (each group included 11 people). The experimental group participated in 12 cognitive-emotional group therapy sessions (each session 90 minutes) once a week, but the control group did not receive any intervention. The collected data were processed using SPSS-20 software to calculate covariance analysis.

**Results:** The results showed a significant reduction in the demoralization and cognitive distortions compared to the pretest. Also, in a two month follow-up session, demoralization and cognitive distortion scores were significantly reduced compared to pretest.

**Conclusion:** Cognitive existential group therapy on the one hand, due to addressing the existential issues of the elderly, and, on the other hand, working with their irrational beliefs and replacing rational beliefs, can have an effect on reducing of the demoralization syndrome in the elderly.

**Key words:** cognitive-existential group therapy, demoralization, cognitive distortions, the elderly

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## Introduction

Elderly refers to a stage of life which occurs following biological, biochemical and anatomical changes in body cells. The changes generally begin after age 60 and affect gradually body cell functions. Being elderly isn't an illness but a natural evolution which can't be stopped or reversed (World Health Organization, 2001).

Iran is a country with a large aging population. About 8.3 percent of population was over 60 in 2012 (Iran, 2012). According to statistics, nearly 10 million elderly people are expected by 2022, which means approximately 10 percent of Iran's population in that time (Darani, Abedi, & Riji, 2009).

Elderly people may confront difficulties in different dimensions such as severe financial constraints, physical disabilities or existential conflicts. In the physical dimension they may face problems such as: 1- chronic illnesses (blood pressure, cardiovascular disease and diabetes) 2- progressive vision and hearing loss 3- neurological and psychiatric disorders such as Dementia, Alzheimers and Depression (Duberstein, Pálsson, Waern, & Skoog, 2008).

Socio-economic problems which old age people suffer from, include financial problems, losing job and social status, death and loss of friends, peers and loved ones (Wurtman, 1993). Isolation due to physical weakness and diminished mobility is also reported (Mussen, Conger, Kagan, & Houston, 2002).

The other dimension, with regard to psychological problems that older people suffer from include: Loneliness (Alpass & Neville, 2003; Heravi Karimloo et al., 2008; Wurtman, 1993), impatience, anger, absurdity, anxiety, insomnia and fatigue (Kaldi, Ali Akbari, & Foroghan, 2004).

Aging can trigger existential distress which recalls fear of death. Seeing friends and peer groups getting cancer or cardiovascular disease reminds them that they have stepped into the final stages of life. Elderly people are aware of their limited time but they have much unfinished business. This makes them change their life style but also can give rise to conscious feelings of fear and anxiety (Vincent, 2003).

According to existential approach, we face existential concerns such as death, isolation, meaninglessness, responsibility and freedom during our lives. The human search for foundational supporting structures for existence deals with deeper levels of anxiety. Although every human being needs to be immortal, stable and have a role model to follow, all of us confront existential concerns such as death, absurdness and isolation (Yalom, 1980).

Even though existential distress is a normal reaction to the concept of inexistency as a consequence of consciousness, if the person fails in coping efficiently with existential crisis, it may cause distress and demoralization (Blinderman & Cherny, 2005; Leung & Esplen, 2010).

The starting point of demoralization syndrome is a sense of incompetency and inefficiency in dealing with a debilitating situation which leads to some fundamental questions. If the person fails in finding proper answers to these questions, he/she might end up with demoralization syndrome. Therefore, the most specific feature of demoralization syndrome is failure in adding value and meaning to life (D. W. Kissane, Clarke, & Street, 2001).

Kissane and Clarke (2001) considered demoralization as a psychiatric diagnosis for existential suffering and suggested diagnostic criteria as following: 1- hopelessness, loss of meaning and purpose in life 2- pessimistic attitudes and thoughts, helplessness, feeling trapped and failed, lack of a worthwhile future 3-lack of motivation for coping differently 4- social isolation and feelings of losing support 5- symptoms persistence for more than two weeks 6- The symptoms are not attributable to major depression or another psychiatric disorders.

Kissane(2011)believesthatdespitesomephenomenological similarities between depression and demoralization syndrome, these two concepts are basically different.

A depressed person is not satisfied with his past, not pleased with his present and also disappointed about the future and even when the course of action is clear he may not be able to experience overall pleasure and is not motivated enough to persist steadfastly in pursuing the task and experience pervasive anhedonia. While a person with demoralization syndrome does not have serious problem with his past. Although he/she might be able to experience pleasure at the moment, due to the confusion (not knowing what to do and what he can do), practically he feels helpless, inadequate, suppressed and experiences anticipatory anhedonia and he sees future as worthless (Clarke & Kissane, 2002).

Beside aging hardships, elderly people might face existential concerns such as death, loss, absurdness, meaninglessness and regret of missed opportunities. They might face challenges to make meaning in their lives (Yalom, 1980). If they cannot find a genuine answer to their existential issues they will suffer pathological anxiety.

One of the important dimensions of demoralization syndrome is cognitive distortion in finding meaning. The demoralized have negative and black and white thoughts about events and have self-contempt, exaggeration, and low self-confidence (Watson & Kissane, 2011). Since demoralization syndrome consists of emotional, cognitive and behavioral components, it seems that any intervention to decreasing its symptoms should cover cognitive components which are effective in forming new thoughts and meaning.

A range of psychological interventions have been used to reduce the psychological problems of the elderly, which indicates the need for psychological services for these elderly people. This range includes: cognitive-behavioral therapies (Hedayat, 2015; Barghi Irani, 2015), existential group therapy (Mooziri, 2013), spirituality-based cognitive therapy (Rahimi, 2014), group logo therapy (Poorebrahim,

2006; Fakhar, 2007, Yazdan Bakhsh, 2015); memory telling (Majzoubi, 2012), hope therapy (Parvaneh, 2015) and cognitive-existential therapy (Barekati & Bahmani, 2017). The literature indicates that existential group therapy and group logo therapy were not effective on the elderly (Mooziri, 2013; Poorebrahim, 2007; Fakhar, 2007).

Furthermore, the focus of most interventions for the elderly has been on the treatment of death anxiety, feelings of loneliness, depression, and enhancement of life expectancy, happiness, self-efficacy, mental health, quality of life and quality of sleep in the elderly. It seems essential to address the anxieties because of their prevalence while less attention has been paid to demoralization in the elderly.

It would be beneficial to find the most effective and practical intervention method to reduce the demoralization subsequent to aging due to the need to respect the human rights of the elderly and also to save time, effort and facilities. In cognitive-existential group therapy, it aims to use techniques of "cognitive therapy" to refine some schemas, negative automatic thoughts, and to correct the cognitive errors that contribute to the formation of psychological distress caused by the non-genuine response to existential anxiety. Moreover, this method pays attention to existential concerns such as death anxiety, uncertainty, meaninglessness, loneliness, and uncontrollability of the world that are intensified by the death threat in patients. In most intervention methods such concerns do not receive systematic attention. Therefore, it is expected that through this intervention, individuals will find their own unknown fears and conflicts over the issues of existence and will be able to cope with them in a genuine and effective way (Bahmani, 2010). Previous studies indicate that cognitive-existential therapy plays an effective role in reducing psychological distress in different populations (Bahmani, 2010; Naghyiaee, 2014, Farmani Shahreza, 2014; Paknia, 2015). In this regard, we seek to investigate the impact of this intervention on the elderly and to answer the question of "whether cognitive-existential group therapy can reduce demoralization in the elderly?"

## Method

The study was carried out using a pretest-post-test semi-experimental design with control group and random assignment. The statistical population included all the elderly women in Yas Daily Rehabilitation Center. The sample included 22 people selected through a non-random sampling from among the elderly present in the center during the sampling period (spring 2017) who were prepared to participate in the group therapy and who were eligible for inclusion criteria. The sample was divided into experimental and control groups in a random assignment (11 individuals in each group).

In this research, the dependent variable is measured before and after the presentation of the independent variable, and its design graph is as follows:

Experimental Group	G <sub>1</sub>	T <sub>1</sub>	X	T <sub>2</sub>	T <sub>3</sub>
Control Group	G <sub>2</sub>	T <sub>4</sub>	-	T <sub>5</sub>	T <sub>6</sub>

T<sub>1</sub> and T<sub>4</sub> represent the pretest, T<sub>2</sub> and T<sub>5</sub> the posttest, T<sub>3</sub> and T<sub>6</sub> show the follow-up and X is the Cognitive-Existential Group Therapy.

## Instruments

In this research, Demoralization scale syndrome was used to measure demoralization. Demoralization Scale (DS) is a 24-item scale and contains 5 subscales including meaninglessness, helplessness, feeling failure, disheartened and dysphoria. An alpha coefficient for the DS scale was reported as 94%. The Persian version of the scale was translated and administered by Bahmani and Naghyiaee (2014) among women with breast cancer and its alpha coefficient was reported as 86%. In order to measure cognitive distortions, the 20-item scale of Cognitive Distortions developed by Hassan Abdollahzadeh and Maryam Salar (2010) was used. The standardized Cronbach's alpha was 80%.

## Procedure

After preliminary studies and preparation of the protocol, and receiving a referral letter from the University of Welfare and Rehabilitation Sciences to the Welfare Organization of Tehran province, we got the necessary permissions and referred to the Yas Daily Rehabilitation Center. The research process began after permission was gained from the head of the Center. First, through broadcasting announcements and talks with the elderly in the Yas Daily Rehabilitation Center, they were informed of the study. Subsequently, after describing the research goals and obtaining consent from the elderly and observing the ethical rules, the conditions for the participation in the research were prepared. After interviewing from the individuals completing demoralization and Cognitive Distortions questionnaires, 22 elderly were selected according to inclusion and exclusion criteria and randomly assigned to the control and experimental groups. The inclusion criteria were: age of 60 and over, having the ability to speak, having no cognitive problems and a score of over 30 in the Demoralization scale. Exclusion criteria included: having mind and brain disorders such as Parkinson's and dementia, having any psychiatric disorders based on the written contents of their file in the center and use of any psychotherapy and counseling services at the time of the research.

Subsequently, cognitive-existential group therapy was performed for 12 sessions of 90 minutes and once a week for the experimental group (Table 1), while the control group received no intervention. In order to observe ethical issues, after group treatment with the experimental group, group therapy was also performed for the control group.

At the last session, the mentioned questionnaires were repeated on the participants of both groups. In order to ensure the durability of the therapeutic results, two months after the completion of the group therapy in the follow

**Table 1: the protocol for cognitive-existential group therapy**

Sessions	Objectives
First	Setting goals and defining the process of cognitive-existential group therapy Explaining the outline of the sessions that are essential for creating group atmosphere in the sessions
Second	Continuation of the work for the desirable establishment of the group's forming traditions: accountability for themselves and others Introduction to the concept of existential anxiety and its difference from neurotic anxiety
Third	Investigating the concept of death anxiety and the related cognitive distortions
Forth	Helping to accept loneliness as a genuine experience to increase the desire and motivation for being with others and family members
Fifth	Challenging false beliefs about loneliness and social isolation, feelings of rejection, dependency, feelings of uselessness, hopelessness, fear of death and dying
Sixth	Helping the individuals to face the consequences of not accepting responsibility and ignoring the principle of freedom and choice
Seventh	Helping to reduce the fear of dependency and the sense of uselessness and hopelessness as sources of anxiety
Eighth	Challenging the concept of losing meaning in life Helping the elderly to find effective meaning and be free of cognitive distortions
Ninth	Continuing the process of reviewing goals and establishing new directions in life
Tenth	Facilitating continuous and consistent commitment to work in order to achieve new goals
Eleventh	Wrap-up session
Twelfth	Expressing the feelings of the participants about the group therapy Coordination for the follow-up meeting Post test

up phase, the participants again were assessed using questionnaires.

Data from pretest and posttest was entered in version 20 of SPSS software. After analyzing the assumptions of covariance analysis, this statistical method was used to analyze the data. Covariance analysis limits or eliminates the effect of the pretest variable and measures it using the regression equation. Among the important assumptions of this statistical method was the homogeneity of variances using Levene's test and Normality test by Kolmogorov–Smirnov test. These assumptions were checked and verified in the study.

The ethical considerations of this study included the following topics: 1) the participants in the research were assured that the information received would be confidential; 2) scores were given to those who would like to know their scores; 3) the planning of group counseling sessions was carried out in a way that would not interfere with the programs of the Yas Daily Rehabilitation Center; 4) The control group was assured that they would participate in

eight sessions of Cognitive-Existential group therapy after the end of the research; 5) Any of the participants could freely leave the program at any time during the research.

## Results

The sample consisted of 22 elderly women with an average age of 69 who were randomly assigned into two groups of 11 in experimental and control groups (waiting list). According to the results of the Mann-Whitney U test, the two groups were homogeneous in demographic variables of age and education. In addition, the assumptions of the covariance test for the normality of the data distribution were confirmed by Kolmogorov-Smirnov test and homogeneity of variances were confirmed by Levin's test of two groups in dependent variables of demoralization and cognitive distortions.

In Table 2, the comparison of mean scores in the pretest, posttest and the two-month follow up of the experimental group showed that the scores in the posttest and follow-up were reduced compared to the pretest.

Table 3: Mean and standard deviation of cognitive distortion scores in pretest, posttest and follow up

Variable	Test stage	Experimental group		Control group	
		Mean	standard deviation	Mean	standard deviation
Cognitive distortions	Pretest	55/09	3/91	52	4/28
	Posttest	75/63	4/86	55/36	3/29
	Follow up	72/09	7/11	52/90	3/83

In Table 3, the comparison of mean scores of cognitive distortions in the pretest, posttest and follow-up tests showed that scores in post-test and follow-up were increased in comparison with the pretest. Considering that the higher the number of scores, the more positive the thinking is; the increase in scores shows that the cognitive distortions have been decreased.

Table 4: The results of covariance analysis of the comparison of the experimental group and control group in demoralization and its subscales' post-test scores

Variable	Source of variance	Sum of squares	Degrees of freedom	Average squared	F	Sig	Effect size	Statistical power
Demoralization	Pretest	73.055	1	73.055	6.933	0.016		
	Group	490.216	1	490.216	46.520	0.000	0.710	1
	Error	200.218	19	10.538				
	Total	23201	22					
Meaninglessness	Pretest	21.375	1	21.375	7.219	0.015		
	Group	37.424	1	37.424	12.638	0.002	0.399	0.921
	Error	56.261	19	2.961				
	Total	1922	22					
Dysphoria	Pretest	11.112	1	11.112	6.020	0.024		
	Group	23.123	1	23.123	12.528	0.000	0.397	0.919
	Error	35.070	19	1.846				
	Total	1683	22					
Disheartened	Pretest	0.496	1	0.496	0.354	0.559		
	Group	36.835	1	36.835	26.315	0.000	0.581	0.998
	Error	26.595	19	1.400				
	Total	1333	22					
Helplessness	Pretest	0.834	1	0.834	0.465	0.503		
	Group	8.160	1	8.160	4.550	0.046	0.193	0.526
	Error	34.075	19	1.793				
	Total	563	22					
Feeling failure	Pretest	8.385	1	8.385	19.523	0.000		
	Group	18.794	1	18.794	43.758	0.000	0.697	1
	Error	8.160	19	0.429				
	Total	254	22					1

As shown in Table 4, participation in the cognitive- existential group therapy has significantly decreased the demoralization and its subscales in the elderly. Also in the follow-up phase, a significant decrease was continued.

Table 5: The results of covariance analysis of the comparison of the experimental group and control group in cognitive distortion post-test scores

Variable	Source of variance	Sum of squares	Degrees of freedom	Average squared	F	Sig	Effect size	Statistical power
cognitive distortion	Pretest	72.570	1	72.570	5.060	0.037		
	Group	1688.486	1	1688.486	117.720	0.000	0.861	1
	Error	272.521	19	14.343				
	Total	96991	22					

As shown in Table 5, participation in the cognitive-existential group therapy has significantly decreased the cognitive distortion in the elderly. Also in the follow-up phase, a significant decrease was continued.

## Discussion

The present study was performed to investigate the general assumption that "cognitive-existential group therapy reduces demoralization of the elderly".

The demoralization total mean score were declared as following: pretest (40.27), posttest (27.36) and Follow up (28.54). The results revealed that cognitive-existential group therapy reduces demoralization of the elderly.

Although previous research didn't mention a direct link on the effectiveness of cognitive-existential group therapy in reducing demoralization in the elderly we considered the present results consistent with cognitive-existential group therapy on reducing demoralization in various populations such as people who have: cancer (Kissan et al,1997., Kissan et al, 2003., Breitbart, 2001., Bahmani et al,2010., Naghiay & Bahmani,2014), AIDS (Farmani Shahreza & Bahmani,2016) and MS (Paknia & Bahmani,2015), which showed the effectiveness of cognitive-existential group therapy on reducing demoralization.

As the findings in Table 4 show, the findings confirm the mentioned hypothesis. It seems that the cognitive-existential group therapy and the elements proposed in the treatment protocol, as well as the special way of relations in the sessions have been able to create a positive and significant change in reducing demoralization and its subscales. It should be considered that the treatment atmosphere in the cognitive-existential group therapy is based on listening to the subject's stories considering the here and now, familiarity with the sufferings of others, the use of emotional support and receiving feedback from different people to reduce the feeling of being a victim, the uniqueness of the problem, loneliness and helplessness, discrimination and oppression, feeling of security, secrecy, reflection and empathy, emotional release, self-disclosure, exposure, feedback, affection, acceptance and humour; this can be mentioned as a positive factor for this approach. In this method, the group continued the sessions assuming that the confidence and sympathy between the group members persists and the psychological refinement was done every session.

Part of the content of the cognitive-existential group therapy helps understanding the phenomenological world of individuals using the prepared existential concepts. Using such concepts helps individuals to encounter their existential anxiety and to communicate with their original selves with all the inevitable existential anxieties and instead of denying and reprimanding their unpleasant feelings and emotions, experience them and take responsibility for their feelings, and most importantly, express these feelings and emotions. According to Kissane it is a useful intervention method that can deal with these fears fast and clear enough

and can help reduce mental health problems (Kissane, et al., 2002; quoted from Bahmani et al., 2010).

During the treatment process, the elderly were involved with their existential questions. These questions caused them to activate and discharge their existential anxieties. In general, during the sessions, it became clear that the feeling of lack of a worthwhile future and lack of self-efficacy to achieve it, inevitability and fear of death, lack of faith in the future, feeling of hopelessness, lack of meaning and purpose, and loneliness deprives the elderly from the motivation to try. Existential crisis and disturbances are developed as a result of fear of confrontation with existential anxieties. So during the group process, we tried to help the elderly understand the unpredictability of the world and the uncertainty of the universe, assess their thoughts and assumptions about the uncontrollability of death and loss of opportunities in the past and the resulting anxieties, identify and challenge their cognitive distortions about the meaning of death anxiety (seeing death as the end of everything, unwillingness to track down their illnesses, fear of being forgotten after death, fear of painful death, disqualifying their efforts in their lives, fear of disability) and end their fears by accepting the anxiety of unpredictability and death. We also tried to introduce the concept of fundamental loneliness anxiety and help them identify and challenge their cognitive distortions about the meaning of loneliness (not being understood by close people, especially their spouse and children, the feeling of failing to understand others, the feeling of separation from children, attachment to other individuals to escape loneliness) and accept loneliness as a genuine experience to increase the desire and motivation to be with others and family members. They were also helped to challenge the meaning of their lives created by psychological disturbances and existential anxieties, and find a meaningful term for their lives, and change their attitudes toward problems and tolerance of difficulties, and through giving meaning to the sufferings and pains, change their focus from what has been lost, because the sense of the new meaning and purpose in life during the aging period (which includes the ability to combine and integrate the experiences and achieve an understanding of themselves and the world) is a protective factor against meaninglessness. Also, in the process of group therapy, elderly people tried to accept responsibility and freedom of choice, to identify and challenge their cognitive distortions about the anxiety of responsibility and freedom of choice (assigning responsibility for life events to others or social, cultural, economic, etc. circumstances, leaving the choice to others, believing in luck, trying to show oneself as victim ) and to evaluate their priorities and decisions, and accept their own responsibility for their own destiny. In general, the group therapist tried to help the elderly to accept cognitive distortions that prevented them from experiencing demoralization and activated their defense mechanisms.

In general, according to previous studies cognitive-existential group therapy can be considered as a suitable factor in reducing different types of mental disorders. Bahmani et al. (2010) in their research showed that

cognitive-existential group therapy was more effective than cognitive therapy in reducing the mean of depression and increasing the mean of hopefulness.

Previous studies, consistent with the present study, of Kissane et al. (1997) showed that using this method of treatment is helpful to reduce the amount of sadness and grief in patients with cancer, increase their problem solving ability and also create cognitive strategies. Breitbart (2001) suggested that existential therapies are one of the most appropriate approaches to reduce depression and increase hope in cancer patients. In addition Kissane et al. (2003) concluded that cognitive-existential therapy has a positive effect in reducing overall symptoms of psychological distress in women with non-metastatic breast cancer. In another study, Kissane et al. (2004) concluded that this method would greatly reduce psychological distress and anxiety, and improve family relationships.

Therefore, according to the findings, the cognitive-existential therapy has been able to affect people with chronic conditions such as cancers, breast cancer, human immunodeficiency virus, and the elderly. This should be due to the main distinguishing feature of this intervention method, namely, paying attention to the existential anxieties and considering here and now during the treatment sessions as compared to other methods.

Also, the results of the two-month follow-up showed that cognitive-existential group therapy has a lasting and stable effect on the improvement of demoralization. In explaining this finding, it can be said that Cognitive-Existential psychotherapy can lead to long-term changes in terms of creating philosophical insights and changing attitudes in individuals.

## Conclusions

In general, cognitive-existential group therapy due to addressing the existential concepts, especially for the elderly and dealing with these concepts and working with the unreasonable beliefs of individuals and substituting logical beliefs can lead to the reduction of psychological factors and existential anxieties. Therefore, this method of intervention can be used in the treatment of the elderly, since the elderly need to continue their lives with meaning and purpose without fear of confrontation with death, loneliness, and existential concerns.

## Limitations

The most important limitation of this study was research in the only daily rehabilitation center, which reduced the generalization power of the research.

## Suggestions

Given that existential anxiety is activated in the elderly and addressing these anxieties in counseling and psychotherapy sessions can help to improve the existential crisis of the elderly, it is suggested that counselors of care centers,

rehabilitation centers for the elderly and counseling and psychology clinics be trained based on the treatment plan presented in this study and take advantage of it to help the elderly. In addition, the results of this study can be used to improve the design of educational programs for health care and rehabilitation providers, as well as to plan for prevention of existential crises and to improve the health of the elderly and to prevent serious problems such as suicide in the elderly. Also, it is suggested that the effect of this therapeutic approach on other psychological variables be examined and the effectiveness of this treatment method be compared with other types of cognitive therapies in order to reduce the psychological problems of the elderly in order to achieve the most effective treatment method for this group.

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# Low-dose versus high-dose vitamin D supplementation and pregnancy outcome in gestational diabetes

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## Abstract

**Objective:** To compare pregnancy outcome among pregnant women with gestational diabetes mellitus (GDM) who received low-dose supplementary vitamin D, high-dose vitamin D, or placebo.

**Methods:** In this parallel double-blinded randomized clinical trial, 128 pregnant women with GDM and low serum 25-[OH] D (< 30 ng/mL) were included. They were randomly divided to receive low-dose vitamin D (400 IU tablet once daily, 64 subjects) or high-dose (50,000 IU twice; first at the start of the study and then 21 days later, 64 subjects). In the control group, 64 subjects with GDM but normal serum 25-[OH] D were included. Pregnancy outcome including neonatal anthropometric indices (birth weight, height, and head circumference), hypoglycemia, Apgar scores at minutes 1 and 5, and admission due to pathologic jaundice were recorded.

**Results:** Mean ( $\pm$ SD) newborn birth height was 50.13 ( $\pm$ 1.85) cm which was significantly higher compared to the low-dose group (49.38 $\pm$  2.18 cm); P= 0.02. It was also higher when compared to the control group (49.02 $\pm$  2.02); P= 0.002. No significant difference existed among the groups regarding birth weight and head circumference. Pathologic jaundice, hypoglycemia and Apgar score at minutes 1 and 5 were recorded.

**Conclusion:** Vitamin D supplementation either at low doses or high doses did not have considerable effect on pregnancy outcome in pregnant women with GDM. The only variable which was higher in the high-dose group was the newborn birth height.

**Key words:** 25-hydroxyvitamin D; gestational diabetes; dietary supplements; pregnancy

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## Introduction

Vitamin D is an essential nutrient during pregnancy and has a role in fetal skeletal development and growth (1). Excess calcium required for fetal bone growth in pregnancy necessitates sufficient levels of maternal vitamin D (2). Besides, vitamin D contributes to successful implantation via its immunomodulatory effects (3). Hence, maternal serum vitamin D levels increase to the end of the pregnancy to promote maternal and fetal health (4).

Vitamin D insufficiency/deficiency during pregnancy is a common clinical condition in many countries (5). Several studies have found associations between vitamin D deficiency and maternal and fetal adverse outcomes including pre-eclampsia(6), increased risk of infection, newborn birth size, and mental outcome (7, 8). But, such consequences have not been reported consistently in all studies (9).

One of the vitamin D deficiency complications observed in some studies is maternal higher susceptibility to develop gestational diabetes mellitus (GDM) (10, 11). GDM is manifested by insulin resistance and glucose intolerance and is believed to affect about 6 to 7% of pregnancies in the US (12). In addition to higher risk of developing type II DM later in life in mothers with GDM, short-term complications include polyhydramnios, stillbirth, and macrosomia among others (13).

Low vitamin D levels have been suggested as an independent factor for impaired glucose control and development of GDM and lower levels of vitamin D had an inverse correlation with serum glucose (4, 14, 15). Mothers who were diagnosed with GDM on glucose screening tests at 24-28 weeks of gestation had significantly lower 25-hydroxyvitamin D (25-[OH] D) levels (16). This is probably due to the relation between calcitriol level and beta cell function of the pancreas (17). However, there is controversy in the literature regarding vitamin D level and GDM (18). Some studies reported that vitamin D hypovitaminosis does not relate with either GDM development or pregnancy outcomes (19).

These observations have resulted in studies to investigate the supplemental vitamin D in mothers with normal glucose tolerance (20-23) and GDM (24, 25) to find any beneficial effect of such intervention on glucose level as well as lipid profile, inflammation, and neonatal anthropometric indices. However, studies on mothers with GDM are scarce and not sufficient trials have been conducted to elucidate the exact role of vitamin D supplementation on pregnancy outcome. In addition, the appropriate vitamin D dose is not clear yet (23). Therefore, it seems that further studies are required to answer these ambiguities regarding vitamin D, GDM, and neonatal outcome. This study was done with the objective of determining the effect of two vitamin doses (low-dose vs. high-dose) on pregnancy outcome in mothers with GDM.

## Materials and Methods

### Study Design and Setting

This was a parallel double-blinded randomized clinical trial comparing low-dose, high-dose, and no vitamin D supplementation on pregnancy outcomes among a sample of mothers with GDM. The patients with low serum 25-[OH] D were randomly (using simple randomization method by random table) were assigned to receive low-dose or high-dose vitamin D supplementation. The control group consisted of mothers who had GDM, but their vitamin D level was normal. This study was carried out from 2015 to 2016 at the Diabetes Research Center, Kermanshah.

### Study population

Mothers diagnosed with GDM at gestational weeks 24 to 28 comprised the study population. GDM diagnosis was made considering presence of two of the three criteria: fasting blood glucose > 93 mg/dL, 1-hour oral glucose tolerance test (OGTT) > 180 mg/dL, and 2-h OGTT > 153 mg/dL. Low vitamin D level was considered as serum 25-[OH] D levels of < 30 ng/mL.

### Eligibility criteria

Inclusion criteria consisted of pregnant mothers with age range of 18 to 35 years, gestational age of 24 to 34 weeks. Exclusion criteria were smoking, using alcohol, taking medications including corticosteroids, lithium, isoniazid, ketoconazole, anti-seizure medications, supplemental vitamin D and calcium in the preceding 6 months, cardiac, renal, hepatic conditions, malabsorption, malignancy, thyroid and parathyroid diseases, and chronic inflammation. Also, those who had not taken prenatal supplements regularly, pre-eclampsia, stillbirth, pre-term labor, placental abruption, need to administer insulin, long immobility were not included.

### Sample

Sampling method was consecutive method and considering the neonatal height as the main dependent variable, the sample size was calculated as 64 subjects in each of the three groups.

### Intervention

In the low-dose vitamin D group, oral vitamin D3 (400 IU tablet once daily, Zahravi Pharmaceuticals Co., Tabriz, Iran), was administered until the 36th week of gestation. In the high-dose group, vitamin D3 pearl (50,000 IU daily, Zahravi Pharmaceuticals Co., Tabriz, Iran) was administered twice (first at the start of the study and then 21 days later). The control group which consisted of mothers with GDM and normal 25-[OH] D level (> 30 ng/mL) received a placebo pearl similar to vitamin D pearl twice as in the high-dose group.

### Data Collection

At first, serum 25-[OH] D was measured. The patients were followed until the time of delivery. On the 10th day postpartum the subjects were visited to collect the data about pregnancy outcome. The neonatal anthropometric indices including birth weight (macrosomia was defined

as > 4,000 gr), height, and head circumference, glucose level (to check neonatal hypoglycemia) as well as Apgar scores at minutes 1 and 5 using the recorded data, was documented. Also, admission due to pathologic jaundice was recorded.

### Statistics

The descriptive indices including frequency, percentage, mean and its standard deviation (SD) were used to express data. Normal distribution of continuous variables was evaluated using the Kolmogorov-Smirnov (KS) test and normality diagrams. The Student's t test was used to assess continuous data with normal distribution. For non-normally distributed variables, the Mann-Whitney test was used. In order to compare nominal variables between the two groups, the Chi-square test or the Fischer's exact test was used. Analysis of variance (ANOVA) was used

to compare continuous data with normal distribution (weight) among the three studied groups. To compare non-normally distributed continuous data (birth height and head circumference) among the three groups, Kruskal-Wallis test was used. To determine compliance, number of unused supplements was subdivided from used supplements and then was divided by used supplements. Significance level was set at 0.05. All analyses were performed using SPSS software (ver. 16.0, IBM).

### Ethics

The study protocol was fully supported by the Research Council Ethics Committee of our medical university. The study objectives were explained to the patients and they were asked to provide written consent for enrolment. The study was in conformity with the Declaration of Helsinki.

## Results

A total of 192 pregnant women were included. Of this, 128 subjects had low serum 25-[OH] D levels. The age range of mothers was 20 to 35 years with a mean ( $\pm$ SD) value of 28.64 ( $\pm$ 4.02) years. No statistically significant difference was observed regarding age among the studied groups (Table 1). Mean (SD) pre-pregnancy weight was 70.53 (8.01) Kg (range, 55 to 98). Likewise, no difference existed among the groups regarding this variable. Mean ( $\pm$ SD) gestational age at the time of study recruitment was 26.96 ( $\pm$ 0.87) weeks (range, 26 to 28 weeks). The three groups were comparable regarding this variable. The baseline maternal serum 25-[OH] D level was comparable between low-dose and high-dose vitamin D supplement groups.

**Table 1. Comparison of maternal features (average values) among the three studied groups**

	Low-dose vitamin D (N= 64)	High-dose vitamin D (N= 64)	Control (N= 64)	P value
Age	27.88	29.22	28.83	0.16
Pre-pregnancy weight	72	70	68.64	0.08
Gestational age at entry	27.02	27.11	26.77	0.08
Maternal serum 25-[OH] D	20.3	18.22	33.58	< 0.05 <sup>a</sup> > 0.05 <sup>b</sup>

<sup>a</sup> = difference among the three groups; <sup>b</sup> = difference between low-dose and high-dose vitamin D supplement groups

Table 1 presents comparison of maternal factors among the three studied groups.

Gestational age at the time of delivery did not show significant difference among the groups.

Mean gestational age in control, low-risk, and high-risk groups was respectively 37.88, 37.98, and 37.18 weeks and no significant difference existed between the groups ( $P > 0.05$ ).

Cesarean section (CS) was required in 110 patients (57.3%) and normal delivery in 82 subjects (42.7%). CS was required in 35 (31.8%), 38 (34.5%), and 37 (33.6%) patients respectively in low-dose, high-dose, and control groups ( $P = 0.95$ ).

Regarding neonatal anthropometric indices, no significant difference existed in terms of birth weight between the three groups (Table 2). However, mean value of birth height was higher in the high-dose vitamin D group compared to other groups (Table 2). Between group comparisons showed that mean (SD) height was significantly higher in the high-dose group than in the low-dose group ( $P = 0.02$ ) and in the control group ( $P = 0.002$ ). No statistically significant difference existed regarding mean height between the low-dose group and control groups ( $P = 0.29$ ). Similar to birth weight, no difference existed regarding head circumference among the three groups (Table 2).

Table 3 shows distribution of Apgar scores at minutes 1 and 5 in the three groups. Table 4 shows distribution of macrosomia, hypoglycemia, and pathologic jaundice among the three groups. As observed, no significant difference existed among the three groups regarding the mentioned variables.

**Table 2. Comparison of neonatal birth weight, height, and head circumference among the three studied groups**

	Low-dose vitamin D (N= 64)	High-dose vitamin D (N= 64)	Control (N= 64)	P value
Weight, Kg	3123.44 (±519.07)	3221.09 (±484.91)	3124.41 (±504.5)	0.73 <sup>a</sup>
Height, cm	49.38 (±2.18)	50.13 (±1.85)	49.02 (±2.02)	0.04 <sup>b</sup>
Head circumference, cm	34.60 (±1.85)	35.1 (±1.98)	34.77 (±1.63)	0.11 <sup>b</sup>

<sup>a</sup>ANOVA; <sup>b</sup>Kruskal-Wallis; Data are presented as mean (±SD)

**Table 3: Apgar scores at minutes 1 and 5 in the three studied groups**

	1-minute Apgar score				5-minute Apgar score			
	5	7	8	9	7	8	9	10
Group 1	1 (1.6%)	2 (3.1%)	4 (6.2%)	57 (89.1%)	0	2 (3.1%)	4 (6.2%)	58 (90.6%)
Group 2	0	3 (4.7%)	5 (7.8%)	56 (87.5%)	0	3 (4.7%)	3 (4.7%)	58 (90.6%)
Group 3	0	1 (1.6%)	6 (9.4%)	57 (89.1%)	0	0	4 (6.2%)	60 (93.8%)

Group 1= Low-dose vitamin D supplement, Group 2= High-dose vitamin D supplement , Group 3= Control

**Table 4. Frequency distribution of macrosomia, hypoglycemia, and pathologic jaundice among the three groups**

	Low-dose vitamin D (N= 64)	High-dose vitamin D (N= 64)	Control (N= 64)	P value
Macrosomia	2 (3.1%)	2 (3.1%)	2 (3.1%)	> 0.05
Hypoglycemia	13 (20.3%)	8 (12.5%)	5 (7.8%)	0.11
Pathologic jaundice	13 (20.3%)	8 (12.5%)	5 (7.8%)	0.11

## Discussion

Vitamin D deficiency during pregnancy is still a public health issue which needs more attention. This state can be associated with unfavorable pregnancy outcomes. GDM and impaired glucose intolerance also can be associated with some unwanted maternal, fetal, and neonatal outcomes. Efforts have been made to study the effect of vitamin D supplements on pregnancy outcomes in pregnant mothers with vitamin D deficiency. The results of such studies can help health care professionals to decide whether vitamin D supplements have any beneficial effect of pregnancy outcomes or not. Based on our findings, vitamin D supplementation did not have any significant effect on pregnancy outcomes regarding newborn birth size, Apgar scores, and the frequency of hypoglycemia, pathologic jaundice, and macrosomia. The only variable which showed a significant difference between the study groups was neonatal height which was higher in the high-dose vitamin D group.

The usefulness of vitamin D supplements in GDM is stemmed from observations that vitamin D is related to glucose metabolism and insulin resistance. However, there is inconsistency among the reports as some believe that factors such as obesity and genetic polymorphisms can act as confounding variables in this relationship (7). It has been shown that administration of vitamin D for 6 weeks in GDM resulted in decreased fasting plasma glucose and serum insulin (24). Such observations in pregnant women are scarce. More studies have been done on non-pregnant

women. For instance, vitamin D supplements in women with low serum vitamin D levels resulted in considerable improvement in insulin sensitivity and insulin resistance, in particular when serum 25(OH) D rose to 80 ng/mL(26). 1,25-dihydroxyvitamin D<sub>3</sub> has been shown to activate the human insulin receptor (27).

The obtained results are somehow compatible with a previous study on 45 pregnant women with GDM who received high-dose vitamin D (50,000) two times and placebo group (25). The authors reported that vitamin D supplementation resulted in no significant difference in newborn birth size or 1- and 5-minute Apgar scores. However, in contrast to our results, hyperbilirubinemia and hospital admission were significantly lower in the intervention group. The only variable that showed difference between low-dose and high-dose groups was newborn birth height. In the previous similar study, birth height, weight, and head circumference did not show difference between high-dose and control groups (25). There are conflicting results in the literature regarding the effect of treating low vitamin D level on fetal growth in pregnant mothers without GDM. For example, in a study recruiting pregnant patients with vitamin D levels < 30 ng/mL, administration of vitamin D 50,000 IU weekly for 8 weeks resulted in higher newborn birth weight, height, and head circumference in the intervention group (28). In another meta-analysis, it was revealed that vitamin D supplementation resulted in improvement in offspring birth weight and length (29). However, there are studies that, similar to our study, did not find any beneficial effect of vitamin D supplementation regarding newborn anthropometric features (1).

GDM is one of the variables that can lead to increased CS rate, macrosomia, hypoglycemia, and hyperbilirubinemia(15). According to the presented findings, vitamin D administration in two different doses did not affect these outcomes.

### Limitations and Strengths

We faced some limitations in this study. We measured serum 25-[OH] D at the time when GDM was diagnosed (i.e., the third trimester). We did not have any information about the first-trimester serum 25-[OH] D level. Some studies have emphasized on serum 25-[OH] D levels at the first trimester as a potential factor in pregnancy outcome. Also, we were not able to follow the mothers to find out what percentage develop type 2 DM. In addition, physical activity and dietary factors were not studied. On the other hand, baseline maternal weight, age, and gestational age were comparable among the groups and these factors cannot have significant effect on the observed findings.

### Conclusion

Vitamin D supplementation either at low doses or high doses did not have considerable effect on pregnancy outcome in pregnant women with GDM. The only variable which was higher in the high-dose group was the newborn birth height.

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# Endothelial function and flow-mediated dilation of brachial artery in pre-eclampsia: color Doppler ultrasound study

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## Abstract

**Background:** Endothelial dysfunction plays an important role in pre-eclampsia pathogenesis. This can be assessed non-invasively by measuring arterial flow-mediated dilation (FMD).

**Objective:** To compare FMD of the brachial artery and endothelial function between healthy mothers and those who were diagnosed with pre-eclampsia.

**Methods:** Three groups of pregnant women 20 to 35 years old in gestational weeks 32 to 40 were recruited including healthy subjects (60 cases), mild pre-eclampsia (60 cases), and severe pre-eclampsia (60 cases). FMD of the brachial artery was measured by color Doppler ultrasound and compared between the groups.

**Results:** Mean FMD values were 9.72%, 5.07%, and 4.33% respectively in the healthy group, mild pre-eclampsia, and severe pre-eclampsia ( $P < 0.001$ ). According to logistic regression analysis, FMD (adjusted  $R^2 = 25\%$ ), RI (adjusted  $R^2 = 17.5\%$ ), PI (adjusted  $R^2 = 29.3\%$ ), intima-media thickness (adjusted  $R^2 = 43.3\%$ ) ( $P < 0.001$ ) and BMI value (adjusted  $R^2 = 10.3\%$ ,  $P = 0.006$ ) were found to be significant predictors of pre-eclampsia. However, maternal age (adjusted  $R^2 = 1.4\%$ ,  $P = 0.39$ ),

gestational age (adjusted  $R^2 = 0.1\%$ ,  $P = 0.98$ ), and parity (adjusted  $R^2 = 5.5\%$ ,  $P = 0.83$ ) were not found as significant predictors of pre-eclampsia. With increasing value of FMD of the brachial artery the likelihood of pre-eclampsia decreased. With increasing value of intima-media thickness, PI, and RI, the likelihood of pre-eclampsia increased. Brachial artery FMD had sensitivity, specificity, PPV, and NPV values of respectively 70%, 76.7%, 85.7%, and 56.1% to predict pre-eclampsia.

**Conclusion:** Color Doppler ultrasound parameters especially FMD of the brachial artery is a useful non-diagnostic method to predict pre-eclampsia in the third trimester.

**Key words:** Pregnancy; pre-eclampsia; Doppler ultrasound; endothelium; flow-mediated dilatation

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## Introduction

Pre-eclampsia is a multi-organ and serious disease affecting pregnant women after gestational week 20, characterized by new-onset hypertension and proteinuria. It usually presents in the third trimester (1). It is a complicated condition reported as the main cause of morbidity and mortality for both the mother and her fetus. Its incidence is estimated as 3 to 7% of all pregnancies (2). The pathogenesis of pre-eclampsia is multi-factorial and includes maternal, fetal, and placental factors. At the moment, there is no way to prevent this disorder and studies are done to identify those who may be at risk for this pregnancy-specific condition.

One of the pathogenic factors involved in pre-eclampsia is maternal systemic vascular dysfunction which is believed to be due to different factors such as secretion of angiogenic factors that bind to placental and endothelial growth factors. Decreased level of serum placental growth factor in pre-eclamptic women has been shown previously (3). This vascular dysfunction is determined as the main cause of hypertension in pre-eclampsia (4). Endothelial damage is considered as a main factor in pathophysiology of pre-eclampsia (5) and decreased nitric oxide production and endothelium dependent arterial dilation have been shown (6). In addition, production of vasopressor substances can cause vascular endothelial damage as well as vasoconstriction. Hence, several organs including kidneys (proteinuria), brain, and liver may be involved (7-9). Nitric oxide has a critical role in the trophoblast invasion and its availability is required for normal endothelial function (10).

Earlier detection of pre-eclampsia is an important issue and efforts are ongoing to find appropriate diagnostic methods to predict the occurrence of this condition. It is possible to monitor more frequently those who are defined as high risk for developing pre-eclampsia at earlier stages in order to prevent morbidity and mortality. Currently, no agreed upon method exists to predict pre-eclampsia accurately. However, it does not mean that none of the studied variables so far has been useless. Flow-mediated dilation (FMD) is one of the diagnostic methods to study vascular endothelial function, mainly in the brachial artery (11, 12). This method has been studied in first and third trimesters. However, the results show controversy regarding whether this method can be used in conjunction with other clinical and laboratory variables to predict pre-eclampsia (5, 12-14). For instance, FMD in the first trimester was not found to be a valuable predictor factor for pre-eclampsia (13). Another study using FMD in the second trimester also did not demonstrate the predictive effect of this method (7). In contrast, another study showed that changes in FMD values in the second trimester were able to predict pre-eclampsia whether early or late form (12).

A major reason that attracts investigators studying FMD is that it can assess endothelial dysfunction, a major component to the pathophysiology of pre-eclampsia, non-invasively by ultrasound. By this method brachial, radial, or femoral artery diameter changes during pregnancy can

be determined (15). Here, we decided to compare FMD of the brachial artery and endothelial function between healthy mothers and those who were diagnosed with pre-eclampsia.

## Materials and Methods

### Study design

This was a cross-sectional study that lasted for 20 months from 2015 to 2017 in our university hospital obstetrics and radiology departments. Three groups were recruited including healthy mothers, and those with mild pre-eclampsia, and severe pre-eclampsia. Mild pre-eclampsia was defined as systolic blood pressure (BP) of 140 to 160 mmHg, diastolic BP of 90 to 100 mmHg, proteinuria of more than 300 mg/24 h and/or  $> +2$  on two urine samples obtained at least 6 hours apart from each other. Severe pre-eclampsia was defined as systolic BP  $> 160$  mmHg, diastolic BP  $> 100$  mmHg, proteinuria of more than 2 g/24 h and/or  $> +3$  on two urine samples obtained at least 6 hours apart from each other, and presence of any of the following: headache, blurred vision, epigastric pain, elevated aspartate aminotransferase (AST) or alanine aminotransferase (ALT), elevated bilirubin, elevated serum creatinine, hemolysis, oliguria ( $< 30$  cc urine per hour), pulmonary edema, or restricted intrauterine fetal growth.

### Study population

The study population consisted of women with single pregnancy in gestational weeks 32 to 40 who presented to our obstetrics unit for pregnancy care. Inclusion criteria were age range of 20 to 35 years and single pregnancy. Those with underlying systemic diseases such as cardiovascular, renal, hepatic, and thyroid disorders were excluded.

### Study sample

A total number of 180 patients were enrolled into the study in three groups: healthy mothers without pre-eclampsia (60 subjects), mild pre-eclampsia (60 patients), and severe pre-eclampsia (60 patients). The study sample was calculated considering FMD values of 6, 10, and 13.6 (16) respectively in healthy, mild, and severe pre-eclampsia groups. Considering power of 80% and  $\alpha = 5\%$ , the sample size was estimated as at least 60 subjects in each group.

### Variables

The studied variables included systolic and diastolic BP, maternal age, gestational week, maternal weight, parity, body mass index (BMI), proteinuria, and ultrasound examination. FMD was measured by color Doppler ultrasound examination of the brachial artery (Samsung Medison, Accuvix® A30). In addition, brachial artery diameter, intima-media thickness, pulsatility index (PI), and resistance index (RI) were documented. The ultrasound examination was done by a board-certified radiologist.

In order to measure BP, sphygmomanometer with appropriate cuff size (cuff length of 80%) was placed on the left arm while the patient was in seated position without

any physical activity for at least the last 10 minutes. For those who were not able to sit still, BP of the left arm was measured while the patient was lying on her left side. Laboratory tests including urine protein and analysis, hepatic transaminases, renal function tests were also recorded. All the variables documented were entered into a pre-designed checklist of data collection. The data were gathered by an obstetrics resident and supervised by a board certified obstetrician. The final diagnosis of mild and severe pre-eclampsia was made by the obstetrician.

### Statistical analyses

Descriptive indices including frequency, percentage, mean and its standard deviation (SD) were used to express data. The normal distribution of continuous data was determined using the Kolmogorov-Smirnov test. In order to compare categorical variables between the studies groups, the chi-squared test was used. In comparison of continuous data among the three groups, normally distributed data

were compared by analysis of variance (ANOVA) and Kruskal-Wallis test was applied for those with non-normal distribution. In comparison of continuous data between the two groups (healthy vs. pre-eclampsia), the Student's t test or Mann-Whitney U test was used. A logistic regression model was developed to determine the significant risk factors for pre-eclampsia. A p value of less than 5% was considered statistically significant. In addition, sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) values of the variables were calculated using cross-tabulations and yielded true positive (sensitivity) and true negative (specificity) statistics.

### Ethics

The study protocol was verified by the Research Council Ethics Committee of our medical university. The study objectives were explained to the patients and they were asked to provide written consent for enrolment. The study was in conformity with the Declaration of Helsinki.

## Results

Table 1 shows comparison of maternal age, gestational age, BMI, and systolic and diastolic BP values among the three studied groups. As observed, except for maternal age which did not show difference among the groups, other variables showed significant difference between the groups.

**Table 1: Comparison of age, gestational age, parity, body mass index among three groups of pregnant women: healthy subjects, mild-preeclampsia, and severe pre-eclampsia**

	Healthy group (N= 60)	Mild pre-eclampsia (N= 60)	Severe pre-eclampsia (N= 60)	P value
Maternal age, year	29.98 ( $\pm$ 4.08)	30.15 ( $\pm$ 3.24)	30.02 ( $\pm$ 3.92)	0.96 <sup>a</sup>
Gestational age, week	34.7 ( $\pm$ 2.06)	35.42 ( $\pm$ 2.04)	34.28 ( $\pm$ 1.9)	0.008 <sup>a</sup>
BMI, kg/m <sup>2</sup>	25.16 (3.77)	28.5 (4.7)	27.82 (5.03)	< 0.001 <sup>a</sup>
Systolic BP	110.08 (13.88)	137.27 (7.05)	164.78 (11.34)	< 0.001 <sup>a</sup>
Diastolic BP	69.17 (0.87)	83.42 (0.76)	99.5 (1.03)	< 0.001 <sup>a</sup>

Abbreviations: BMI= body mass index, BP= blood pressure. Data are presented as mean ( $\pm$ standard deviation); <sup>a</sup> ANOVA (analysis of variance)

Table 2 shows frequency distribution of subjects in the categories of the variables. About 51.7% of patients in the severe pre-eclampsia group were older than 30 years. About 53.3% of patients with severe pre-eclampsia were within the gestational age of 32 to 34 weeks. As seen in Table 2, 23.3% of severe pre-eclamptic women had BMI values of 32 to 39 kg/m<sup>2</sup>. As observed, 40% of patients in the severe pre-eclampsia group experienced pre-eclampsia in their first pregnancy.

Table 3 presents frequency distribution of patients in each group according to systolic and diastolic BP values as well as proteinuria grade. A higher percentage of patients in the severe pre-eclampsia group had +3 proteinuria. There was significant difference ( $P < 0.001$ ) among the three groups regarding proteinuria grade.

Table 4 shows comparison of color Doppler ultrasound examination findings among the three studied groups. Mean FMD values were 9.72%, 5.07% and 4.33% respectively in the healthy group, and the mild pre-eclampsia, and severe pre-eclampsia groups ( $P < 0.001$ ). About half of the patients with severe pre-eclampsia had intima-media thickness of 0.5 to 0.65 mm.

**Table 2: Frequency distribution of subjects in the categories of the variables among three groups of pregnant women: healthy subjects, mild-preeclampsia, and severe pre-eclampsia**

		Healthy group (N= 60)	Mild pre-eclampsia (N= 60)	Severe pre- eclampsia (N= 60)
Age, year	20-25	10 (16.7%)	1 (1.7%)	11 (18.3%)
	25-30	21 (35%)	32 (53.3%)	18 (30%)
	30-35	29 (48.3%)	27 (45%)	31 (51.7%)
Gestational age, week	32-34	28 (46.7%)	21 (35%)	32 (53.3%)
	34-36	19 (31.7%)	18 (30%)	20 (33.3%)
	36-38	12 (20%)	19 (31.7%)	8 (13.3%)
	38-40	1 (1.7%)	2 (3.3%)	0
BMI, kg/m <sup>2</sup>	18-25	31 (51.7%)	15 (25%)	24 (40%)
	25-32	26 (43.3%)	30 (50%)	22 (36.7%)
	32-39	3 (5%)	15 (25%)	14 (23.3%)
Parity	1	23 (38.3%)	26 (43.3%)	24 (40%)
	2	20 (33.3%)	16 (26.7%)	14 (23.3%)
	3	10 (16.7%)	15 (25%)	20 (33.3%)
	4	4 (6.7%)	1 (1.7%)	1 (1.7%)
	5	3 (5%)	2 (3.3%)	1 (1.7%)

**Table 3. Frequency distribution of patients in each group according to systolic and diastolic BP values and proteinuria grade**

		Healthy group (N= 60)	Mild pre- eclampsia (N= 60)	Severe pre-eclampsia (N= 60)
Systolic BP, mmHg	90 to 130	59 (98.3%)	14 (23.3%)	1 (1.7%)
	130 to 180	1 (1.7%)	46 (76.7%)	59 (98.3%)
Diastolic BP, mmHg	60 to 85	59 (98.3%)	38 (63.3%)	4 (6.7%)
	85 to 120	1 (1.7%)	22 (36.7%)	56 (93.3%)
Proteinuria	0	35 (58.3%)	15 (25%)	0
	+1	24 (40%)	34 (56.7%)	1 (1.7%)
	+2	1 (1.7%)	11 (18.3%)	7 (11.7%)
	+3	0	0	52 (86.7%)

**Table 4. Comparison of color Doppler ultrasound examination findings among the three studied groups**

	Healthy group (N= 60)	Mild pre-eclampsia (N= 60)	Severe pre- eclampsia (N= 60)	P value
Intima-media thickness, mm	0.3 (±0.05)	0.37 (±0.04)	0.49 (±0.08)	< 0.001 <sup>a</sup>
Pulsatility index, cm/sec	2.26 (±0.39)	3.19 (±0.85)	3.9 (±0.78)	< 0.001 <sup>b</sup>
Resistance index, cm/sec	0.81 (±0.07)	0.85 (±0.06)	0.88 (±0.05)	< 0.001 <sup>b</sup>
FMD, %	9.72 (±4.87)	5.07 (±3.03)	4.33 (±2.28)	< 0.001 <sup>b</sup>

Data are presented as mean (±standard deviation); <sup>a</sup> ANOVA (analysis of variance); <sup>b</sup> Kruskal-Wallis

Table 5 (next page) shows frequency distribution of subjects in the categories of the color Doppler ultrasound findings among the three groups of pregnant women. As observed, 60% of patients in the severe pre-eclampsia group had PI values of 3.9 to 6.2 cm/sec.

**Table 5: Frequency distribution of subjects in the categories of the color Doppler ultrasound findings among three groups of pregnant women**

		Healthy group (N= 60)	Mild pre- eclampsia (N= 60)	Severe pre- eclampsia (N= 60)
Intima-media thickness, mm	0.2 to 0.35	49 (81.7%)	24 (40%)	3 (5%)
	0.35 to 0.5	11 (18.3%)	36 (60%)	29 (48.3%)
	0.5 to 0.65	0	0	28 (46.7%)
PI, cm/sec	1.6 to 3.9	59 (98.3%)	45 (75%)	24 (40%)
	3.9 to 6.2	1 (1.7%)	15 (25%)	36 (60%)
RI, cm/sec	0.82 to 0.64	41 (68.3%)	24 (40%)	12 (20%)
	0.82 to 1	19 (31.7%)	36 (60%)	48 (80%)
FMD, %	0 to 12	45 (75%)	60 (100%)	60 (100%)
	12 to 24	15 (25%)	0	0

Abbreviation: PI= pulsatility index, RI= resistance index, FMD= flow-mediated dilation

According to logistic regression analysis, FMD (adjusted R2 = 25%), RI (adjusted R2 = 17.5%), PI (adjusted R2 = 29.3%), intima-media thickness (adjusted R2 = 43.3%) ( $P < 0.001$ ) and BMI value (adjusted R2 = 10.3%,  $P = 0.006$ ) were found to be significant predictors of pre-eclampsia. However, maternal age (adjusted R2 = 1.4%,  $P = 0.39$ ), gestational age (adjusted R2 = 0.1%,  $P = 0.98$ ), and parity (adjusted R2 = 5.5%,  $P = 0.83$ ) were not found as significant predictors of pre-eclampsia. With increasing value of FMD of the brachial artery the likelihood of pre-eclampsia decreased. With increasing value of intima-media thickness, PI, and RI, the likelihood of pre-eclampsia increased.

Brachial artery FMD had sensitivity, specificity, PPV, and NPV values of respectively 70%, 76.7%, 85.7%, and 56.1% to predict pre-eclampsia.

## Discussion

According to the obtained findings, color Doppler ultrasound parameters especially FMD of the brachial artery is a useful method to predict pre-eclampsia in the third trimester. Prediction of pre-eclampsia is a critical issue in obstetrics as pre-eclampsia, despite improvements in its diagnosis and management, has significant morbidity and mortality. Some clinical characteristics have been proposed as potential risk factor for pre-eclampsia such as nulliparity, older maternal age, higher BMI values, previous history of pre-eclampsia, etc (17). However, no definite factor can accurately predict pre-eclampsia and this condition still remains one of the challenging diagnoses for obstetricians for which the only treatment is delivery. Our findings showed that higher BMI values were associated with pre-eclampsia which is compatible with previous reports. However, regression analysis did not show parity, gestational age, or maternal age to be significant predictive values for pre-eclampsia. Since patients at higher risk of pre-eclampsia need more meticulous attention to assure a safe pregnancy and avoid complications such as intrauterine growth retardation (IUGR), recognizing women who are susceptible to this condition has always been a fascinating research topic for investigators.

One of the fascinating diagnostic methods that has gained attention in recent years is studying endothelial function. This can be assessed by several methods such as serum markers (Endothelin-1, nitric oxide, vascular cell adhesion molecules, etc (14). Another method is determining the dilation of the artery by Doppler ultrasound (5, 6, 18, 19).

Most studies have shown reduced FMD in pre-eclampsia in comparison to normotensive subjects (5, 12). Although FMD has been studied in several arteries including uterine and ophthalmic arteries (20), the brachial artery is the most widely studied artery in this setting.

Our study findings are in agreement with these results that brachial artery FMD was significantly lower in the pre-eclampsia group compared to the healthy group. Here, we included patients who were diagnosed with pre-eclampsia considering the established clinical and laboratory variables. The usefulness of FMD has also been in patients who were presumed to develop pre-eclampsia. For example, a previous study showed that endothelial function impairment occurs long before the development of pre-eclampsia, even as soon as the first trimester (21). Furthermore, patients with previous history of pre-eclampsia had lower FMD and decreased arterial dispensability compared to those without previous history of pre-eclampsia (22).

Although several studies have addressed the utility of FMD in pre-eclampsia, there is controversy in the literature regarding FMD changes in prediction of pre-eclampsia. Some studies showed results which are in agreement with ours (5, 23-25). However, some studies challenge the utility of this method to predict pre-eclampsia. For example, in a study (13) including 487 pregnant women in the first trimester, brachial artery FMD in the unaffected group (7.4%) was not considerably different ( $P = 0.37$ ) from late-onset pre-eclampsia (5.6%) and early-onset pre-eclampsia (11.4%). The authors concluded that FMD in the first trimester did not predict the occurrence of pre-eclampsia.

Another recent study including 14 healthy pregnant women and 14 patients with pre-eclampsia showed that FMD was significantly lower in the pre-eclampsia group (4.83%) vs. healthy group (8.53%) (26).

When evaluating the obtained findings and the available evidence, although some conflicting results exist, it seems that brachial artery FMD can be used as a non-invasive method to diagnose pre-eclampsia. However, it should be mentioned that a gold standard test for determining endothelial function is still unavailable and we think that future studies include other markers of endothelial dysfunction in pre-eclampsia with longer follow-ups to elucidate the role of FMD by brachial artery ultrasound examination more accurately.

### Limitations

We faced some limitations in this study. We were not able to follow the pregnancies to find out the outcomes regarding delivery and neonatal factors. Even, some studies have proposed that mothers with pre-eclampsia are more susceptible to cardiovascular diseases later in their life (2). We think that longer follow-ups can elucidate more dimensions of this condition.

### Conclusion

Due to changes in vascular function during pre-eclampsia, Doppler ultrasound examination of the brachial artery showed that the obtained parameters including intima-media thickness, PI, RI, and FMD were significant predictors for pre-eclampsia. As this method is non-invasive and can be done quickly at the bedside, we recommend that clinicians use this method to diagnose pre-eclampsia.

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# Investigating the Factors Affecting Short-Term Mortality Rate in Patients with Acute Chest Pain

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## Abstract

**Background:** In developed and developing countries, coronary heart disease is considered as the main cause of illnesses and mortality. In this respect, chest pain is the most common early symptom in patients affected with coronary artery disease. Approximately 1.3 of deaths due to acute myocardial infarction occur one or two hours following the onset of early signs. Thus, the key priority in preventive medicine is to reduce or control factors affecting mortality rates among these patients. In this regard, investigating the causes and the factors affecting short- and long-term mortality rates in such patients is of utmost importance. Due to the significance of the time to receive treatment in these patients, as well as the small number of research studies, the time pattern and the effect of delay in the treatment of patients suffering from heart diseases were evaluated in this study.

**Materials and Methods:** In this follow-up cohort study; a total number of 3,229 eligible patients were selected out of the 7,432 phone calls to Tehran emergency medical services during the first six months of 2012; then the given variables were measured and the status of short-term outcomes following chest pain attacks was evaluated. Finally, the data from 2094 patients were analyzed. To evaluate the relationship between the selected variables and the given outcomes, the statistics of Chi-square test and correlation coefficient with a 0.05 significance level were employed.

**Findings:** The results revealed that 50.1% of patients were male and 49.9% of them were women. The most frequent request for help had occurred between 6 a.m. and 12 a.m. with the highest frequency rate recorded at 12 p.m., 11 p.m., 1 p.m., 10 p.m. and 11 a.m.; respectively. Furthermore, no significant difference ( $p$ -value=0.001) was observed comparing the time factors of one week and one month as well as the 24-hour cycle.

**Conclusion:** It was concluded that identifying the predictors and the factors associated with survival in patients suffering from acute coronary syndrome could affect their survival rates. In this study and following multivariate logistic regression analysis, time factors such as one-week period, one-month period, and the cycle of request times for day-and-night help did not have any impacts on survival rates in the given patients.

**Key words:** Acute Chest Pain,  
Daily Cycle, Time Pattern,  
Pre-Hospital Emergency Medical Services

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## Introduction

Chest angina or chest pain and acute myocardial infarction are two of the most common manifestations of coronary heart disease (CHD) known as coronary artery disease. About 1.3 deaths resulting from acute myocardial infarction happen within one or two hours prior to the appearance of early symptoms and such patients usually die before their admission into hospitals. Thus, the main priority of preventive medicine is to reduce or control the factors affecting short- and long-term mortality rates in these patients (1, 2).

Since most cases of deaths due to cardiovascular events occur before admission into hospitals, improvements in hospital treatments have by themselves limited effectiveness in decreasing mortality rates. In this respect, investigating the causes and the factors affecting short- and long-term mortality rates among these patients can be of utmost importance. For example, factors such as age, gender, history of smoking, history of aspirin consumption, and presence or absence of underlying diseases can be taken into account as significant ones affecting the mortality of patients suffering from heart diseases and the subsequent disabilities in this group (3, 7). Despite the importance of the time of receiving treatment by these patients, the related studies in terms of time patterns and the effect of delay in providing heart disease treatment are not enough.

Thus, the present study was conducted in the form of a cohort research within a six-month period in 2012 in order to evaluate the factors affecting short-term mortality in patients suffering from acute chest pain. In this study, 2,094 patients with sudden chest pain at different hours of the day were investigated.

## Materials and Methods

### Patient Selection

Patients aged 45 years and over affected with heart pain attacks extended in precordial or substernal areas, prolonged 20 minutes or so and that lasted during the visit by the emergency medical services (EMS), with no other obvious diagnosis justifying chest pain were included in this study. All the patients with characteristics inconsistent with the defined criteria within the six-month study period were excluded.

First, the pre-hospital EMS personnel in the city of Tehran were trained in terms of how to record patient complaints about acute chest pains. In the next step in this study, all the phone calls containing complaints associated with discomfort in chest area and the specified keyword (heart disease) were recorded.

### Data Collection Instrument

The data collection instruments were audio-taped files available for all patients at the time of their phone calls to the EMS. After listening to the conversations in 7,200

audio files obtained during the study, a total number of 3,725 files matched with the study criteria were identified. In this respect, pre-hospital forms had been also recorded for 3,229 cases which were distinguished as appropriate ones in order to extract the given issues and were then included in the present study. These forms contained personal information, time of records, vital signs, patient's clinical status, and transfer or non-transfer of the patients to hospital, which were completed by the trained EMS personnel in the city of Tehran.

### Data Analysis Method of the Study

Out of the 3,229 patients with pre-hospital forms, 2,094 cases were evaluated and then the onset time of chest pain until the time of request for help from the EMS and its effect on short-time mortality rates (one week and one month) in patients suffering from acute chest pain, the time interval between request for help from the EMS and its impact on short-term mortality in patients affected with acute chest pain, as well as the time interval between the visit by the EMS and the admission into the emergency department and its effect on short-term mortality among patients with acute chest pain, were examined. In the next step, patient information was extracted from the special pre-hospital forms and then recorded in the pre-designed and specific forms for data record. The data collection method associated with mortality was conducted through telephone conversations with patients' attendants and the patients themselves as well as examination of hospital records belonging to patients admitted into some hospitals. The given data were finally inserted into Tables associated with statistical calculations.

To validate the data and to measure their accuracy, a total number of 332 patients with records available in the archives department of hospitals out of the total number of 400 patients referred to the three selected hospitals were investigated in order to compare and to evaluate the data extracted from the given records with the data recorded by the EMS personnel. Following the completion of the checklists, the data obtained for this study were entered into computers and analyzed through the SPSS Software. The time of phone calls to the pre-hospital EMS was similarly calculated via descriptive statistics tests. The differences in the given variables were also measured through t-test and Chi-square test. The relationship between the defined factors and the CHD mortality rates during one week or one month from the onset of the symptoms were considered significant based on the P-value lower than 0.05.

## Findings

The results revealed that a total number of 1,135 cases were not transferred to hospitals due to reasons including patient refusal to be transferred to hospital, outpatient and in-home treatments, deaths during transfer, deaths before the arrival of ambulance, absence of patients after the arrival of the EMS personnel in the given location, or cancellation of the EMS mission to hospitals. Of these, 10 cases died before the arrival of ambulance or on the way to hospital, 45 individuals received outpatient and in-

home treatment, 95 patients were not transferred to any hospitals owing to lack of cooperation in terms of transfer after getting signatures from them by the EMS personnel, 115 cases were also not transferred to hospitals due to cancellation of missions, absence of patients at the time of the arrival of ambulance, transfer by personal cars, patient recovery, as well as wrong addresses. Thus, all these cases were excluded from the present study.

In total, 2,094 patients were admitted into 58 hospitals within the city of Tehran during this study. Besides, these patients were tracked following the appearance of the symptoms and making calls to the EMS in the city of Tehran.

The findings showed a relative sinus rhythm in 8-hour periods within the study population. The figure also illustrated three peaks at about 1 a.m., 12 p.m., and 12 a.m. The sinus rhythm in the requests during the 4-hour day-and-night periods revealed that the most frequent requests had been made within 8 a.m. to 12 p.m. and 8 p.m. to 12 a.m.

The frequency distribution of mortality within the first week based on the one-hour day-and-night periods demonstrated that the distribution of mortality rates in the first week and the most frequent mortality rates within the first week had taken place among those whose requests for help had been made near midday and then late at night. Moreover, the distribution of the mortality rates based on one-hour daily periods showed that the most frequent mortality rates within the first month had occurred among individuals whose requests for help had been filed near noon and then at midnight (Figure 1).

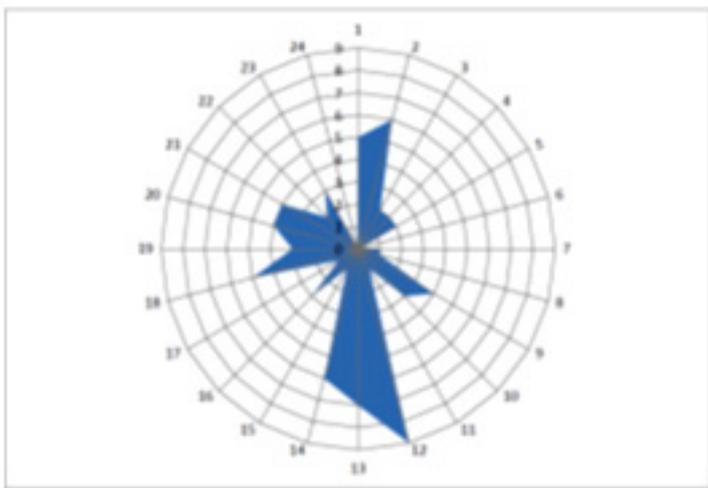
The frequency distribution of mortality within the first week in the given population based on 5-year age groups indicated that the mortality rates had a rising linear trend in terms of the increase in the age of those making requests for help. Thus, the most frequent mortality rates had happened in the age group of individuals over 80 years.

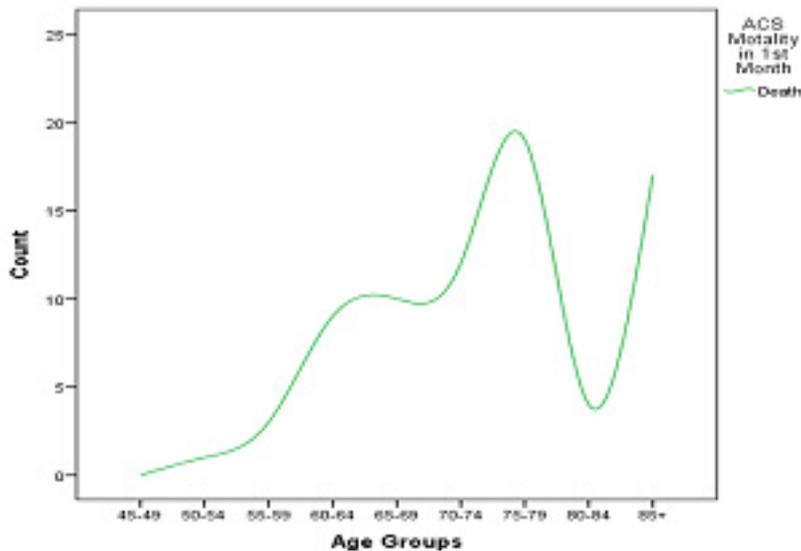
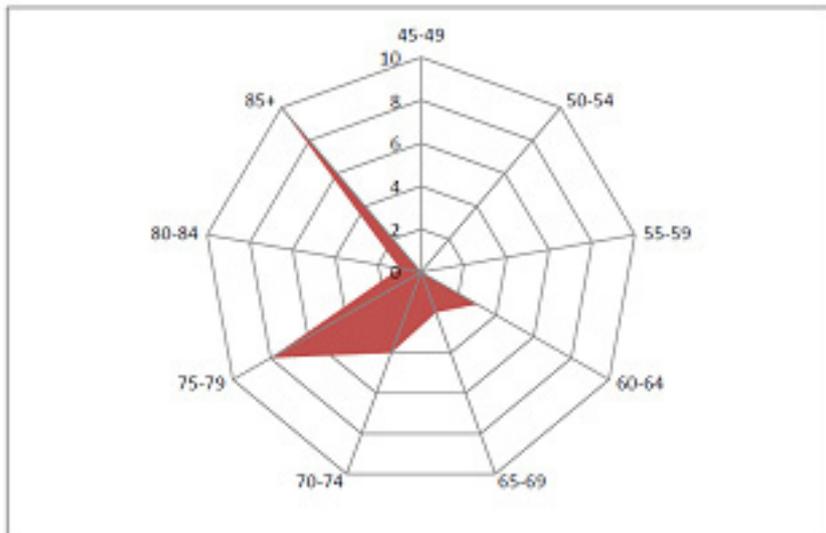
Moreover, the frequency distribution of the CHD mortality within the first month in the given population based on age groups revealed that the mortality rates had a rising linear trend in terms of the increase in the age of patients making requests for help. Therefore, the most frequent mortality rates had occurred in the age group of individuals over 70-79 years. In other words, late deaths had occurred in lower age groups compared with higher age groups (Figure 2 - next page).

Examining the age pyramid for the given population also suggested that the most frequent requests for help had been made between ages 45 and 50 years and then between 55 and 60 years. Therefore, those who had survived within the first week were in the age group of 60 to 65 years and the deceased ones were in the age group of 75 to 80 years. The major concentration of mortality rates were in the age groups over 65 years particularly with two peaks in the age groups of 70-74 years and over 85 years in the given population (Figure 3). However, the most frequent distribution of mortality rates within the first month was associated with the age groups over 65 years with stronger concentration of mortality rates in the age range of 70 to 79 years.

The analysis of the research hypothesis for the differences in the mortality rates within the first week and also within the first month in four-hour daily periods was not statistically significant even though these findings were visually of importance. Given the population size in this study with their pre-hospital files (2,094 patients), the CHD mortality rates within one week and one month were estimated as 1.3% and 4.88%; respectively.

**Figure 1: Frequency distribution of mortality within the first month in the study population based on one-hour daily periods**



**Figure 2: Frequency distribution of the CHD mortality in the study population based on 5-year age groups****Figure 3: Mortality pattern within one week based on age groups in the study population**

## Discussion

The results of this study demonstrated that factors such as day-and-night periods, age range over 65 years, history of smoking, history of hypertension, symptoms accompanied by acute chest pain such as sweating and shortness of breath or a history of previous illnesses such as gastrointestinal diseases, and history of cerebrovascular attacks were among the most significant factors affecting CHD.

In this respect, a study on risk factors affecting survival rates in 2,020 patients suffering from acute chest pain in 2008 reported gender (masculinity), age over 65 years, and place of living as the most important risk factors affecting mortality among these patients. A statistically significant relationship was also observed between age, gender, place of living, occupation, and survival rate ( $P < 0.05$ ) (1). In reviewing the existing literature on patients with acute coronary syndrome from 1988 to 2009, higher mortality rates were similarly observed in women than in men (8). Gender-related differences in short-term mortality from cardiovascular events in 2009 were both reported in

segment elevation myocardial infarction (STEMI) and age-related non-segment elevation myocardial infarction (NSTEMI) (9). Besides, some investigations had reported higher mortality rates among women with STEMI (10, 11). Thus, comparing the results of these studies with the findings of the related literature highlighted the role of age as a confounding variable in interpreting the results.

Age over 50 years, positive history of heart disease, typical heart pain, along with two factors of hospital evaluation (new ischemic ECG changes and troponin-positive) were also identified as factors with 100% sensitivity and 20.9% of predictive specificity of the CHD events within 30 days following the onset of symptoms (12). Moreover, the results of a study on 701 patients indicated that chest pain score greater than 11, age over 68 years, insulin-dependent diabetes, and a history of heart surgery were accompanied by serious short-term outcomes (13). Therefore, the findings of these studies were consistent with the results of the present study suggesting the role of old age and a history of cardiovascular diseases in predicting patient survival rates within one month.

The results of an investigation examining the relationship between pre-hospital delay time and short-term outcomes in patients with acute heart failure in 2011 also indicated that the time more than 45 minutes for the transfer of patients to healthcare centers was associated with the in-hospital mortality of patients (14).

Comparing the effect of history of smoking on the CHD mortality rates within one week and one month in the present study on chronic exposure to cigarette smoke in an inactive manner and the short-term outcomes (30 days) for hospitalized patients with acute coronary syndromes in Greece in 2007 on 1,003 patients exposed to such smoke showed a higher risk (61%) of the CHD events after hospital admission within 30 days following the onset of symptoms compared with those not exposed (15).

In an investigation in 2012; fear of death, sweating, as well as nausea were accompanied by decreasing 28-day mortality and increased syncope was associated with 28-day death. Presence of pain in the upper abdominal areas was also associated with reduced long-term mortality, shortness of breath, and increased mortality rates (16). In the present study; symptoms such as sweating and gastrointestinal discomfort as well as shortness of breath were accompanied by increased mortality rates within one week and one month.

The results of a study on 542,008 patients with myocardial infarction between 1994 and 2006 showed that, within the first manifestations of heart attacks, history of hypertension and smoking were considered as the most common factor and the lowest prevalence in this respect was associated with diabetes. History of diabetes and high blood pressure were also associated with higher rates of in-hospital mortality (17). In the present study, blood pressure and smoking were associated with increased mortality rates in the given population.

The findings of a study on gender differences in mortality rates following acute coronary syndrome also suggested that women with STEMI cases had higher 30-day mortality but they had lower 30-day mortality and unstable angina in the NSTEMI ones. Since the results were re-evaluated based on angiographic findings, no difference was found between women and men in terms of one-month mortality (18). The findings of this study were not in line with the results of the related literature in terms of increased chances of mortality in men three times more than that in women.

In the study on 2,172 patients, the incidence rate of acute coronary syndromes in men was three times more than that in women. The incidence rate of serious outcomes in both genders was also higher in the winter. Thus, the in-hospital mortality rate for women was higher than that in men. The 30-day mortality and readmissions in men and women were 17% and 16%, respectively. In total, women were older than men and spent more time between searches and getting their services; so, they were more likely to experience high blood pressure, obesity, and diabetes

compared with men. In contrast, men had higher rates of smoking and physical activities compared with women (19). The results of this study were also in agreement with the findings of the present study.

In another study, blood pressure was identified as an independent predictor of short- and long-term outcomes of mortality rates in patients with acute coronary syndrome (20) that was in line with the findings of the present study.

## Conclusion

Overall, it seems that important factors predicting and determining short-term survival (one week after the onset of chest pain) and moderate-term survival (one month after chronic chest pain) at the referral time included gender, age over 65 years, complaints about weaknesses, high blood pressure, presence of associated symptoms such as sweating, shortness of breath, and patient's medical history such as blood pressure, smoking, and taking aspirin. The given results were obtained after specifying the associated variables in a multivariate analysis of outcomes and then entering the data into a multivariate analysis in order to adjust the effect of each factor in the incidence of the outcomes.

The most important point in this study was attention to multivariate analysis and no satisfaction with the results obtained from the univariate analysis of possible predictors that had been less considered in the studies mentioned.

Using the pattern of history and lack of attention to para-clinical and diagnosis of enzymes among predictors of short- and moderate-term survival as the foundations of the study findings were also taken into account as some of the limitations in this study. Moreover, sample attrition due to the impossibility of sampling after the first phone calls was one of the other limitations of this study, so it was recommended to conduct a study using a sampling method rather than a census one in order to be able to better track the cases.

## Acknowledgements

We hereby sincerely appreciate the pre-hospital EMS in the city of Tehran as well as the operators and personnel who cooperated with us to conduct the present study.

**Table 1: Evaluation of the relationship between findings associated with patient's medical history as well as history of diseases in patients with mortality in the first week and between the first week and the first month after tracking within the study population**

Findings of patient's medical history	Outcomes within one week				Outcomes within one month			
	pre-hospital emergency		hospital		pre-hospital emergency		hospital	
	Statistic value	Significance level	Statistic value	Significance level	Statistic value	Significance level	Statistic value	Significance level
Weakness	259.40	0.000	227.64	0.000	354.59	0.000	311.96	0.000
Digestion	324.58	0.000	324.58	0.000	221.88	0.000	221.88	0.000
Blood pressure	106.12	0.000	98.02	0.000	160.86	0.000	148.81	0.000
Dizziness	18.14	0.001	17.57	0.000	24.76	0.000	24.159	0.000
Abdominal pain	23.53	0.000	23.53	0.000	32.287	0.000	32.28	0.000
Stroke	70.375	0.000	66.62	0.000	180.14	0.000	198.29	0.000
Asthma	3.06	0.22	3.16	0.21	4.054	0.132	1.338	0.507
Aspirin consumption	121.57	0.000	111.41	0.000	172.57	0.000	157.49	0.000
Smoking	24.44	0.000	18.89	0.000	25.2	0.000	27.08	0.000
Headache	25.42	0.004	19.29	0.001	20.72	0.000	21.11	0.000
Diaphoresis	26.7	0.000	26.7	0.000	44.29	0.000	42.91	0.000
Diarrhea	19.72	0.000	18.7	0.000	3.32	0.148	10.32	0.006
Cerebrovascular diseases	14.07	0.001	15.45	0.000	14.92	0.001	16.52	0.000
Vomiting	24.26	0.000	26.03	0.000	4.49	0.024	8.82	0.013
Shortness of breath	17.622	0.000	18.12	0.000	3.251	0.197	4.44	0.0103
Diabetes	10.4	0.005	9.87	0.007	2.109	0.335	2.65	0.266
Kidney diseases	10.76	0.003	11.32	0.003	4.89	0.86	5.22	0.073
Respiratory diseases	33.42	0.003	24.91	0.001	11.92	0.003	18.74	0.000
Mental illnesses	3.44	0.179	0.172	0.918	4.159	0.125	5.75	0.055
Allergies	25.11	0.000	25.11	0.000	0.75	0.69	0.75	0.69
Epilepsy	8.66	0.013	9.46	0.009	0.511	0.74	1.195	0.559
Surgery	29.91	0.022	17.72	0.000	29.91	0.000	19.12	0.000

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# Relationship between Mortality Rate of Patients with Acute Chest Pain and Time Trends of Request to Pre-Hospital Emergency Medical Services in Tehran, Iran

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## Abstract

**Background and objectives:** There are rhythmic periods in organisms' body influencing many of their conscious and unconscious activities. In most cases, these rhythms are in coordination with sun exposure time. Over hundreds of cycles and rhythms have been discovered in the human body, which have sophisticated mechanisms to regulate and change. The present study aimed to evaluate the relationship between mortality rate of patients and time trends of request to pre-hospital emergency medical services (PEMS) in Tehran, Iran.

**Material and methods:** In this cohort study with follow-up, 2,094 patients having inclusion criteria were selected among 7,432 requests to the emergency department in Tehran during a six-month period in 2012. The chosen variables were assessed through a researcher-made questionnaire. The relationship between time trends of patient's request and incidence of deaths caused by heart attack and survival of patient was evaluated and interpreted during this period.

**Results:** The findings of our study indicated an almost sinusoid rhythm in 8-hour cycle and an increasing rhythm from morning to night during a four-hour period and a certain elevation in the number of requests during night compared to the daytime. Within the 8-

hour cycle in the study population, the graph had three peaks at early morning, noon and late night. Difference in odds of dying between two genders was significant ( $p$  value = 0.021). Some age ranges showed different patterns of mortality.

**Conclusion:** Acute chest pain in patients appears to have a rhythmic pattern with a maximum incidence at late night and around noon. It seems that the major part of the obtained pattern is different from patterns of other countries.

**Key words:** Acute Chest Pain, Daily Cycle, Time Trends, Pre-hospital Emergency Medical Services

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## Introduction

There are rhythmic periods in organisms' body influencing many of their conscious and unconscious activities. The most common of these rhythms is circadian rhythm that repeats approximately every 24 hours. The circadian rhythm can be used to determine hormone levels, predict the risk of stroke, skin inflammation, body temperature, blood pressure and risk of death caused by cardiovascular events (1-3).

Studying the role of circadian rhythm in the incidence of acute coronary syndrome has risen by Muller et al. for the first time in 1985 [4]. Complementary investigations demonstrated that the most common incidence time of ischemic heart disease occurs in the morning between 6 am and noon 12 pm. The possible mechanism suggested for this rhythm proposes that in the early morning hours after awakening with the onset of physical activities and emotional stress, catecholamine secretion is enhanced which results in elevated blood pressure and heart rate; on the other hand, oxygen supply of cardiac tissue is decreased due to coronary vasoconstriction. Coinciding with the above-mentioned phenomena, platelet adhesion can be increased due to decreased physical activity. Collectively, these parallel and sequential processes cause a systematic approach in repetitions, which can be considered in prediction of the risk of acute coronary syndrome. Evaluation of the time related to the incidence of acute coronary syndrome is important to determine its time pattern based on circadian rhythm. It seems that if a certain process exists in the pattern of circadian cycle, it would be hoped that the incidence of myocardial infarction could be delayed or prevented by modifying this process (5).

Investigating the request pattern of patients with chest pain who call the emergency medical services could act as an approach capable of indicating the time trends of heart attack incidence. Evaluating the factors and backgrounds of cardiovascular diseases incidence plays a key role in the prevention and treatment of these diseases. On the other hand, identification of risk factors such as different incidence times of symptoms including different times of day, month and season of the year can serve as a warning sign for doctors to pay more attention and quickly respond to cardiovascular problems.

This study was designed and conducted to investigate the relationship between mortality of patients with acute chest pain and the incidence time pattern of acute coronary syndromes in Tehran's EMS department, and to determine the request time trends of request for help, to identify additional factors affecting the formation of this time pattern, and to employ the results of this study for choosing strategies of prevention and timely treatment in cardiovascular diseases.

## Materials and Methods

The present cohort study was carried out in a six-month period in 2012 to investigate the factors affecting the short-term mortality of patients with acute chest pain in collaboration with Tehran's EMS department; 3,229 patients with sudden chest pain were examined at different hours of the day.

Initially, technicians were investigated on how to record complaint of patients with acute chest pain calling Tehran's EMS. After determining the specified keyword of "heart disease", all recorded audio files of requests were collected. Out of the recorded 7,200 audio files in the six-month study period, 3,229 files met the inclusion criteria; 2,094 of these cases had one-month follow-up information in terms of survival or death, which were found to be suitable to enroll in the study and for collection of data.

Inclusion criteria were men and women over 45 years old with complaint of acute chest pain disseminated in the precordial or substernal regions for 20 minutes (or more) prolonged during the visit by EMS, without any other diagnosis justifying non-cardiac chest pain.

Exclusion criteria included deficiencies in the recorded information, patient's dissatisfaction with treatment in referred center and leaving there with personal consent resulting in uncertainty of illness outcome, death during delivery to the hospital or before arrival of ambulance and outpatient treatment at home.

In order to validate the accuracy of the data, 332 patients with available records in the archives of the hospital out of the 400 patients admitted to three selected hospitals, were studied to compare information extracted from their records with the information recorded by Tehran's EMS. After completing the checklists, the data obtained from the present study was entered into a computer and analyzed by SPSS software. The time of EMS call was calculated using descriptive statistical tests. The differences in studied variables among the different groups were analyzed by t-test and Chi-square in terms of being quantitative or qualitative, and the relationship between the defined factors and the rate of cardiovascular mortality within one week and one month after onset of symptoms was considered significant according to  $P$ -value < 0.05.

## Results

Overall, out of 3,229 eligible cases, 1,617 (50.1%) and 1,612 (49.9%) requests were related to men and women, respectively. Analysis of file-based mortality status demonstrated that 1,135 patients (35.3%) had an uncertain outcome, and mortality rate was 0.9% in the first week and 2.3% in the first month. Considering the uncertain outcomes, survival rate was 64% in the first week and 62.5% in the first month.

The mean age of participants was over 60 years and the mean systolic blood pressure in the first visit was in the border range and diastolic blood pressure was normal (Table 1).

**Table 1: Some quantitative characteristics of patients requesting help from pre-hospital EMS in Tehran, Iran (2012)**

Characteristics of patients	Gender	Mean	Lower limit of 95% confidence interval	Upper limit of 95% confidence interval
Age	Male	62.00	61.23	62.78
	Female	60.76	59.99	61.52
Systolic blood pressure	Male	135.93	134.74	137.12
	Female	135.03	133.90	136.16
Diastolic blood pressure	Male	78.16	77.35	78.96
	Female	77.68	76.92	78.45

**Figure 1: Frequency distribution radar chart for requesting help from pre-hospital EMS during 24 hours of a day in Tehran, Iran (2012)**

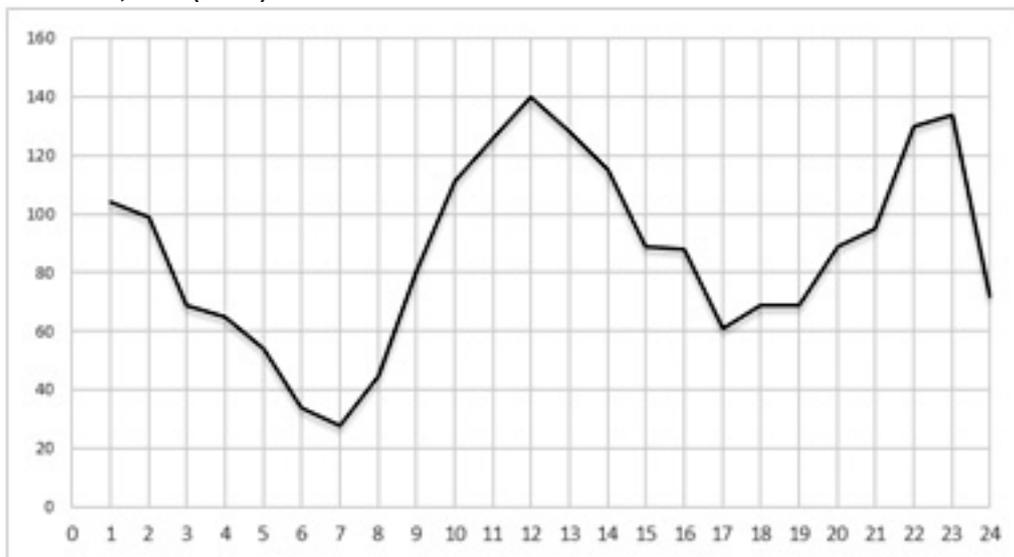


Figure 1 represents the 24-hour request pattern in 3,229 cases recorded with the primary complaint of chest pain. According to this figure, the highest requests for help are related to between 10 am to 2 pm, the second at 10 pm to 12 pm and the third at 1 am to 4 am. By dividing 24 hours into day (0:00 am-6:00 am) and night (6:01 am to 24:00 pm), the highest requests for help are related to day with 79.7%. By dividing 24 hours into four periods (with six-hour intervals), the highest requests for help were seen at 18:00 pm- 24:00 pm with 30.8%; the requests in the second place were found at 12:00 pm -18:00 pm with 27.8%. In dividing the 24 hours into six periods (with four-hour intervals), the number of requests was increased at late night (20:00 pm to 24:00 pm) with 20.6% and at noon (12:00 pm to 16:00 pm) with 20.1%. The highest mortality rate among the population in the first week of follow-up was in the age range of 80-84 years and then over 85 years. Totally, the highest number of deaths was observed respectively in 12:00 pm to 14:00 pm, 1:00 am to 2:00 am, 18:00 pm to 21:00 pm and 9:00 am to 10:00 am.

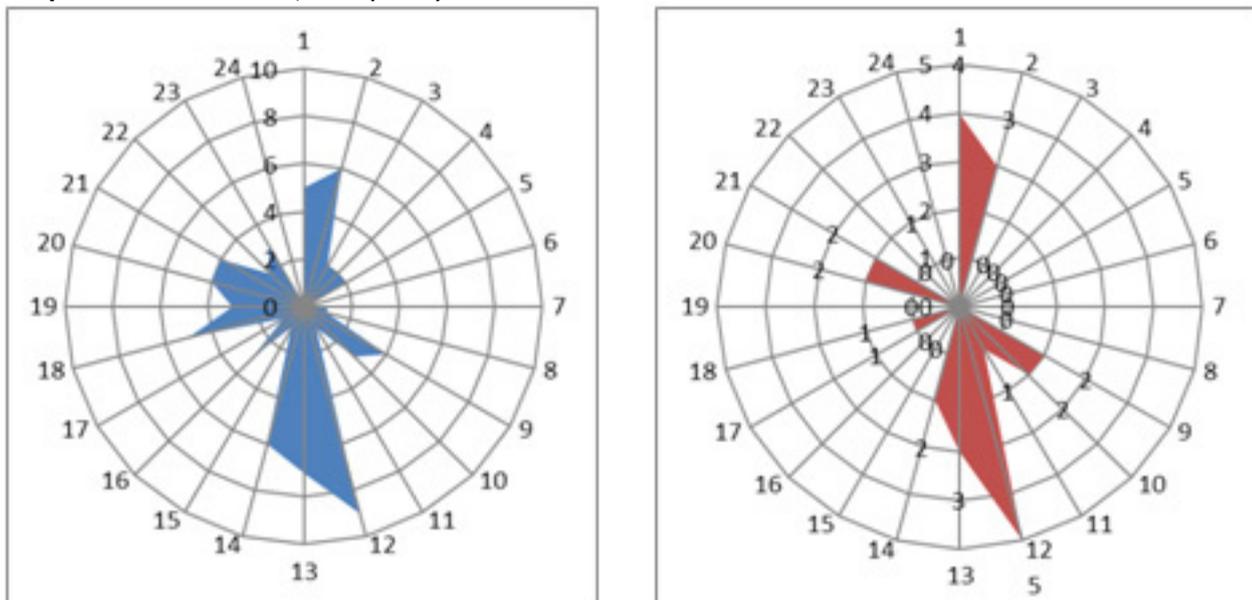
According to detailed reviews and studying the patients at an early stage of follow-up, the most EMS calls by dividing 24 hours into two periods were related to the nighttime; the request pattern in the first week and the first month in 24 hours is comparable (Figure 2). In the same group, most of the requests, by dividing 24 hours into four periods (with six-hour intervals) were associated with late night (18:00 pm to 24:00 pm) with 30.8%, and the second place was related to early afternoon (12:00 pm to 18:00 pm) with 27.8%. By dividing 24 hours into six periods (with four-hour intervals), the most requests for help were in late night (20:00 pm to 24:00 pm) with 20.6% in first place, shortly before noon (8:00 am to 12:00 pm) with 21.8% in at second place, and in the early hours of the afternoon (12:00 pm to 16:00 pm) with 20.1% in third place (Table 2).

Based on one-hour division of 24 hours, the highest number of requests for help was respectively at 12:00 pm, and then at 23:00 pm and 24:00 pm. Most of the requests (66.3%) were found in the age range of less than 65 years (Figure 2).

**Table 2: Relationship between mortality rates during four-hour periods a day (in the first week and first month) of the patients requesting help from pre-hospital EMS in Tehran, Iran (2012)**

Periods	At the end of the first week			At the end of the first month	
	Total	Survival	Dead	Survival	Dead
0:00 am to 4:00 am	337(100)	330(97.90)	7(2.1)	322(95.5)	15(4.5)
4:00 am to 8:00 am	161(100)	161(100)	0(0.0)	157(97.5)	4(2.5)
8:00 am to 12:00 pm	457(100)	447(97.8)	10(2.2)	440(96.3)	17(3.7)
12:00 pm to 4:00 pm	420(100)	415(98.8)	5(1.2)	403(96)	17(4)
4:00 pm to 8:00 pm	288(100)	284(68.6)	4(1.4)	275(95.5)	13(4.5)
8:00 pm to 24:00 pm	431(100)	428(99.3)	3(0.7)	422(97.9)	9(2.1)
Total	2094(100)	2065(98.6)	29(1.4)	2019(96.4)	75(3.6)

The obtained statistics on mortality were different in terms of gender and age of the patients. Most deaths caused by heart attack in the first week occurred in people older than 65 years, which has statistically significant difference (P value = 0.000). In the first month, the highest cases of cardiac death were in the patients older than 65 years and that has statistically significant difference (P value = 0.000). In the present study, significant difference was observed in mortality rate within one week and one month between women and men; so that it was 2% in men and 0.8% in women during one-week follow-up, and was 4.4% in men and 2.7% in women during one-month follow-up. The odds of dying were significantly different in two genders (P value = 0.021). The odds of dying specific for heart disease was elevated with increasing the rank of age range, which was predictable and represented the effect of symptoms and increased early mortality in these age ranges (Table 3).

**Figure 2: Frequency distribution of mortality in studied population based on one-hour periods during 24 hours of a day, (blue diagram in the first month and red diagram in the first week after requesting help from pre-hospital EMS in Tehran, Iran (2012))****Table 3: Frequency distribution of mortality in the first week after requesting help from pre-hospital EMS relative to population in Tehran, Iran (2012)**

Age group	Cardiac death in the first week				Cardiac death in the first month			
	Alive	Deceased	Population	Rate	Alive	Deceased	Population	Rate
45-49	(100) 467	(0) 0	536009	0.087	(100) 467	(0) 0	536009	0
50-54	(99.7) 339	(0.3) 1	459349	0.074	(99.7) 339	(0.3) 1	459349	0.002
55-59	(100) 225	(0) 0	352510	0.064	(98.7) 222	(1.3) 3	352510	0.008
60-64	(98.9) 267	(1.1) 3	247074	0.109	(96.7) 261	(3.3) 9	247074	0.036
65-69	(98.7) 148	(1.3) 2	181695	0.083	(93.3) 140	(6.7) 10	181695	0.055
70-74	(98.2) 218	(1.8) 4	137243	0.161	(94.6) 209	(5.4) 12	137243	0.087
75-79	(95.1) 154	(4.9) 8	101477	0.159	(88.3) 143	(11.7) 19	101477	0.187
80-84	(99.4) 161	(0.6) 1	61527	0.016	(97.5) 158	(2.5) 4	61527	0.065
+85	(89.7) 87	(10.3) 10	52801	0.189	(82.5) 80	(17.5) 17	52801	0.321
Total	(98.6) 2065	(1.4) 29	2129685	0.013	(96.4) 2019	(3.6) 75	2129685	0.035

## Discussion

In a study conducted on a Berlin medical service between 1987 and 1988, incidence time of respiratory distress symptoms, chest pain or loss of consciousness in patients with heart failure were studied based on age and gender. This study demonstrated that circadian variations in incidence of cardiopulmonary emergencies have maximum level between 6:00 am and 12:00 pm; this finding is inconsistent with the results of the present study. The remarkable point in this study that is somewhat consistent with the findings of our study is observing an increasing peak in patients with chest pain and respiratory disease in the evening or late daytime. The results of this study also indicated a higher mortality rate below 65 years old in the afternoon, and higher mortality rate in patients with age of 65 years in the morning. These ratios had no association with patient complaints and gender (7).

In a study conducted on 2,231 patients with acute myocardial infarction, the onset of acute chest pain was investigated during 12-hour and 6-hour periods. The results showed that the majority of symptoms occur between 10:00 am and 10:00 pm. The results of the present study are almost in line with this study (8).

There are several reports on the circadian pattern of myocardial infarction in diabetic patients. In research on 3,882 patients at 64 medical centers of the USA between August 1989 and September 1996, the patients with and without diabetes were studied and compared. This study revealed that increase in the incidence of acute myocardial infarction was in the early morning hours in both groups. In the present study, the most requests in patients with diabetes were related to noon between 10:00 am to 14:00 pm (9).

Mueller et al. (1985) investigated circadian cycle in myocardial infarction in the USA for the first time. A sharp rise in the numbers of pain onset was observed in the early hours of the morning (6:00 am). In 703 patients, the first increase in CK-MB level was considered as the onset time of myocardial infarction. Given that maximum cases of myocardial infarction in early morning hours were about three times more than late night, the increase in CK-MB level confirmed the impact of circadian rhythm (4). The results of this study are inconsistent with our findings.

In another study by Kinjo et al. (2001) in Japan entitled "effect of circadian rhythm variation on the incidence of acute myocardial infarction", the researchers examined the role of circadian rhythm changes in acute coronary syndrome within 6 periods of 4 hours a day, starting from 8:00 am. The highest incidence of the disease was observed in two periods of 8:00 am-12:00 pm (in the morning) and 20:00 pm-24:00 pm (at night). Assessments of subgroups demonstrated that the highest incidence in the early morning period included women over 65 years old. In addition, the highest incidence in the night period involved men less than 65 years old, employees and those who had a habit of smoking and alcohol consumption. Finally, the

researchers concluded that the risk of myocardial infarction in smoking and alcoholic young men is higher in the early hours of morning (10), which is less consistent with the results of our study in terms of the incidence time pattern of chest pain. The periodicity of the cycle of myocardial infarction incidence is in line with the results of the present study.

## Conclusion

The results of this study emphasize a certain circadian pattern in the patients with acute chest pain. Most of the requests were related to the nighttime and then around noon. In addition, the mortality of the age ranges in the morning and evening showed a different pattern in comparison with other studies. It made findings of this study different from other studies, indicating further attention to conduct better-organized studies.

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# An Investigation into the Effect of Listening to the Voice of the Holy Quran on Vital Signs and Consciousness Level of Patients Admitted to the ICU Wards of Zabol University of Medical Sciences Hospitals

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## Abstract

**Introduction:** Recent advances in medical sciences have increased the survival rate of injured patients and led to hospitalization of patients for a long time in the ICU wards. Patients admitted to special wards are confronted with considerable stress. Tension is usually associated with an increase in metabolic rate and, consequently, an increase in body temperature, in cardiac output and cardiac contractility, an increase in blood pressure, heart rate and respiratory rate. Therefore, the aim of this study was to investigate the helping effect of voice of the Quran on vital signs and level of consciousness in the patients admitted to the ICU wards”.

**Materials and Methods:** This study was a clinical trial. Thirty subjects were selected through random sampling method. For 10 consecutive days, Yousef Sura was played through a headphone for 15 minutes daily, and then physiological parameters, including systolic and diastolic blood pressure, respiration, pulse, and consciousness level were recorded by physiological indexes in two rounds, The first turn was 5 minutes before playing the Quran voice and the second one was immediately measured after completion of the Holy Quran broadcast. SPSS software version 22 was used to analyze the data.

**Findings:** Based on the results between the vital signs before and after the intervention, significant differences were observed ( $p < 0.0001$ ) in that the rate of vital signs declined after intervention. Additionally, there was a significant difference between the level of consciousness before and after the intervention ( $p < 0.0001$ ), increasing the level of consciousness after the intervention.

**Conclusion:** The results of this study show the effect of Quran verses on reducing vital signs and increasing the level of consciousness. Considering this easy and cost-free method, it can be used to provide an effective step in improving the conditions of patients admitted to special wards and for other patients suffering from tension and instability of vital signs due to various causes.

**Key words:** Quranic Voices, Vital Signs, Consciousness Level

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## Introduction

The Quran is a scripture of Muslims covering the entire dimensions of human life and naturally, treating illnesses can be one dimension of numerous dimensions of the Holy Quranic verses, and it is the duty of Muslim physicians to reveal the effect of this dimension (1). One of the aspects of the miracle of the Quranic scripture is to explain the truth not revealed to the scientists at the time of its decline, and the scientific advances in later centuries and ages have confirmed its correctness. The Holy Quran has many verses in the field of health and medical science, and it may be discovered in the future that we have not yet reached (2). Here are some of the Quranic verses on medical issues: attention to eating fruit and protein foods (Vagheha 20/21) and (Taur /22), birth pain relief (Maryam / 25), intensity of pain in the skin (Nesaa / 56), topical treatment of skin diseases in cold (p. 42), and its relationship with blindness (Yousef / 84), references to ulcerations due to immobility (Kahf / 18), psychological effect of the colour green (Rahman / 76), (Ensan / 21), and (Kahf / 31), ablutions and purity (cleanliness) of some parts of the body that are in contact with germs (Maedeh / 6), avoidance of overeating (Araaf / 31) harmfulness of sexual contact in menstrual cycle (Baghara / 222), hint to anxiety in aging (Nahl / 70), the healing effect of honey and its production by the female bee (Nahl / 69) (3).

In Quranic therapy, it has always been emphasized that the Quran is essentially effective in treating persons with various medical conditions. Since human beings have a holism with physical, spiritual and supersensible dimensions, and these dimensions cannot be separated, any intervention in one dimension will affect the other dimensions. In this regard, "prayer and spirituality" as a method of treatment have also been presented in other countries, so that in different studies, the therapeutic effect of them has been studied on improvement of diseases. These studies have been performed in cardiovascular patients, and patients with rheumatoid arthritis and neurovascular events (4, 5).

The Quran is a sound wave that has a specific frequency and wavelength, and this kind of wave produces oscillating strands affecting the brain cells and restoring their balance and harmony. These factors can increase the body's defense against diseases (6). The magnificent effect of this divine blessing on the treatment of pain is to the extent that some countries and communities have begun to pray and read the Quran in order to cure physical and mental illness of patients, as it has been scientifically shown that hearing the sound of the Holy Quran can reduce mental stress in humans (5).

Recent advances in medical science and improved care services have led to an increase in the survivability of injured patients, but these improvements have not completely guaranteed patients' return to pre-illness condition. This has led patients to be hospitalized for a long time in the ICU. On the other hand, admission is a stressful factor. Patients admitted to special wards are confronted with considerable stress. It is estimated that 30% to

70% of patients in ICUs experience severe physiological stress (7). Consequently, tension usually increases heart rate and increases the risk of arrhythmias. A number of physiological responses repeatedly observed in tension include increased metabolic rate and consequently increased body temperature, increased exertion and cardiac output, followed by increased blood pressure, heart rate and respiratory rate (8).

Currently, medications such as sedative medicines and analgesics are widely used to control the stress of patients in intensive care units. These drugs are expensive and have many complications, including weakening of the respiratory system and even death. Some studies have shown that the continued use of sedative drugs has delayed the separation of patients from mechanical ventilation and led to an increase in patient care costs (9). Today, much emphasis is placed on the use of complementary therapies in the health system, as complementary therapies have been called a psychological factor for relaxation in stressful situations (10). One of the complementary therapies is music therapy. Music therapy is a complementary therapy improving patients' well-being by increasing the threshold of stress and eliminating negative emotions, regulating internal processes, creating a relaxed state, enhancing the immune system, and helping the psychosocial, physiological and emotional integrity of the individual during treatment of disease and disability (7).

Extensive research has been conducted on music therapy. The results of these studies have agreed on reduced anxiety and a sedative state, but, with regard to the anti-anxiety effects of sedative music, the evidence is inconsistent with physiological indicators such as heart rate, respiration, and blood pressure. The results of Han et al. aiming at investigating the effect of relaxing music on physiological and anxiety indices in patients undergoing mechanical ventilation, showed that music decreased blood pressure, pulse rate and respiration (11). Meanwhile, Boy et al. in their study aimed to investigate the effect of relaxation music on physiological indices and relaxation in patients undergoing mechanical ventilation, and concluded that music had a significant effect on the relaxation of patients, but did not have a significant effect on physiological indices (systolic and diastolic blood pressures, respiratory rate and heart rate) (12).

One of the most beautiful voices is the beautiful sound of reciting Quranic verses as one of the most magnificent aspects of the miracle of the Holy Quran (2). The effect of listening to the Holy Quran on stressful and nervous individuals is such that 97% of these problems are reduced. Interestingly, these positive results were obtained, while many of these people were not even familiar with the Arabic language and did not understand the meaning of the verses.

However, by hearing the Quranic verses, they are relaxed, and this is due to the physiological effects of the Quran on their nervous system, since the human nervous system has been shown to respond positively to audio stimulus

with regular ups and downs (6). In Iran, several studies have been conducted on the effects of Quranic voices on patients in various fields and positive results have been obtained. For example, the results of the research of Ilder Abadi et al. (2003) ) in order to investigate the effect of Quranic voice on the vital signs of patients before surgery showed that there was a significant difference in heart rate and respiratory rate in the intervention group compared to the control group (13).

Since the auditory sensation is the strongest sensation of the five senses and is the last sensation working in the anesthetized ICU patients, and due to limited research in this field as well as attention to the culture and beliefs of the studied area, we have investigated the effect of helping via the Holy Quran voice, the vital signs and level of consciousness of patients admitted to the ICU wards of hospitals affiliated with Zabol University of Medical Sciences.

## Materials and Methods

The present study was a clinical trial and the study population included all patients admitted to the intensive care units of hospitals affiliated with Zabol University of Medical Science, which included the following inclusion criteria.

1. their families are satisfied with participating in the study.
2. The level of consciousness of the samples is 8-10 based on the Glasgow Comprehensive Standard
3. The hemodynamic status of the body is constant and stable in terms of water and electrolyte (these conditions are approved by the patient's therapist).
4. No hearing impairment.
5. Not receiving continuous intravenous sedative medicines.
6. Not hospitalized for more than one month.
7. No history of brain damage.
8. Not diabetic.
9. Not having cardiovascular disease and fat embolism.
10. Not having drug addiction.
11. Not having otorrhea .
12. Not having fracture or bleeding or neurosurgery in the temporal region.
13. Entering the study at least 24 hours after the stabilization of hemodynamic symptoms.

Exclusion criteria included:

- 1- Critical change in hemodynamic symptoms
- 2- Patient's death before the 10th day.

Finally, 30 people from the research community were selected by random sampling method and using the sample size formula. For 10 consecutive days, Yusef Sura was played with swinging rhythm for 15 minutes, daily via MP3 headphones, then physiological parameters, including systolic and diastolic blood pressure, respiration, pulse, and consciousness level were recorded by physiological indexes in two rounds. The first turn was 5 minutes before playing the Quran voice and the second one was immediately measured after completion of the Holy Quran broadcast.

Data were collected by demographic information-related questionnaire and disease questionnaire, physiological indexes registration form, Glasgow coma and biophysiological tools. The demographic information-related questionnaire included questions on patients' personal information, the history of reading, listening to the Quran, and information about the disease. Biophysiological tools included a mercury barometer, a stethoscope and a chronometer.

It is worth noting that GCS is the main tool for measuring the consciousness level of ICU patients, which is a standard tool and its validity and reliability have been confirmed. In order to increase the reliability of the biophysiological tools, these instruments were calibrated by one medical equipment engineer and then used. In order to analyze the data based on the assessment levels of variables, in addition to the descriptive statistics, inferential statistics methods were used, including parametric tests (T-paired) and non-parametric tests (the Mann-Whitney U test, the Kruskal-Wallis test, The Wilcoxon and Spearman correlation coefficient) by SPSS software version 22 .

## Findings

In this study, 30 people were evaluated. The mean age of these individuals was 42.36 and the mean level of consciousness was 8.04. Most people were male (70%) married (66.67%) and had a Quranic record (70%). The findings also indicate that diastolic blood pressure, heart rate, and respiratory rate follow a normal distribution, while systolic blood pressure and consciousness levels have no normal distribution.

The findings showed that the mean of vital signs (systolic, diastolic, heart rate and respiratory rate) decreased after intervention in comparison with the pre-intervention, showing a statistically significant difference ( $p < 0.0001$ ). Furthermore, the findings indicate that the mean level of consciousness after intervention was increased in comparison with the pre- intervention, and this difference in mean also has a significant difference ( $p < 0.0001$ ). (Table 1- next page).

In addition, the findings of this study indicate that there is no significant relationship between age, sex, marital status, Quranic history of patients with values of vital signs and level of consciousness after intervention ( $P < 0.05$ ). In fact, this finding suggests that the voice of the Holy Quran has influenced the vital signs and consciousness level of all individuals, even those who have not had a preceding record for the Quran.

**Table 1: Evaluation of vital signs and level of alertness of patients before and after intervention**

Variable	Before intervention	After intervention	Statistic Tests	P-value
	Mean±standard deviation	Mean±standard deviation		
GCS	9.11 ± 1,07	11.41 ± 1.12	Wilcoxon	< 0.0001
Systolic BP	131.14 ± 13.67	114.25 ± 13.03	Wilcoxon	< 0.0001
Diastolic BP	78.56 ±9.10	73.13 ± 8.58	T-Paired	< 0.0001
Heart rate	89.61 ± 8.86	75.87 ± 9.07	T-Paired	< 0.0001
No. of respiration	17.66 ± 1.61	15.15 ± 1.65	T-Paired	< 0.0001

## Discussion

The results of this study indicate that there is a significant difference between the mean values of vital signs before and after the intervention, and this difference is statistically significant ( $P < 0.0001$ ) so that mean systolic and diastolic blood pressure, heart rate and respiratory rate decreased after intervention, and GCS values increased after intervention.

Extensive research and investigation has been conducted on the miraculous effect of the Quranic verses on the treatment of physical and mental disorders and the modification of human health (7). The results of this study showed that listening to the Quranic verses is effective in reducing vital signs and increasing the level of consciousness in anesthetized patients in the intensive care unit (ICU).

Shirvani (2012) studied the effects of the Holy Quran on vital signs and arterial oxygen pressure in anesthetized patients admitted to the ICU ward and found that the Quran voice caused the patient's vital signs to stabilize and increased arterial oxygen pressure, being consistent with our research findings (14).

Moreover, Mir Baqer (2011) by comparing the effect of music and Quranic verses on the level of anxiety and vital signs of patients before abdominal surgery found that both music and Quranic verses had a positive effect on blood pressure, pulse rate and respiration, as well as anxiety level in patients. Thus, the Quranic voice is more effective which is consistent with the results of the present research (10).

Although the research on the effect of the Holy Quran on vital signs is limited, Majidi (2004) studied the effect of the Holy Quranic voice on the reduction of anxiety level before and after coronary angiography (2) and also Illderabadi (2001) by determining the effect of Quran audio on the level of anxiety before cardiovascular surgery (13) showed that those who listened to the Quran had lower levels of anxiety and more normal vital signs than the control group, being consistent with the results of the present study.

Keshavarz (2009) concluded in one study entitled "Investigation about the effect of Holy Quranic verse on physiological responses of premature infants who were admitted to the intensive care unit" that by playing Quranic verses, the pulse rate and respiration decreased in the intervention group compared to the control group. This result is also consistent with the results of our study (15).

In the field of music effect, there are different results. Nilsson (2008) stated that music stabilized vital signs (5). However, Wallace (2001) did not find any changes in blood pressure, pulse and respiration (16), which can be due to differences in the way patients are selected and the diversity in environmental and cultural conditions. The findings of this research reveal that listening to the Quran is effective in reducing blood pressure, pulse rate, and increasing arterial oxygen pressure in patients.

## Conclusion

In nursing practices, the Quranic voice as an effective intervention can be part of a patient's care plan, serving as a non-invasive treatment tool in order to improve hemodynamic status and physiological indicators of the patient. In addition, performing these actions by nurses is highly important for paving the way for achieving professional independence.

On the other hand, providing the Quranic verses is a cheap technique that does not require significant human resources. Therefore, the voice of the Quran can play a role as a nursing intervention in the care of patients admitted to the ICU. It was also shown that in this study, the Quranic voice could be effective in improving the physiological indices (blood pressure, heart rate and respiration), and the level of consciousness in patients, and since the critical changes of these indices in patients admitted to the ICUs place patients in critical conditions, therefore, it is recommended that the Quranic voice be used in conjunction with other therapies in intensive care units.

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# Comparative study on the effect of oral consumption of isotonic and water fluids on thirst, nausea and vomiting in patients undergoing coronary artery bypass surgery in the ICU unit of Cardiac Surgery of Kowsar Hospital in Semnan city

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## Abstract

**Introduction:** Thirst is one of the complications of cardiac surgery, an unpleasant experience and one of the causes of strong stress and anxiety in the first 24 hours after surgery. Thirst tolerance is very difficult for patients. The purpose of this study was to determine the effect of effective fluids on thirst, nausea and vomiting in patients undergoing coronary artery bypass graft surgery in patients admitted to the ICU of Cardiac surgery.

**Method:** This is a clinical trial in which 78 patients were examined in two groups of experiment and control. The experimental group was allowed to use isotonic fluids and the control group was allowed to use water after 1 hour after extubation up to 8 hours later. The data collection form included demographic and clinical data and the clinical score of thirst, nausea and vomiting. Data analysis was done using software (SPSS-23), descriptive statistical test, and repeated measures analysis of variance.

**Results:** According to the results, there was no significant difference in the two groups (experiment and control) in terms of thirst in 8 hours after extubation ( $p < 0.96$ ). Also, the severity of nausea was not significantly different between the two groups at any time after surgery ( $p < 0.94$ ). The P value for the two-domain Fisher test was 1 ( $p < 0.9999$ ) and the P value for the Chi-square Pearson test was close

to one ( $p = 0.94$ ), so the presence and absence of vomiting in the patients in the two groups in 8 hours after extubation had no significant difference.

**Conclusion:** By comparing the results, it is indicated that, in order to reduce the intensity of thirst, the severity of nausea and the reduction of vomiting after coronary artery bypass grafting, isotonic fluid is not different from water and it is necessary to find more effective oral liquids with fewer side effects, and that the current research is done with a higher sample number and with different fluids.

**Key words** isotonic fluid, isotonic dehydration, nausea, vomiting, thirst

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## Introduction

Cardiovascular disease is one of the most important causes of mortality in men and women around the world. Each year in Iran, 45% of all deaths are attributed to this disease (1) and it is the first cause of Iranian deaths (2). Open cardiac surgery is a common interventional treatment in this disease, and about 35 to 50 thousand cases of cardiac surgery are performed every year in Iran (3-4).

Patients undergoing coronary artery bypass graft surgery often have unstable hemodynamic status after being separated from the cardio-pulmonary pump. Failure to provide sufficient volume and fluids to the body can lead to systemic hypo-perfusion, tissue hypoxia and acidosis. On the other hand, patients undergoing endothelial circulation develop systemic inflammatory responses from the pump and cause endothelial damage, which, by increasing vascular permeability, leads to the interstitial edema of various tissues of the body and decreases blood volume. Therefore, proper and accurate replacement of intravascular volume in these patients needs special attention. Different views exist in determining the type of alternative solution, and researchers have cited various crystalloid and colloidal solutions in their papers. But there is always the question as to which solution is ideal. When using these solutions, not only their effects on hemodynamic status are considered, but also the side effects, inflammatory response, effects on vascular endothelial integration, and the effect on the function of various organs of the body, especially the kidneys, as well as effects on the electrolytes, osmolarity, acidity, and the coagulation status of the blood are important (5 and 20-22).

Thirst is one of the complications of cardiac surgery and an unpleasant experience after it and it is considered as one of the causes of strong stress and anxiety in the first 24 hours after surgery [8]. It is very difficult to tolerate thirst for patients so that hearing water and even washing the floor can make it more difficult to tolerate thirst (9). In the early hours of cardiac surgery, the control of fluid volume is precisely determined in order to prevent the increase of fluid in the extracellular space. On the other hand, the patient feels guilty for not complying with the permissible fluid intake (9 and 15).

Thirst is the most elemental sign in isotonic dehydration. And after thirst, a decrease in skin turgor, tachycardia, dry mucous membranes, dull eyes, lack of tears and oliguria appear (9). Clinical symptoms of isotonic dehydration appear when the volume of liquids is reduced to about 5% of body weight. If the deficiency of body fluids exceeds 10%, it can also lead to death due to vascular collapse (10). Correction and treatment of this condition is the compensation of injection or oral fluids (10). The injection of isotonic fluids, such as normal saline or serum ringer, is a fairly good choice to compensate for lost volume in dehydrated patients because sodium is not entered into the intracellular space and the above fluids are distributed only in the intravascular and interstitial tissues of the

patient (i.e. the injection serum will remain inside the plasma) (10).

Nausea and vomiting after cardiac surgery are a big problem for patients. Nausea and vomiting can cause aspiration, bleeding, wound closure, water and electrolyte imbalance, delay in recovery, prolonged hospital stay, increased intraocular pressure, increased intracranial pressure, fatigue, anxiety, discomfort, dissatisfaction, caring and increase the cost of hospitalization (11). On the other hand, hydration of the patient, especially in people who have been fasting for a long time, can be effective in reducing nausea and vomiting (13).

In recent years, after general anesthesia and after surgery other than gastrointestinal surgery, oral fluids were forbidden for about 4-6 hours, and this prohibition was to prevent general nausea and vomiting due to general anesthesia and the need for an NPO to be patient for the emergency time (8 and 15). However, studies have shown the benefits and health of consuming oral fluids after general anesthesia, such as quick return to normal diet, faster mobility, faster bowel movement, decreased thirst and increased satisfaction (8 and 15). Generally, from the review of literature, there is little information about the time of ingestion and some studies suggest that in children undergoing minor surgery, water can be consumed 1 hour after anesthesia and oral liquid therapy immediately after the recovery phase of general anesthesia can be harmless in surgery other than gastrointestinal surgery (8 and 15). Also, the incidence of nausea and vomiting in these patients has not been different from that of patients who had been fasting up to 4 hours after anesthesia (6, 18 and 19).

With regard to the above, regarding the time and how to commence the oral liquid after cardiac surgery, there is not enough information available. We studied the effect of isotonic fluids in comparison with controlled and free water in the treatment of thirst and to evaluate the complications of each of them in patients undergoing cardiac surgery, 1 hour after extubation.

## Materials and Methods

This is a randomized controlled clinical trial. In this study, there were two groups of experimental (test) and control and the effect of oral consumption of isotonic and water fluids on thirst, nausea and vomiting of patients undergoing coronary artery bypass surgery in patients admitted to the ICU unit of cardiac surgery in Kowsar hospital of Semnan was examined. The sample size was 78. The patients were selected by random sampling and randomly assigned to two groups of test and control group. In the test group, after 1 hour of extubation, patients can drink 100 cc of isotonic fluids for up to 8 hours. In the control group, patients can drink 100 cc of water per hour for up to 8 hours after extubation. These patients with the same conditions (anesthetic drug and duration of the same cardiovascular pump) have undergone cardiac arrest surgery in the Kowsar Medical Center of Semnan.

The data collection tool was a demographic profile including age, sex and type of surgery, and thirst and nausea of the patients based on NRS (Numeric Rating Scale) was examined. The NRS method is used in most studies to measure pain. This tool is also used in several studies to investigate thirst. The patients rate their thirst and nausea on a scale of 0 (without thirst or nausea) up to 10 (maximum value of the experienced thirst or nausea) (17-18). The method of evaluation of thirst in the NRS method was instructed to patients after extubation. The presence or absence of vomiting was objectively investigated by the researcher. The severity of thirst and illness was measured every hour for up to 8 hours after the onset of oral fluid therapy.

#### Inclusion criteria of the research

- Patients with coronary artery bypass grafts who had been under coronary artery bypass grafting
- In middle age (between 45 and 85 years old) and both genders can be studied
- The patient has provided informed consent to enter the study

#### Exclusion criteria of the research

- Having nausea and vomiting before taking fluids
- Receiving anti-nausea medicines
- Receiving liquids via NGT

Given that in diabetic patients undergoing surgery, BS was repeatedly checked and with insulin infusion in the first 24 hours, blood glucose was in the normal range, the presence of diabetes did not create a prohibition to enter the study.

The analysis of data was done using the SPSS23 software and based on the following models, statistical tests were used.

- Independent T test was used to “determine and compare the mean of thirst test between two groups of test and control.
- To determine and compare the mean score of nausea severity between two groups of test and control, independent t-test was used.
- To determine and compare the frequency of vomiting between two groups of test and control, Chi-square Pearson test was used.

## Findings

In this study, 78 patients were evaluated in two groups of test (39 subjects) and control (39 patients). The total number of samples was 84; 2 of them due to receiving metoclopramide after inoculation, 1 subject due to nursing mistake in the choice of fluid (in the patient who was consuming water, 1 time isotonic fluid was given and the patient subsequently had vomiting) and 2 subjects due to re-transfer to the operating room, were excluded from the intervention.

**Table 1: Distribution of patients in two groups based on demographic characteristics**

	Group	Water /number (%)	Isotonic fluids / number (%)	p - value
Gender	Male	28 (70%)	32 (84.2%)	0.13
	Female	12 (30%)	6 (15.8%)	
	Total	40 (100%)	38 (100%)	
Age	40-49	5 (12.5%)	4 (10.5%)	0.778
	50-59	14 (35%)	10 (26.5%)	
	60-69	13 (32.5%)	19 (50%)	
	70-9	8 (20%)	5 (13%)	
	Total	40 (100%)	38 (100%)	

As the table shows, 70% of the control group were men and 30% were women. In the test group, 84.2% of the samples were men and 15.8% were women. The two groups have the same gender distribution and have no significant difference ( $p = 0.13$ ). And the two groups had the same distribution in all age groups ( $p = 0.778$ ).

In terms of age, in the control group, 12.5% of the samples were 40-49 years old, 35% of the samples were 50-59 years old, 32.5% of the samples were aged 60-69 years old and 20% aged 70-79 years. In the control group, 4% of the samples were age 40-49-, 26.5%, age 50-59, 50% were 60-69, and 13% were 70-79. Chi-Square test was used to assess the consistency of the two groups in terms of sex distribution. The two groups had the same distribution in all age groups ( $p = 0.778$ ).

Table 2 shows the mean and standard deviation of the thirst intensity in patients in the two groups 8 hours after surgery. Mean and standard deviation of thirst intensity in experimental and control groups immediately after extubation were  $8.3 \pm 2.2$  and  $8.1 \pm 2.5$  with  $p = 0.69$ , respectively.

One hour later,  $7.2 \pm 2.7$  and  $6.7 \pm 2.7$  with  $p = 0.45$

Two hours later,  $6.7 \pm 3.3$  and  $6.2 \pm 3.1$ , with  $p=0.46$

Three hours later,  $5.8 \pm 2.7$  and  $5.1 \pm 3.1$  with  $p=0.24$

Four hours later,  $5 \pm 1.3$  and  $4.8 \pm 3.4$  with  $p=0.67$

Five hours later,  $4.3 \pm 3.2$  and  $4.2 \pm 3.7$  with  $p = 0.88$

Six hours later,  $3.8 \pm 3.3$  and  $3.6 \pm 3.7$  with  $p = 0.86$   
 Seven hours later,  $3.4 \pm 3.1$  and  $3.3 \pm 3.1$  with  $p = 0.81$   
 Eight hours later,  $3.1 \pm 3.1$  and  $3.1 \pm 3.7$  with  $p = 0.95$

The two groups did not have a significant difference in thirst for each of the 8 periods.

**Table 2: The mean and standard deviation of thirst intensity in patients in the two groups 8 hours after surgery**

Time (Hour)	Thirst intensity		p - value
	Water Mean $\pm$ standard deviation	Isotonic fluids Mean $\pm$ standard deviation	
Immediately after extubation	$8.1 \pm 2.5$	$8.3 \pm 2.2$	0.69
1	$6.7 \pm 3.2$	$7.2 \pm 2.7$	0.45
2	$6.2 \pm 3.1$	$6.7 \pm 3.3$	0.46
3	$5. \pm 3.1$	$5.8 \pm 2.7$	0.24
4	$4.8 \pm 3.4$	$5.1 \pm 3$	0.67
5	$4.2 \pm 3.7$	$4.3 \pm 3.2$	0.88
6	$3.6 \pm 3.7$	$3.8 \pm 3.3$	0.86
7	$3.3 \pm 3.1$	$3.4 \pm 3.1$	0.81
8	$3.1 \pm 3.1$	$3.1 \pm 3.7$	0.95

**Table 3: The mean and standard deviation of severity of nausea in patients in the two groups 8 hours after surgery**

Time (Hour)	Nausea intensity		p - value
	Water Mean $\pm$ standard deviation	Isotonic fluids Mean $\pm$ standard deviation	
Immediately after extubation	$0.55 \pm 2.2$	$0.18 \pm 1.1$	0.36
1	$0.33 \pm 1.6$	$0.13 \pm 0.8$	0.51
2	$0.15 \pm 0.6$	$0 \pm 0.0$	0.16
3	$0.10 \pm 0.6$	$0 \pm 0.0$	0.33
4	$0.38 \pm 1.7$	$0.08 \pm 0.48$	0.31
5	$0.10 \pm 0.6$	$0.26 \pm 1.6$	0.55
6	$0.10 \pm 0.6$	$0.34 \pm 1.6$	0.39
7	$0.13 \pm 0.79$	$0.05 \pm 0.32$	0.60
8	$0.38 \pm 1.7$	$0.34 \pm 1.6$	0.93

Table 3 shows the mean and standard deviation of severity of nausea in patients in the two groups within 8 hours of surgery. Mean and standard deviation of severity of nausea in experimental and control groups immediately after extubation were  $0.18 \pm 1.1$  and  $2.2 \pm 0.55$  with ( $p$  value = 0.36), respectively.

One hour later,  $0.13 \pm 0.8$  and  $0.33 \pm 1.6$  with  $p = 0.51$   
 Two hours later,  $0.6 \pm 0.0$  and  $0.15 \pm 0.6$ , with  $p=0.16$   
 Three hours later,  $0 \pm 0.0$  and  $0.10 \pm 0.6$  with  $p=0.33$   
 Four hours later,  $0.8 \pm 0.48$  and  $0.38 \pm 1.7$  with  $p=0.31$   
 Five hours later,  $0.26 \pm 1.6$  and  $0.10 \pm 0.6$  with  $p = 0.55$   
 Six hours later,  $0.34 \pm 1.6$  and  $0.10 \pm 0.6$  with  $p = 0.39$   
 Seven hours later,  $0.05 \pm 0.32$  and  $0.13 \pm 0.79$  with  $p = 0.60$   
 Eight hours later,  $0.34 \pm 1.6$  and  $0.38 \pm 1.7$  with  $p = 0.93$

Based on the above values, it can be concluded that the severity of nausea was not significantly different between the two groups at any time after surgery.

**Table 4 Vomiting status in patients in two groups within 8 hours of surgery**

Vomiting	Group		p - value	
	2 Isotonic fluids Number (%)	Water Number (%)	Pearson Chi	Fisher
Has	3 (7.5%)	3(7.8%)	0.984	>0.999
Hasn't	35 (92.2%)	37 (92.5%)		
Total	40 (100%)	38 (100%)		

Table 4 shows the vomiting status in patients in the two groups within 8 hours of surgery. The vomiting rate was 7.8% in the experimental group and 7.5% in the control group and lack of vomiting was 92.2% in the control group and 92.5% in the control group. Based on these values, the p values for the two-Range Fisher test was one. There was no significant difference between the two groups ( $p < 0.9999$ ). In addition, the p value for the Chi-square Pearson test was also close to one, which confirms insignificant difference between the two groups ( $p = 0.94$ ).

## Discussion

In a study by Oktay, the first group was allowed to drink regular fluids after transferring the patient to the recovery room. In the second group, until 1 hour after dispensing (discharging) and in the third group up to 2 hours after discharge, the patient remained NPO. There was no significant difference in the frequency of nausea and vomiting in the three groups (16). As it is seen, Oktay's study results are consistent with the current study.

In Yin's study titled 'Early onset of oral fluid intake after general anesthesia', 500 patients received water 4 hours after general anesthesia, and 500 patients consumed 0.5 cc / kg of water after improving in the anesthetic phase. 20 minutes after water intake in the second group, the incidence of vomiting was very low and no significant differences were observed at the same time ( $p > 0.05$ ) (14). That was consistent with the recent study.

In Radice's study (54 patients in two groups after cardiac surgery) the first group could not drink water, and the second group consumed free fluids after 1 hour of extubation. The information showed that drinking water after 1 hour after extubation without significant increase in the occurrence of nausea, has a positive effect on thirst (15), and that the intensity of thirst was inconsistent with the current study in terms of severity of nausea.

The study of Ramezani and Najafi in two groups of control (only essential fluid intake) and intervention group (intake of essential fluids plus 10 ml / per 1 kg body weight of Ringer serum) showed that the incidence of nausea and vomiting was significantly lower in the intervention group and moderate fluid therapy reduced the incidence of postoperative nausea and vomiting. Regarding the intake of oral liquids in addition to intravenous fluids in the current study, the reduction in incidence of nausea and vomiting was consistent in both studies (17).

Considering that in similar articles, the incidence of nausea and vomiting after coronary artery bypass surgery was estimated to be 42% - 47% and after general anesthesia was 16% and 36%, it was believed that the incidence of nausea and vomiting was high and the study was effective in this regard. But in the Kowsar Hospital of Semnan, the

incidence of nausea and vomiting was very low and about 6%, which was not a valuable subject for research.

## Conclusion

In relation to the research hypothesis that "the mean of thirst score in the test group is different with the control group", the results of the t test for thirst did not show a significant difference between the two groups of the test and control during the 8 time periods ( $p < 0.96$ ). Therefore, the research hypothesis was not accepted (confirmed). Also, in the hypothesis "frequency of nausea in the test group is different with the control group", according to ( $p < 0.94$ ), it can be concluded that the severity of nausea was not significantly different between the two groups at any time after surgery. Therefore, the research hypothesis was not accepted (confirmed).

The third hypothesis states that "the frequency of vomiting in the test group is different to the control group", which is due to the fact that the P value for the two-domain Fisher test was one, thus there was no significant difference between the two groups ( $p < 0.9999$ ). In addition, the P value for the Chi-square Pearson test is also close to one, which confirms the insignificant difference between the two groups ( $p = 0.94$ ); as a result of this hypothesis is also rejected.

In this study, we concluded that in order to quench the thirst after coronary artery bypass surgery, isotonic fluids have no advantage over water in terms of thirst and reduced fluid intake side-effects, such as nausea and vomiting. And water and isotonic liquids are similar in relieving the severity of thirst and the low degree of complications.

## Application of the findings

In order to relieve thirst in various conditions such as post-fasting, after surgery, in long-term thirst, in athletes and people who are forced to remain in the heat for a long time it is always a question of what is the best oral liquid to relieve thirst. The findings of this study showed that there is no difference between water and isotonic fluid in thirst quenching. And in cases where quenching the thirst with edible liquids is very important, the use of water and isotonic fluids is in the same position.

The matters and results obtained in this study suggest that in the absence of water, it is possible to use isotonic fluids such as lemon juice, honey, juice, etc. to relieve thirst. Because of no significant difference in thirst, nausea and vomiting, this study showed that oral isotonic fluids can be a good alternative to water.

Since oral isotonic liquids in terms of quenching thirst and complications such as nausea and vomiting is similar to water, it can help to quench thirst in certain conditions, such as water poisoning.

### Study Limitations

The effect of anesthetic drugs can make the patient unable to score a thirst and nausea after extubation. It might also be better to complete thirst-quenching, liquids are given to patients and the time for complete thirst quenching thus achieved. But due to the fact that after 8 hours, the patient's diet became commonplace, it interfered with oral rehydration and thirst-quenching. Therefore, the thirst was measured up to 8 hours after extubation.

### Suggestions for next research

Considering that with a sample size of 78 patients, the difference in the intensity of thirst was not significant in experimental and control groups, it is recommended that this study be carried out with a higher number of samples and with numerous isotonic fluids, including lemon juice-honey. Also, due to the low incidence of nausea and vomiting in Semnan Kowsar Hospital, it is recommended to repeat this research in treatment centers with a high rate of nausea and vomiting incidence. In addition, in similar studies, the volume of fluids consumed by the patient before thirst can also be recorded and examined, in order to identify the fluids that can quench thirst with less volume. Also, despite the fact that the NRS chart in some studies has been used to measure thirst, but due to the effects of anesthetic drugs, it is better to use a different method in this regard.

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# The Effect of Massage of Hugo Point on Severity of Pain in Patients Undergoing Laparoscopic Cholecystectomy: a Randomized Clinical Trial

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## Abstract

**Introduction & Objective:** Tissue injury after surgery produces painful sequelae. Environmental factors can also be effective on a patient's pain. In most pain control pharmacological methods are used but they can be associated with various complications. Use of complementary medicine and non-pharmacological methods for reduction of pain is considered a simple, effective method, and often without specific complications, but despite the many benefits, few studies have been conducted on clinical effects. So this study was performed with the aim to determine the effect of massage of Hugo point on severity of pain in patients undergoing laparoscopic cholecystectomy.

**Methods and Implementation procedure:** The present research was a clinical trial study. The sample size of this study included 52 patient candidates for laparoscopic cholecystectomy who were eligible for inclusion in the study. Sampling was conducted in surgical wards of Shahid Beheshti Hospital, Shohadaye Gorname Hospital and Razi Surgery Center of Yasuj city. Samples were divided into two groups based on random allocation blocks. Data collection tools included questionnaires of demographic information, vital signs Check list and numerical scale measurement of severity of pain. Interventions related to each group were conducted based on intervention protocol and based on compliance guidelines (six times measurements for each group). Data, after gathering, were investigated and compared by SPSS software, version 20 and by descriptive statistics (mean, standard deviation) and analysis test (Wilcoxon, Kruskal-Wallis and Tukey).

**Findings:** Results of this research indicated that the effect of massage of Hugo point on severity of pain in patients, was effective and in all six interventions and measurements resulted in a considerable significant reduction of pain compared to pre-intervention. Also, the comparison with the control group was significantly different, so that on a numerical scale the survey severity of pain was 0-10, mean of severity of pain at the end of study in the control group was 7.1 to 4, and in massage group reached from 7.7 to 1.3. Although in both groups, the severity of pain was reduced, this reduction in the intervention group compared to the control group was more prominent.

**Conclusion:** According to the results of this study performing intervention massage of Hugo point lead to effectively and significantly reduce pain in comparison with the control group, in patients undergoing laparoscopic cholecystectomy. Therefore, it is suggested massage of the Hugo point as part of nursing interventions and side interventions and routine care nursing should be used.

**Key words:** Massage, Hugo point, Pain, Cholecystectomy

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## Introduction

Surgical procedures and tissue injury cause reactions in the body, such as production of pain-causing materials such as prostaglandins, Bradykinin, hydrogen ions, lactic acid, and serotonin. This material stimulates pain receptors chemically and those that have the greatest impact are prostaglandins and Bradykinin(1). Patients experience the highest severity of pain in the first 48 hours after surgery. Studies indicate that 20 percent of patients have mild pain, and 20-40% moderate pain, and 40-60 % will experience severe pain (2). Nowadays pain in nursing care, is one of the most important nursing diagnosis and basic nursing concepts discussed (3). Effective management of pain, which includes prevention, control and pain reduction is an important standard and priority in nursing care(4). Pain after cholecystectomy surgery is also important for nursing diagnosis and investigation and its relief is one of the main goals of nursing. Because nurses spend most time with patients and in relation to investigation and control of pain, and performed provision of care and other nursing acts such as palliative care measures, including bringing routine sedative drugs and non-pharmaceutical control for relief of patient's pain and then evaluation of the effects of these measures in order to ensure an acceptable level of pain relief for patients(5). Providing quality nursing care and suitable care, especially in relation to pain control of patients, nurses have a significant effect on reducing the repetition and severity of pain in the patient and consequently accelerate the recovery process(6). In a similar focus the American Pain Society has called pain the fifth vital sign and have labeled 2001 to 2010 the decade Pain Control(7). In addition, the World Health Organization has also set up a Commission under the name the Joint Commission for accreditation of Healthcare Organizations and has announced that from the time of admission to discharge of patients, pain should be continuously monitored and (6). Because, effective pain control increases the satisfaction of patients, facilitates rapid recovery and return to previous levels of function, reduces the symptoms of disease and the facilitates earlier patient's discharge (8).

Usually, pain control in surgical patients involves sedatives and opioids. Medicinal pain control involves the non-narcotic, and non-steroid therapy, although analgesic therapy is the strongest tool available (8). Approximately 9-15% of cases of drug use is associated with drug reactions, and 10-20% of the hospitalizations are caused by harmful drug reactions(9). Ample research indicates inadequate pain management even with the existence of the research in recent decades and the availability of effective analgesics and available, there are still a large number of patients with mild to severe pain(10). This indicates that sedatives and opioids drugs alone cannot always provide appropriate pain relief. Therefore, non-pharmacological methods of pain relief that emphasize on an intervention which causes distraction, relaxation, relieves anxiety and thus reduces the perception of pain may be useful(11).

Acupressure is included among these non-pharmacological methods of decreasing pain without the use of special equipment and it can be done with just the hand. I

Acupressure uses stimulation of points by Needle therapy, using pressure and massage (12). The evidence, indicates that this method, will decrease and relieve chronic pain of the waist and neck (13, 14). With massage large fiber stimulation with neural impulses that transmit to the spinal cord may be provoking. If this stimulation is continuous it can cause a 'closed gate of pain transmission' and as a result reduction of pain sensation will (14, 15). Also, research clearly suggested that ice-cold (which applies in the massage of Hugo point) can block the sensory fiber(16). On the same basis, the researchers indicated that massage in that area with connection between the thumb and finger (Hugo point) in 50% of cases causes reduction of severe dental pain (which is an acute pain)(12).

So with respect to cases previously mentioned in the field of complementary medicine done by nurses with limited studies, especially in Iran and in particular studies of massage techniques of Hugo point are limited, so the present study was designed and aimed to determine the effect of massage of Hugo point on severity of pain of patients undergoing laparoscopic.

## Methods

The present study is a randomized clinical trial, which is registered with code IRCT2016021126522N1 in the Iranian clinical trials website. Sampling done was cross-sectional and was carried out from April till July 2016. Patients undergoing laparoscopic cholecystectomy surgery were studied for the impact of the intervention. Samples were selected from those who met the with inclusion. Then samples were divided into two groups based on random allocation.

With the use of similar studies (17, 18), and tables of estimate the sample size in the analysis of variance with the below parameters was done:

$$P_1=0/85, P_2=0/5, \alpha=0.05, \beta=0.2.$$

$$N = \frac{(Z_1 - \frac{\alpha}{2} + Z\beta)^2 \times P_1(1-P) + P_2(1-P_2)}{(P_1 - P_2)^2} = 24=25$$

Study was executed after obtaining the confirmation of the University Ethics Committee and providing a biography written to the sectors of surgery, Shahid beheshti hospital, Shohadaye Gomnam hospital and Razi's surgical Center. For sampling, cases were identified from patients hospitalized in surgery wards who were to undergo laparoscopic cholecystectomy surgery and who met the inclusion criteria were identified. Each sample was informed about the purpose of the and after obtaining written permission from the patient and giving assurance to the patient that they would not be harmed nor would the study interfere in the process of their therapy, then the study commenced. Inclusion criteria included surgery by laparoscopic procedure, good health in the hands of the participant, especially the thumb, having rated severity of pain as average and higher (based on the numerical severity of pain scale, 3 and above), not in a clinical job, having attained full consciousness after surgery, not

addicted to illicit drugs, sedatives and alcohol, lack of hearing impairment, lack of experience in the use of the massage of Hugo point, lack of chronic pain in other parts of the body, such as migraine and backache.

Before going to the operating room the required variables and forms were completed. After six hours from leaving the operating room the samples were interviewed, forms were completed and the desired variables were evaluated. To create the same conditions for the interventions and for the privacy of patients, curtain were drawn around the beds.

Data collection tools included demographic information questionnaire, vital signs record forms and numerical pain scale. Demographic information questionnaire was in two parts. Part I was on demographic characteristics and part II information related to the disease. A numerical scale was used to assess and measure pain severity of patients. Studies have shown that a numerical classification scale for assessing the severity of pain has a good reputation and is frequently used in different research. The numerical scale for assessing pain, used 10 grades scaled that a score of ten for the most intense pain and a score of zero, was considered painless. Based on this scale, the patients, according to their current state determined severity of their pain on a ten-point scale. The numerical tool was the most commonly used tool for measurement of pain. In addition, this scale has good validity and reliability. The most important feature of these tools is ease of use. Achieving a score of 1-3 reflects mild pain, 4-7 moderate pain, and 8-10 represents severe pain(19). In numerous studies validity and reliability of this tool has been confirmed (20). In Iran, the coefficient of reliability of this scale with correlation coefficient  $r = .88$  has been confirmed(17). In another study, the level of validity and credibility of this scale was estimated at about about .76 and its reliability was determined by different methods from 0/77 to 0/84 (18, 21).

Interventions on male patients was done by a male researcher and female patients by a female researcher on the basis of the intervention protocol. In total, six interventions were performed. Interventions were done at approximately 6, 12, 24, 36, 48, and 60 hours after surgery. Severity of pain was measured before and after each intervention. In order to perform the massage we asked of the patients to be put in an arbitrary position. To do the intervention, researcher's faced the patient and at the times when the patient's pain was a t a score of 3 on the numerical pain measurement scale, the researcher placed their own right hand thumb on small bags of ice and pushed it on the right hand Hugo point of the patient with continuous pressure. To prevent creating discomfort, from the pressure of deep-rolling around the Hugo point and to some extent creation changed color of the nails being applied by the researcher. This action was repeated three times, and then severity of pain of patients measured (after 30 minute interventions). To check the suitability of the time and be effectiveness each time the following list of emotions were enquired about including a feeling of

warmth, numbness, anesthesia, pain, heavy and peace. Interventions continued for three days and six interventions were done.

The collected data was encoded and entered in software SPSS IBM under Windows version 20 and through descriptive statistics, such as tables, and central and dispersion indices. Also according to non-normal data distribution of the statistics test such as Kruskal-Wallis, will Kaksoon and Tukey for analysis and comparison within the -group and between groups of intensive pain. Confidence intervals were at 95% &  $p < 0.05$ .

## Findings

There were no significant difference between the two groups reviewed in demographic and context variables ( $P > 0.05$ ) and both groups were matched (Table 1). There was no significant differences in severity of pain of patients before doing the surgery in both groups studied ( $p < 0.05$ ). After the surgery the patients severity of pain increased (Chart 1 - page 91).

In comparison within the group, reducing the severity of pain was observed and the reduction in the intervention group in all 6 interventions was

statistically significant (Table 2). The severity of pain in the intervention group compared to the control group was significantly less and this difference was statistically significant ( $p < 0.05$ ), (Table 3).

It also outlines that it greatly reduced the pain over time. But this reduction in the intervention group (massage of Hugo point) was dramatically and statistically more than in the control group ( $p < 0.05$ ). The average severity of pain at the end of the study compared with the beginning of the study in the control group fell from 7.1 to 4 and in the massage group fell from 7.7 to 1.3.

## Discussion and Conclusions

The results of this study support doing intervention massage of Hugo point six times to cause a significant decrease in severity of pain compared with the control group. Studies have shown that the mechanism of the effect of massage of the Hugo point in pain relief is caused by increased secretion of endorphins in patients(22). The practice should be done with the presence of a researcher at the bedside of the patient because pain often is subjective and influenced by psychological factors and feelings. The presence of the researcher by the bed can reduce its severity.

The positive effects of massage on the other studies have been observed. In study of Abdul-Aziz and Mohammed (2014) they found massage therapy after surgery effectively reduces the severity of the pain in patients(23). The results of another study also showed that massage increases the secretion of endorphins and reduces the amount of pain in

**Table 1: Comparing the mean of background variables in the two study groups**

group	variable	BMI	weight	height	age
Hugo point massage	Mean ± SD	26.6±3.4	73±8.4	166±5.2	47±12.7
control	Mean ± SD	27.3±3.1	76±8.1	167±6.3	49.5±10.5
Chi-square	x2	1.6	6.6	3	2.4
	P-value	0.443	0.36	0.214	0.3

**Table 2: Comparing the mean, the standard deviation And mean Rank of pain severity in groups**

group		T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Hugo point massage	mean ± SD before	6.5±1.2	7.7±1.7	6.8±1.1	5.3±1	4.5±1	4±1	3.5±0.5
	Mean ± SD after	7.5±1.7	5.9±1.6	4.4±1.3	3.1±1.4	2.5±1.2	2.3±1.3	1.3±0.5
	mean rank of negative change	0	13.5	13.5	13	13	13.5	14
	mean rank of positive change	6	0	0	0	0	0	0
	Negative change	0	26	26	25	25	26	27
	Positive change	11	0	0	0	0	0	0
	No change	16	1	1	2	2	1	0
	Z	-2.9	-4.5	-4.5	-4.43	4.4	-4.5	-4.5
	p-value	0.003	0.001	0.001	0.001	0.001	0.001	0.001
Control	mean ± SD before	6±1	4.1±1.7	6.5±1.4	6±1	6±1	5±1.5	4±0.8
	Mean ± SD after	7.1±1.7	7±1.7	6.5±1.4	5.9±1	6±1	4.8±1	4±1
	mean rank of negative change	0	1	0	0	0	0	0
	mean rank of positive change	10.5	0	0	0	0	0	0
	Negative change	0	1	0	0	0	0	0
	Positive change	20	0	0	0	0	0	0
	No change	5	24	25	25	25	25	25
	Z	-3.9	-1	0	-0.8	0	-1	0
	p-value	0.001	0.317	1	0.889	1	0.120	1

(Comments: T<sub>0</sub>: Comparison of pain severity before surgery with 6 hours after surgery. T<sub>1</sub>-T<sub>6</sub>: Comparison of pain severity before and after interventions)

**Table 3: Compare the Mean of pain intensity in the two groups in post hoc Tukey test**

group	variable	BMI	weight	height	age
Hugo point massage	Mean ± SD	26.6±3.4	73±8.4	166±5.2	47±12.7
control	Mean ± SD	27.3±3.1	76±8.1	167±6.3	49.5±10.5
Chi-square	x2	1.6	6.6	3	2.4
	P-value	0.443	0.36	0.214	0.3

patients(22). A further study also indicated that after doing massage reduction of the rate of pain in the massage therapy group compared with the control group was very obvious(24). The results of the another study where the aim of investigation was the effect of hand massage on patients who had undergone surgery showed that the mean severity of pain reduced from 4/64 to 2/35 and that the rate of difference before and after the intervention was statistically significant. (25). The results of another study was to examine the impact of ice massage on pain of childbirth and indicated that ice massage on the Hugo point reduces the severity of the pain of childbirth(12). Influence of foot reflection massage on abdominal pain and chest surgery has been investigated. The outcomes of the results suggest that use of foot reflection massage can reduce the severity of pain in chest and abdominal surgery patients and reduces their need for effective analgesic drugs

and Pethedine(26). The results of another study conducted by Rakhsheshkorshid et al (2013) showed that the use of Acupressure causes a significant decrease in severity of pain of indysmenorrhea, in the intervention group compared to the control group(27). Therefore it seems the techniques such as massage therapy, can make simple, effective and important impacts on pain reduction in patients.

To the best of our knowledge, this is one of the very few studies that describe the benefits of implementing Hugo point massage therapy to pain relief in cholecystectomy patients. Therefore it can be said that the present research on Hugo point in the massage group compared to the control group, lessened severity of pain. Although in this study, the results of research suggest that pain lessened over time in both groups, reduction of the severity of the pain, in the intervention group

was more than in the control group. Since recovery from pain accelerates in healing this shows the importance of the application of complementary medicine at the patient's bedside. Finally, with regard to this methods such as massage of Hugo point is a very simple, cheap, and available intervention and is safe and with no side effects so it can be an appropriate option for reducing the pain of surgery, alongside the standard treatment and routine nursing care and palliative.

### Acknowledgement

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# Years of potential life lost in the south of Iran in 2011 and 2015: A population-based study

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## Abstract

**Introduction:** “Years of potential life lost (YPLL)” index is utilized to determine lost social and economic burdens in a population because of premature death due to various causes. This study aimed to determine the YPLL due to premature death in Jahrom County in 2011 and 2015.

**Method:** This study was cross-sectional and conducted through a secondary data analysis of Jahrom County in 2011 and 2015. Excel Template software of the World Health Organization (WHO) and standard Coale-Demeny “West” Model Life Table, levels 25 and 26, which estimated life expectancy (LE) at birth in 82.5 year old females and 80 year old males, were used to calculate the YPLL.

**Results:** Results indicate that cardiovascular diseases (35.5%), transportation accidents (6.8%), and cancer and tumors (6.4%) were three main causes of death in 2011, and cardiovascular diseases (38.4%), cancer and tumors (11.1%), and transportation accidents (6.6%) were respectively the leading causes of death in 2015. Furthermore, 26,491 years in 2011 and 19,262.5 years in 2015 were lost due to premature death in 2011; and conditions originating in the perinatal period, cardiovascular diseases, and transportation accidents were respectively three main causes of imposing YPLL on Jahrom County in 2011 and 2015.

**Conclusion:** Cardiovascular diseases were the first and most common causes of mortality in both genders. On the other hand, non-communicable diseases were the main causes of premature death in the population of Jahrom indicating the epidemiological transition and replacement of non-communicable diseases with communicable diseases in Jahrom as the main causes of death in accordance with results of national statistics of Iran.

**Key words:** Years of potential life lost (YPLL), cause of death, life expectancy

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## Introduction

Health provision and improvement require specific policies and strategies which require precise information and indices for adoption (1). Due to resource constraints, governments need to identify the most important health needs by ongoing monitoring of health system and plan and work for reducing their burdens through effective interventions (2).

In developing countries, which constitute four-fifths of the world's population, non-communicable diseases are rapidly replacing communicable diseases, and it is anticipated that non-communicable diseases, which are currently causes of less than 50% of deaths, will account for 70% of mortality rates in 2020; hence, complex prioritization of diseases for resource allocation has challenged health policy makers (3).

On the other hand, achievement of priorities is the first step in planning health interventions, and indices should be prioritized after clear reflection of real health needs of the population (4).

Comparison of reliable, valid and comparable indices of individual and population health status is an essential stage in provision of evidence and information for health system management. Collection of personal data for calculating ratio of a specific problem or disease susceptibility is the easiest and most common way to measure population health indices. On the other hand, this method has become ineffective due to the emergence of many problems and the need to compare indices between populations over time or before and after specific interventions (5).

Years of potential life lost (YPLL) index is used to determine social and economic burdens in a population due to premature death due to various causes (3).

This index is among the indices of Summary Measures of Population Health (SMH) which includes health expectancy indices such as Disability Free Life Expectancy (DALE) indices and health interruption indices such as Disability Adjusted Life Years (DALY) indices which are very important in prioritization of health interventions (6).

Life expectancy represents average survival expectancy for all ages, and even if it shows a low expectancy for older ages, it does not reach zero and can be useful for evaluation of health and welfare level planning of population. Standard life expectancy is used to calculate years of potential life lost (4, 6).

YPLL index due to premature death by choosing a time unit as a unit of measuring and comparing years of life lost due to death with a standard life expectancy curve is a valuable analysis tool for prioritization of health problems and it can be applied in different geographical areas (2).

In study on burdens of diseases, DALY is obtained from adding number of potential years of life lost due to death and number of years elapsed due to disability and it can

reflect a gap between current and ideal health status (5). The YPLL, which is the mortality section of DALY, emphasizes the concept of early mortality and it is calculated by subtracting age at death from life expectancy of the same age in the same gender. In addition, the total life lost in a population is calculated by algebraic addition of dead people's YPLLs in that population (7, 8).

Center for Disease Control and Prevention (CDC) defines YPLL as a standard index in tables of disease for reporting. According to difference between YPLL index and mortality indexes such as Crude Death Rate (CDR), this index gives more weight to younger people's death. In addition, YPLL examines outcome of death from a social and economic point of view and reflects burden of loss resulting from life lost due to disease, while Proprietary and Crude Death Rates indicate only number of deaths in the human population, but they do not indicate burdens of these diseases; hence, it is impossible to perform regional, national, and international comparison (9).

In fact, the ultimate goal of estimating burdens of diseases through YPLL index is to provide the most objective evidence necessary to design and manage health programs, prioritize strategic research on population health, and develop and allocate human and financial resources, and expand organizational capacities for design, implementation and evaluation of cost-efficiency interventions, prevention, treatment and rehabilitation (10).

This study was conducted with the aim to determine YPLL due to premature death in Jahrom County in 2011 and 2015 and compare it with estimates in Iran and the world.

## Material and Methods

This cross-sectional study was conducted by secondary data analysis of Jahrom city in 2011 and 2015. Death certificates were compatible with the International Classification of Diseases, Tenth Revision (ICD-10) consisting of two sections, namely death certificate and burial permission. In Iran, these death certificates are completed for stillbirth (from the beginning of the 20th week of pregnancy), newborn infants, those infants who died in less than 7 days after birth, and other ages, and there is no need for completion of these certifications for abortions (before the 20th week of pregnancy).

YPLL is defined as the years when a person could have a useful life, but these years are lost due to premature death, in other words, they indicate society losses due to the loss of human capital as a result of premature death. The concept of life lost is related to concept of life expectancy. Life expectancy is a demographic index and means average time (in terms of years) when any person (with preservation of current conditions in terms of birth and death) can expect to survive at any age (4).

Excel Template software of the World Health Organization (WHO) and also standard Coale-Demeny "West" Model Life Table, levels 25 and 26, which estimates life expectancy

at birth (LE) in 82.5-year-old females (life expectancy for Japanese females) and 80-year-old males, were used to calculate the YPLL. In this table, the following equation was used to apply discount rate at discrete times:

$$n_{\text{present value}} = (1+r)^{0.5} \times \frac{1}{r} \times \left[ 1 - \left( \frac{1}{1+r} \right)^n \right]$$

Where, discount rate was considered to be 0.03 per year ( $r=0.03$ ).

$Cxe^{-Ax}$  Equation was also utilized for valuation of ages. In this equation, C is the constant value of 0.1658; x is equal to age, and  $B=0.04$  (7).

For YPLL estimation, age of death due to each cause of death was deducted from age of life expectancy for the same gender. The sum of years of potential life lost due to various causes of death was calculated based on the following formula for different age groups:

$$YPLL = \sum Di (E - I)$$

**I:** Real age at death

**Di:** Number of deaths at age I

**E:** Life expectancy for the same gender

**Ethics approval:** This project was approved by the Ethics Committee, Deputy of Research, Jahrom University of Medical Sciences (IR.jums.REC.1395.131).

## Results

In general, we analyzed data of 2,262 deaths among which 1,230 were reported in 2011 and 1,032 in 2015. Details of database are shown in Table 1. (next page)

Major causes of death were compared in terms of frequency and years of potential life lost based on general death groups of ICD10 classification in Jahrom County during 2011 and 2015 (Figure 1 and Figure 2).

These results indicate that cardiovascular diseases (35.5%), transportation accidents (6.8%) and cancer and tumors (4.6%) were respectively the three main causes of mortality in both genders in Jahrom County during 2011, while cardiovascular diseases (38.4%), cancer and tumors (11.1%) and transportation accidents (6.6%) were respectively the main causes of mortality in 2015. In addition, diseases of the respiratory system had a rise from the 8th rank of mortality in 2011 to the 4th rank; infectious and parasitic diseases from the 12th to 8th rank; unintentional events from the 4th to 12th rank; suicide from the 16th to 13th rank; and violence by others from 15th to 14th rank in 2015.

26,491 years in 2011, and 19,262.5 years in 2015 were lost due to the premature death, so that conditions originating in the perinatal period (4335.5 years), cardiovascular diseases (3675.5 years), transportation accidents (3592 years), unintentional events (2275.5 years), congenital and

chromosomal abnormalities (1607.5 years), and cancer and tumors (1132 years) were generally the first 6 causes of mortality in both genders according to the YPLL rate in 2011.

In 2015, conditions originating in the perinatal period (3,789 years), cardiovascular diseases (3,024.5 years), transportation accidents (2,716 years), congenital and chromosomal abnormalities (1,690.5 years), cancer and tumors (1,681.5 years) and respiratory system diseases (1,111.5 years) were the first 6 causes of mortality according to the YPLL rate.

Displacement of conditions originating in the perinatal period from the fifth rank of mortality in 2011 and the sixth rank of mortality in 2015 to the first rank of causes of YPLL due to premature death is the interesting point in this regard.

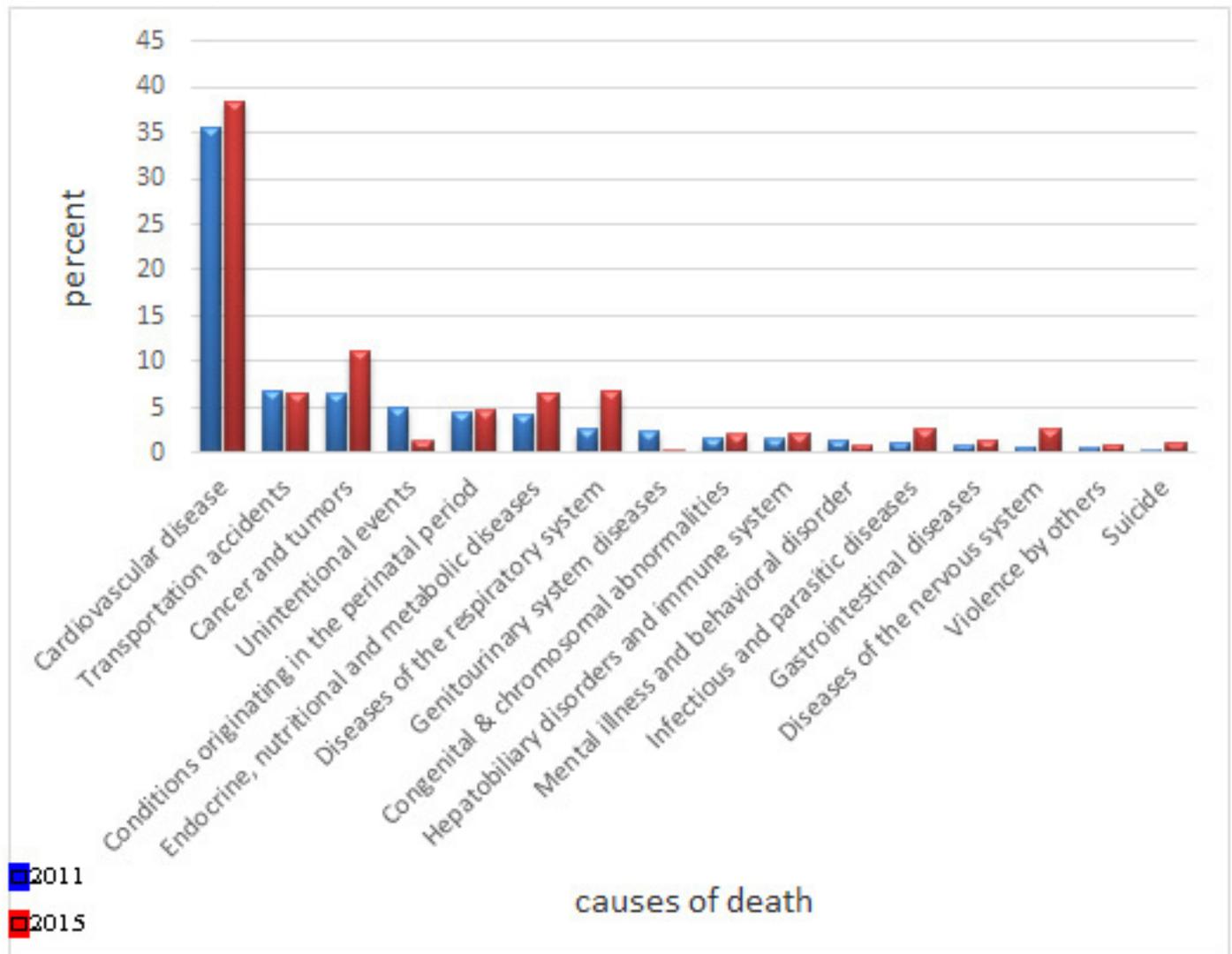
Figure 3 shows the age-specific mortality rates by gender in Jahrom County in 2011 and 2015. As shown, mortality rate was high for people under the age of 5 and then it rapidly decreased. It again increased at the age of 50 and reached its peak at 75-79 years. In 2011 and 2015, mortality rate was higher in males than females in all age groups. In 2011, the YPLL was higher in males (15,973 years) than females (10,490 years). In 2015, the YPLL was 12,255 for males and 7,370.5 for females, and also the YPLL due to premature death was higher in males than females. In 2011, the YPLL due to cancer and tumors, mental illness and behavioral disorder, congenital and chromosomal abnormalities, unintentional events, violence by others, suicide, and transportation accidents were much higher in males than females, but the YPLL was higher in females than males due to cardiovascular diseases, endocrine, nutritional and metabolic diseases, and conditions originating in the perinatal period.

In 2015, the YPLL was higher in males than females due to mental illness and behavioral disorder, cardiovascular diseases, transportation accidents, violence by others, suicide, and congenital and chromosomal abnormalities, but the YPLL was higher in females than males due to cancer and tumors, endocrine, nutritional and metabolic diseases, and unintentional events (Table 2).

Table 1: Frequency of causes of death and YPLL according to ICD10 classification according to gender

Causes of Death according to ICD10	2011						2015					
	Male			Female			Male			Female		
	Frequency	Percentage	YPLL	Frequency	Percentage	YPLL	Frequency	Percentage	YPLL	Frequency	Percentage	YPLL
Infectious and parasitic diseases	11	1.5	291	3	0.6	61.5	21	3.3	562	6	1.5	26
Cancer and tumors	48	6.4	630	31	6.5	502	69	10.8	794	46	11.6	887
Hepatobiliary disorders and immune diseases	11	1.5	138	7	1.5	184.5	16	2.5	403	6	1.5	278.5
Endocrine, nutritional and metabolic diseases	25	3.3	146	27	5.7	271	43	6.8	441	24	6.1	240.5
Mental illness and behavioral disorder	16	2.1	421	1	0.2	52.5	7	1.1	307	1	0.3	52.5
Diseases of nervous system	6	0.8	245	2	0.4	152	17	2.7	346	11	2.8	230.5
Cardiovascular disease	245	32.6	1908	192	40.3	1770.5	243	38.2	1690	153	38.6	1334.5
Diseases of respiratory system	21	2.8	307	11	2.3	219	38	6	574	32	8.1	537.5
Gastrointestinal diseases	6	0.8	6	4	0.8	53	8	1.3	265	6	1.5	68
Genitourinary system diseases	14	1.9	332	15	3.1	214	2	0.3	94	0	0	0
Congenital and chromosomal abnormalities	15	2	1200	5	1	407.5	14	2.2	1113	7	1.8	577.5
Conditions originating in the perinatal period	20	2.6	1448	34	7.1	2805	35	5.5	2800	12	3	989
Bad and vague symptoms and conditions	108	14.4	1346	64	13.4	626	58	9.1	553	44	11.1	321
Unintentional events	47	6.3	1681	14	2.9	596	6	0.9	137	7	1.8	228
Violence by others	7	0.9	327	0	0	0	4	0.6	221	45	1.3	198.5
Suicide	4	0.5	204	0	0	0	7	1.1	365	34	1	233
Unknown	79	10.5	2346	53	11.1	1925	8	1.4	43	293	0.8	0
Transportation accidents	70	9.3	2997	14	2.9	595	39	6.1	1547	29	7.3	1169
Total	753	100	15973	477	100	10490	636	100	12255	396	100	7370.5

Figure 1: Frequency of causes of death based on ICD10 classification



## Discussion

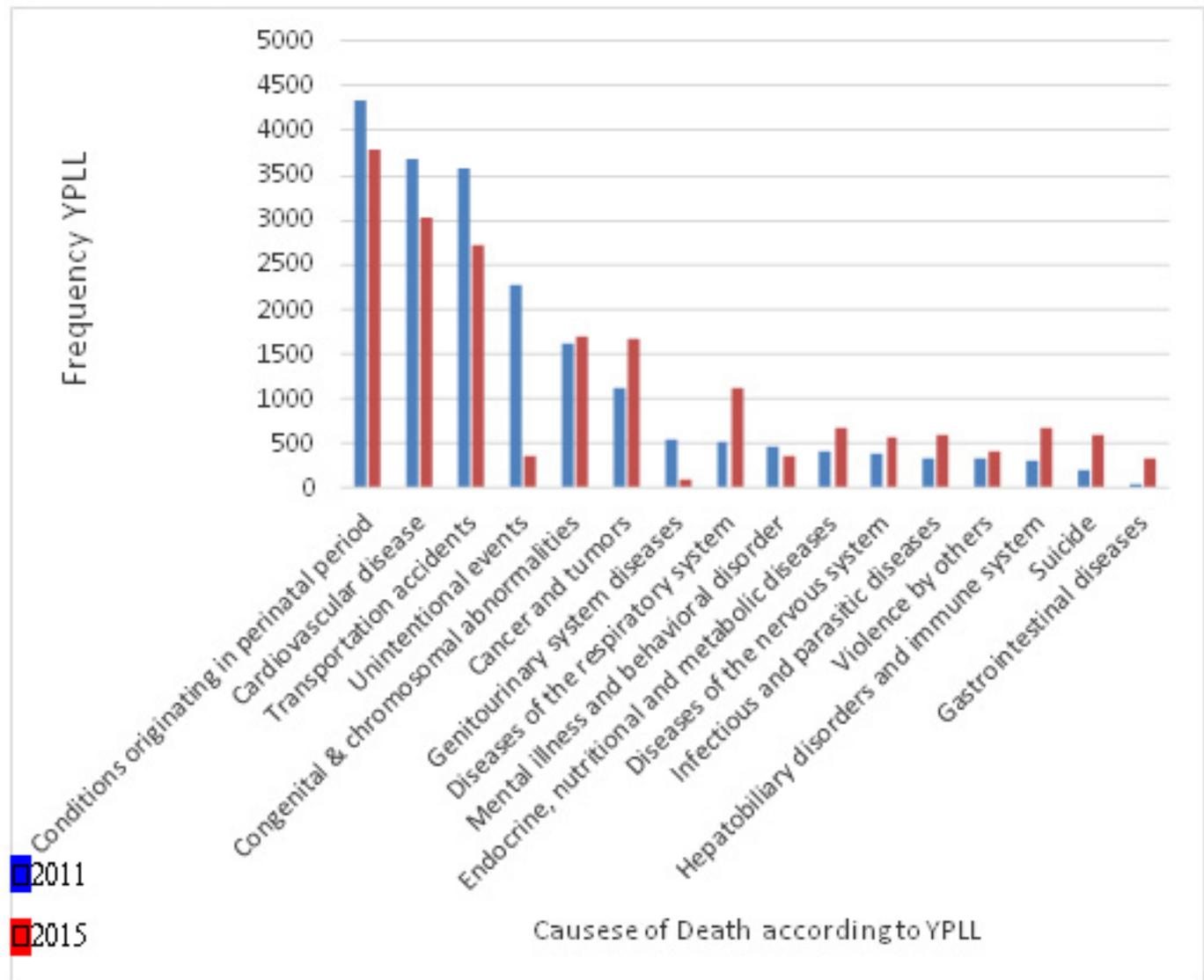
According to results of the present study, cardiovascular diseases, transportation accidents, and cancer and tumors were respectively the three main causes of mortality in Jahrom city in 2011, while cardiovascular diseases, cancer and tumors, and transportation accidents were respectively major causes of mortality in 2015, and cancer and tumors surpassed transportation accidents, so that cause of death was increased from 6.4% in 2011 to 11.1% in 2015.

Based on results of this study, conditions originating in the perinatal period, cardiovascular diseases, and transportation accidents were respectively the three main factors that imposed YPLL on Jahrom County in 2011 and 2015, and generally non-communicable diseases constituted the first five causes of premature death in Jahrom and this indicated epidemiological transition and replacement of non-communicable diseases with communicable diseases as the main causes of death. According to research by Khazaei et al. (2012) in Tuyserkan County, cardiovascular diseases, transportation accidents, and diseases of the respiratory system were respectively the main three causes of death (3).

It was found that conditions originating in the perinatal period were the first factor in YPLL in this study and occurred during infancy and childhood, as a total of 101 deaths were due to conditions originating in the perinatal period, and 8,124.5 years of potential life were lost according to this study. Displacement of conditions originating in the perinatal period from the fifth rank of mortality in 2011 and the sixth mortality rank in 2015 to the first rank of causes of death leading to years of potential life lost due to premature death is an interesting point as its significant importance in total years of potential life lost is obviously due to the young age at death.

Cardiovascular disease was the second cause of premature death in this study, so that the average age of deaths from cardiovascular diseases was  $72 \pm 13.71$  years leading to 3,678.5 years of potential life lost in Jahrom County in 2011, and 3,024.5 years of potential life lost in 2015. Cardiovascular diseases are the major causes of disability and premature deaths in addition to huge health costs worldwide (11).

According to research by Pourajal et al., who studied data of death in Hamadan province in 2010, cardiovascular diseases and transportation accidents were estimated as the two main causes of YPLL (4). In research by

**Figure 2: Frequency of YPLL based on ICD10 classification**

Farahbakhsh et al in the East Azarbaijan Province in 2010, Ischemic and myocardial infarction, unintentional events, and cerebrovascular diseases were classified as the three main causes of premature death (5).

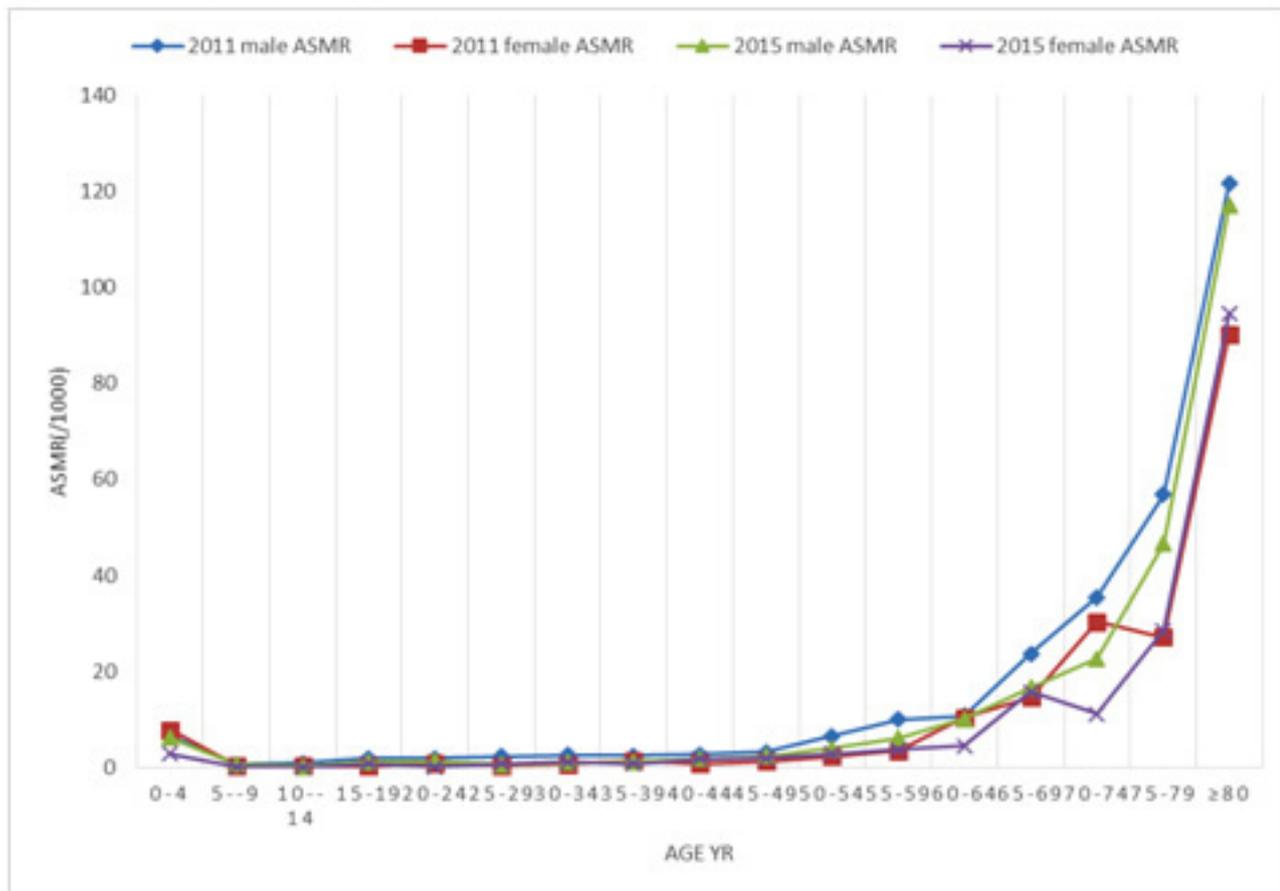
According to Maleras's research in Spain, cancer and tumors and cardiovascular diseases were respectively the two main causes of YPLL in Spain (12).

26,491 years of life in 2011, and 19,262.5 years in 2015 were lost due to premature death. In both studied years, YPLL was higher in males than females, as the main difference between females and males was related to transportation accidents. Death from transportation accidents mainly occur in males; and the present study also confirmed this case. This finding is based on the fact that burdens of premature events and consequences are higher in males who are more likely to suffer more from transportation accidents. 64.7% of males' accidents were reported in a research in Turkey (13).

In Africa and countries with low-middle income, males have the highest rates of death from transportation accidents worldwide (14).

YPLL level is higher in males than females in all age groups except for age groups of 0-4, 47-70 and 75-79 years, and this may be due to differences in lifestyles in both genders and more transportation accidents in males in addition to more high risk behavior in males such as tobacco use. According to studies by Pourajal et al in Hamadan of Iran (13) and Maleras et al in Spain (12), males had more YPLL.

Despite the fact that suicide is not the most significant problem in the world, released statistics by the World Health Organization (WHO) and health organizations of countries have raised global concern about suicide rates in young people. About one million suicides occur per year. Suicide rate is 16 people per 100,000 people in the world. Death rate due to suicide has been rising in both genders in Jahrom County, as it increased from 0.3 percent of death in 2011 to 1.1 percent in 2015. The young population of the county and the rising trend of suicide in addition to non-reporting of such deaths and failure to record unsuccessful suicide attempts increase sensitivity of this problem, so that mean age at suicide was  $29 \pm 13.85$  in this study, and it is essential to take appropriate measures in this regard.

**Figure 3: ASMR per 1,000 by year and sex**

In this study, the mortality rate was higher in males than females in all age groups, as ratio of male's death to females was 1.6 times; and 158 males against 100 females died in 2011, but they were 160 males against 100 women in 2015.

Lack of complete coverage of this system is one of the current problems in the registration system of death in Iran (15). The present study defined ratio of registered codes as "bad and vague symptoms and conditions" decreased from 14% in 2011 to 9.9% in 2015, and this decrease reflects authorities' greater concern for registering deaths in the male system because these percentages of death have other real causes which are not recorded in data and have different effects on calculated indices; and we hope there will be no further instances of these codes in the coming years.

## Conclusion

Results of this study indicated that cardiovascular diseases were the first and most common causes of mortality in both genders. On the other hand, conditions originating in the perinatal period, cardiovascular diseases, and transportation accidents were respectively three main factors that imposed YPLL on Jahrom County in 2011 and 2015, and in general, the non-communicable diseases were the main causes of premature death in the Jahrom population indicating the epidemiological transition and replacement of non-communicable diseases with communicable diseases as the main causes of death in accordance with results of national statistics in Iran.

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**Table 2. Distribution of deaths, ASMR per 1,000, and YPLL by year, gender and age group**

Age (yr)	2011						2015					
	Male			Female			Male			Female		
	Death	ASMR	YPLL	Death	ASMR	YPLL	Death	ASMR	YPLL	Death	ASMR	YPLL
0-4	54	6.61	4309	61	7.81	5100.5	60	6.17	4779	25	2.79	2058.5
5-9	5	0.66	368	3	0.41	226.5	5	0.58	370	1	0.12	75.5
10-14	6	0.80	407	2	0.27	142	1	0.12	67	0	0	0
15-19	18	1.94	1127	2	0.23	132	10	1.17	637	5	0.70	323.5
20-24	23	1.83	1328	10	0.81	600	13	1.24	752	7	0.76	421.5
25-29	31	2.31	1653	5	0.39	247.5	8	0.59	422	9	0.78	494.5
30-34	24	2.59	1153	6	0.62	308	14	1.01	684	14	1.11	705
35-39	17	2.37	728	10	1.40	457	11	1.06	470	7	0.72	312
40-44	18	2.72	680	5	0.78	204.5	13	1.73	486	12	1.70	487
45-49	18	3.15	591	7	1.21	252.5	16	2.32	525	12	1.90	423
50-54	34	6.51	930	11	2.26	336.5	22	3.90	604	15	2.75	452
55-59	40	9.95	910	14	3.47	358	31	6.18	715	17	3.63	426.5
60-64	30	10.68	543	32	10.29	665	38	10.07	675	17	4.48	350.5
65-69	37	23.62	489	27	14.62	415	45	16.67	590	25	15.69	402.5
70-74	65	35.42	517	60	30.31	625	32	22.58	264	17	11.05	177.5
75-79	86	56.80	240	35	27.17	386	70	46.60	215	42	28.55	225
≥80	246	121.72	0	157	90.28	34	247	117.06	0	171	94.57	36
Total	752	-	15973	477	-	10490	636	-	12255	396	-	7370.5

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# The family centered empowerment program can relieve stress, anxiety, and depression of heart failure patients' family caregivers

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## Abstract

**Background:** Living with heart failure (HF) patients is a complex condition for family caregivers. Few interventional studies have yet been conducted to relieve several challenges of HF patients' family caregivers in a caring situation. The aim of this study was to investigate the effects of an educative-supportive intervention in relieving stress, anxiety, and depression in HF patients' family caregivers.

**Materials and methods:** This clinical trial was conducted in a capital teaching hospital in Isfahan, Iran in 2014. The intervention consisted of two-hour multimedia-assisted educative-supportive sessions for four weeks. The participants were 50 family caregivers of HF patients. The levels of stress, anxiety, and depression were measured by short-form version of the Depression Anxiety Stress Scale 21. Paired and student's t-tests and ANOVA were used to compare the mean differences of stress, anxiety, and depression scores between the two groups throughout a three-month period.

**Findings:** The educative-supportive intervention had appropriate effects in reducing HF patients family caregivers' stress, anxiety and depression at the completion and three months after the completion of the intervention ( $P < 0.001$ ).

**Conclusions:** Nurses and other health care providers can use the results of this study to effectively implement suitable interventions for reducing challenges of family caregivers in a caring situation.

**Key words:** Stress, Anxiety, Depression, Family caregivers, Heart failure, Iran

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## Introduction

Heart failure (HF) is the final outcome of many cardiovascular diseases that is estimated to affect over 5.8 million people in the USA and over 15 million people in Europe (1, 2). Unfortunately, no reliable data have yet been reported about the number of HF patients in Iran due to poor registration. It seems that the prevalence of HF will reach 3,500 per 100,000 population in Iran in the near future (3, 4). Because HF is a debilitating and chronic disease, the families may care for these patients for a long time. Sometimes, a patient's family member, such as his/her spouse or child, takes responsibility for caring (2, 5, 6). Certain factors are associated with negative complications of caretaking. Moreover, the family caregivers of HF patients become involved in performing heavy duties of caretaking that can be associated with continuous monitoring of the disease's symptoms, management of diet and therapeutic regimen, repeated hospitalization, use of new and complex therapy equipment, and stupendous treatment costs (1, 7).

Most caregivers are faced with stress, anxiety, and depression due to overwhelming tasks in a caring situation (1, 8). Although some studies have reported that the caregivers of HF patients experience caretaking-related stress, anxiety, depression, and conflict in the literature (7, 9, 10), few studies have yet investigated interventions to reduce caretaking-related complications among these caregivers. Also most studies have been conducted on the caregivers of patients with other chronic diseases such as dialysis patients and patients with schizophrenia (11, 12).

In this literature, studies on different interventions to reduce adverse effects of caretaking among family caregivers have recommended six types of interventions consisting of psychological training, support, daily care, psychotherapy, skill development in care receiver, and multidimensional interventions. A one-dimensional program may fail to resolve the family caregivers' challenges because these caregivers have a wide spectrum of requirements. Therefore, a multidimensional intervention, i.e. a combination of different interventions, will be more fruitful (3, 8, 11, 13). Living with a family member who has a chronic disease has different dimensions. At first, family supports the patient seriously, but support declines over time and the patient and family member may be losing their hope for the future. Therefore, living with a chronic disease in the long term leads to stress, anxiety, and depression in family members. In Iran, family caregivers have received little formal training and support by governmental or nongovernmental services (11, 14). Besides that, most patients with HF refer to public hospitals to receive health care services, and therefore the health care team cannot efficiently examine and meet the caregivers' requirements because of their heavy workload and inadequate time (15, 16).

Regarding the current challenges ahead of HF patients' family caregivers, this study was conducted to investigate the effects of a group, educative-supportive interventional program on the levels of stress, anxiety, and depression in the family caregivers of patients with HF.

## Materials and methods

This randomized clinical trial was conducted in the family and patient training center, Al-Zahra hospital of Isfahan, Iran. This study compared the effects of a group, educative-supportive intervention and a routine health care protocol on the levels of stress, anxiety, and depression of HF patients' family caregivers. The number of study samples enrolled from a capital hospital was 136, and 100 caregivers with inclusion criteria were randomly divided into two groups; intervention and control (50 in each group), by using a random number table. To achieve this purpose, first, the samples were numbered 0-100 and then the first and second participants who were selected by random number table were assigned to the intervention group and the control group, respectively. This process continued until 50 people were assigned to each group. The inclusion criteria were: having a few months' experience of caring, being 18 years old and over, financially supporting the patient, and having communication skills for interview. The levels of stress, anxiety, and depression of family caregivers were measured by a standard instrument, short-form of the Depression Anxiety Stress Scale 21 (DASS-21) before the intervention, at the completion of the intervention, and three months after the intervention, in both groups. Then, the results were compared.

Demographic and clinical characteristics of the caregivers and patients such as education level, gender, age, employment status, and marital status and ejection fraction of the patients were recorded. The shortened version of DASS 21-item version has been used in several studies because its items can easily be responded to (17, 18). The items are responded to by a four-point scale (Never: 0, to some extent: 1, to a large extent: 2, and very often: 4)

Range of scores is 0-21 for each domain (anxiety, stress, and depression) and therefore 0-63 for total scale. The mean scores 0-21, 22-43, and 44-63 represent mild, moderate, and severe levels of anxiety, stress, and depression, respectively.

In this study, the interventional program was developed according to the results of a preliminary qualitative study on the experiences of family caregivers that was approved by an panel of experts and reviewed against similar studies. In this program, special purposes and contents, education and learning strategies, and audiovisual materials were designed (19, 20). This program consisted of two-hour multimedia-assisted sessions and individual counseling for four weeks. In each session, 10 family caregivers underwent the program which was conducted by a cardiologist, a psychiatric nurse, a cardiac care nurse, and a clergyman. In the introductory session, after the people were introduced to each other, the protocol of each session was explained for them and an informed consent form was completed. The research purposes were explained to all participants. Then, they provided their informed consent to participate in the study and were ensured that they could withdraw from the study at any time with no penalty. Then, the levels of depression, anxiety, and stress were

anxiety, and stress were measured using DASS-21. The Isfahan University of Medical Sciences approved the protocol of this study, and the Iranian Registry of Clinical Trials registered this study as IRCT20130212452N1 code.

In the educational sessions, the significance of caretaking from the Islamic perspective, HF signs and symptoms, HF patients' pharmacotherapy especially at home, and caretaking practices were explained to the participants. Besides that, the caregivers were trained in to how manage the signs and symptoms, time and principle care in emergency conditions. In addition, the research team trained the caregivers how to access more family and organizational support and acquire coping skills and strategies.

In the sessions, a variety of support and learning strategies were taught to the caregivers through certain techniques such as power point, educational CD, booklets, and a specific updatable weblog for caregivers.

The first half of each session was a lecture delivered by the research team and the second half was group discussion between the caregivers and the research team. Throughout these sessions, the caregivers described their experiences in the caring situation and discussed ways of learning how to cope with their own conditions. The intervention group was counseled individually and via telephone by the family and patient training center for three months after completion of the intervention.

The control group received routine health care in the hospital. After the intervention was conducted for the intervention group, the booklets, CD, and the internet address of the designed weblog for HF caregivers were delivered to the control group, so that they could also use this intervention.

Demographic and clinical characteristics of the two groups were compared using chi-square test. In-group and inter-group comparisons of the variables were done by student's t-test and paired t-test, respectively. ANOVA was used to investigate the significance of mean differences between the two groups. The data were analyzed by SPSS 17 and  $P < 0.05$  was considered to be the level of significance.

## Results

A total of 100 family caregivers were enrolled in the study. Thirteen participants (eight in the intervention group and six in the control group) did not complete the interventional program because their patients died (attrition rate: 13%). The mean age of the participants was  $40.78 \pm 9.30$  years in the intervention group and  $41.44 \pm 9.21$  in the control group with no significant difference according to independent t-test ( $P = 0.0741$ ).

Regarding kinship, 38.1% of the caregivers were the patients' daughters, 28.6% their spouses, 19% their sons, 9.6% their siblings, and 4.7% were their parents. Most (76.2%) caregivers were married and 54.8% were housewives and 26.2% had elementary education. The

mean age of the patients was  $61.09 \pm 11.8$  years and most (59.5%) of them were male. There were no statistically significant differences in mean scores of stress, anxiety, and depression and demographic characteristics of the two groups before the intervention ( $P \geq 0.05$ ).

Mean (M)  $\pm$  standard deviation (SD) score for anxiety in the intervention group was  $23.94 \pm 5.47$ ,  $15.36 \pm 3.38$ , and  $18.72 \pm 3.61$  before the intervention, at completion of the intervention, and three months later, respectively; the corresponding scores in the control group were  $22 \pm 5.46$ ,  $25.17 \pm 5.30$ , and  $27.79 \pm 11.93$ , respectively. According to independent t-test, no significant difference was seen in mean score for anxiety between the two groups ( $P = 0.085$ ). Independent t-test indicated a significant difference in mean score for anxiety between the two groups at completion of the intervention and three months later ( $P < 0.001$ ) (Table 1 - next page).

There is no statistical difference of mean score of anxiety at baseline between intervention and control group using independent t test ( $P = 0.085$ ). Also this test showed statistical differences of mean score of anxiety at post-intervention ( $P < 0.001$ ) and 3 month post-intervention ( $P < 0.001$ ) between intervention and control group.

M $\pm$ SD score for stress in the intervention group was  $29.10 \pm 4.97$ ,  $17.42 \pm 4.35$ ,  $20.88 \pm 3.65$  before the intervention, at completion of the intervention, and three months later, respectively; the corresponding scores in the control group were  $27.53 \pm 5.09$ ,  $30.05 \pm 5.20$ , and  $30.92 \pm 4.34$ , respectively. According to independent t-test, no significant difference was seen of mean score for stress between the two groups ( $P = 1.47$ ). Independent t-test indicated a significant difference in mean score for stress between the two groups at completion of the intervention and three months later ( $P < 0.001$ ) (Table 2).

There is no statistical difference of mean score of stress at baseline between intervention and control group using independent t test ( $P = 1.47$ ). Also this test showed a statistical differences= of mean score of stress at post-intervention ( $P < 0.001$ ) and 3 month post-intervention ( $P < 0.001$ ) between intervention and control group.

Mean  $\pm$  SD score for depression in the intervention group was  $27.94 \pm 5.41$ ,  $18.42 \pm 3.66$ , and  $21.27 \pm 3.41$  before the intervention, at completion of the intervention, and three months later, respectively; the corresponding scores in the control group were  $26.46 \pm 5.47$ ,  $30.51 \pm 9.27$ , and  $30.10 \pm 5.48$ , respectively. According to independent t-test, no significant difference was observed in mean score for depression between the two groups before the intervention ( $P = 0.233$ ), but a significant difference was seen between the two groups at completion of the intervention and three months later ( $P = 0.233$ ) (Table 3).

There is no statistical difference of mean score of depression at baseline between intervention and control group using independent t test ( $P = 0.233$ ). Also this test showed a statistical difference of mean score of depression at post-intervention ( $P = 0.233$ ) and 3 month post-intervention ( $P = 0.233$ ) between intervention and control group.

**Table 1: Comparisons of anxiety mean score among baseline, post-intervention and 3 months post-intervention in intervention and control groups**

The time of the study Mean score of anxiety	Baseline		Post- intervention		3 months post-intervention	
	Control	Intervention	Control	Intervention	Control	Intervention
Mean	22	23.94	25.17	15.36	27.79	18.72
SD	5.46	5.47	5.30	3.38	11.93	3.61
Test	t=1.74 P=0.085		t=-9.64 P<0.001		t=-4.37 P<0.001	

**Table 2: Comparisons of stress mean score among baseline, post-intervention and 3 months post-intervention in intervention and control groups**

The time of the study Mean score of stress	Baseline		Post- intervention		3 months post-intervention	
	Control	Intervention	Control	Intervention	Control	Intervention
Mean	27.53	29.10	30.05	17.42	30.92	20.88
SD	5.09	4.97	5.20	4.35	4.34	3.65
Test	t=1.47 P=0.144		t=-11.53 P<0.001		t=-10.76 P<0.001	

**Table 3: Comparisons of depression mean score among baseline, post-intervention and 3 months post-intervention in intervention and control groups**

The time of the study Mean score of depression	Baseline		Post- intervention		3 months post-intervention	
	Control	Intervention	Control	Intervention	Control	Intervention
Mean	26.46	27.94	30.51	18.42	30.10	21.27
SD	5.47	5.41	9.27	3.66	5.48	3.41
Test	t=1.20 P=0.233		t=-7.48 P<0.001		t=-8.28 P<0.001	

## Discussion

In this study, most caregivers reported several psychological challenges and emotional distress due to the overwhelming caregiving roles and responsibilities. The findings of this study indicated that a four-week group, educative-supportive intervention could have significant effects in relieving the caregivers' anxiety, stress, and depression. In the present study, the levels of anxiety, stress, and depression decreased significantly in the intervention group after the program. These findings suggest that this program not only resulted in a reduction in the family caregivers' several psychological challenges but also prevented an increase of these problems in the control group. In this literature Duhamel and colleagues (2007) conducted

qualitative research on the effects of a nursing intervention among the caregivers of HF patients. They found their intervention facilitated humanistic caretaking of HF patients and increased satisfaction among the family caregivers in a caregiving situation and their responsibilities (21). Etemadifar and colleagues evaluated the effectiveness of group intervention on the family caregivers' burden of HF patients. They indicated that a simple and short-term intervention could reduce the family caregivers' burden significantly (3). Most of the interventional studies were conducted on patients and family caregivers of other chronic diseases. For example, in an interventional study to investigate the short-term effects of group and individual support programs for caregivers of stroke patients, Van den Heuvel and colleagues (2000) reported that the group

program and home visit contributed significantly to increase caregivers' care-related knowledge and use of active coping strategies. They recommended implementation of more suitable interventions that focus on coping and providing information to caregivers (22). Consistent findings were reported by other interventional studies on caregivers of schizophrenia and mood disorders (11), dementia (23), and hemodialysis patients (24) in Iran.

The caregivers of patients with chronic diseases can share their experiences. Therefore, training in basic care and managing time, providing more formal and informal support, and helping them to facilitate their daily routines could reduce their stress, and enhance the quality of life among the patients and the caregivers. Family caregivers who experience high levels of stress are faced with challenges in caretaking roles and supporting their patients, which may interrupt appropriate caretaking (7, 9, 10). Because the family caregivers are vital agents for delivering appropriate care to the patients, caring for and supporting the patients would dramatically decline, particularly at home, if the caregivers suffer from chronic stress (7, 25). In this study, we observed that a group, educative-supportive intervention for the caregivers of patients with HF can effectively relieve stress among these caregivers, especially at home. Therefore, health care providers, especially nurses, can play an important task in supporting the caregivers through implementing similar programs.

This study had certain limitations. The personal perceptions of the two groups were different. Besides that, economic, personal, and family differences between the two groups were not taken into account. However, the research team controlled for these differences to some extent through randomly assigning the caregivers to the two groups. The findings of this study were confirmed after a three-month follow-up in comparison with longer follow-up in other studies. Therefore, further studies should investigate the effects of similar programs in the long term.

## Conclusion

The findings of this study confirmed the positive effects of a group, educative-supportive intervention on family caregivers of HF patients' stress, anxiety and depression. This is a simple, feasible, and applied intervention that not only relieves the caregivers' stress at home but also enhances their capabilities and self-confidence in caring for patients especially at home. Finally, it could prevent long-term and repeated hospitalization among HF patients. Further studies should be conducted to examine different components of these programs to reduce several challenges in the caring situation. Health care policymakers and professionals, especially nurses, should find ways to implement these programs and encourage the caregivers to participate in these programs in order to facilitate caretaking tasks.

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# Dimensions of developmental function of family in predicting the executive functions of deaf students

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## Abstract

**Introduction:** The current research was conducted to evaluate the dimensions of developmental family function in predicting the executive functions of deaf children.

**Method:** The research method is descriptive-correlational. For this purpose, 60 people were selected among the deaf students with mean age of 10 years and three months at Mashhad using cluster sampling method. Data collection tool was Developmental Family Function Assessment Questionnaire (DFFAQ) and Kulij Psychological Neurology Questionnaire (Alizadeh and Zahedi, 2005). To analyze the data, Pearson correlation and stepwise regression were used. Findings revealed a significant positive correlation between developmental family function and executive functions of deaf students ( $p < 0.01$ ,  $r = 0.44$ ), positive significant correlation between developmental family function and organizing ( $p < 0.05$ ,  $r = -0.31$ ) and positive significant correlation between developmental family function and decision-making-planning ( $p < 0.01$ ,  $r = 0.31$ ), and positive correlation between developmental family function and inhibition ( $p < 0.01$ ,  $r = 0.27$ ). Findings of multiple regression analysis suggest that components of developmental family function can predict executive functions components of deaf students ( $p < 0.01$ ). In total, findings of this research revealed that developmental family function (attention and regulation, intimacy, etc.) is effective in predicting executive functions of deaf students.

**Key words:** executive functions, developmental family function, organizing, decision-making-planning, inhibition

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## Introduction

A deaf person is a person who cannot communicate with members of society verbally due to hearing loss and their hearing is not effective enough to engage in a normal life and they are not able to learn the environmental language through hearing. Millions of people in the world suffer from moderate to severe hearing impairment (Heward, 2006; Baltussen and Smith, 2012).

Family is a natural organization using communicative and functional patterns over time, and these patterns form the family structure. In addition to determining the role of family members, it determines the scope of each member and facilitates the exchange of views among the members (Minuchin and Fishman, 2005). The term "executive function" refers to a wide range of conscious meta-cognitive processes, such as planning, organized searching, impulse control, targeted behavior, goal representation, using flexible strategies, selective attention, attention control, start of actions, fluency of actions and self-assessment and performance (Kiyon Coola, 2007, quoted by Obeidi Zadeghan, 2007; Rhine-Kahlback, 2003). Executive functions include several psychological functions such as decision-making, planning, inhibition, planning for action and movement outputs. In fact, executive functions undertake the planning of actions, and the development of new movement outputs in response to adaptive external situations (Reynolds and Kamphaus, 2004; Hughes, 2002). Executive functions refer to a set of cognitive capabilities, including self-regulation, inhibition, strategic planning, cognitive flexibility, time perception, impulse control, and working memory which assist people in performing learning tasks, intelligence actions, and educational issues. Neuro-cognitive executive functions are important structures, playing a vital role in directing and controlling behavior (Alizadeh, 2006). The presence of a person with hearing impairment causes many unique and different challenges for a family (Van Eldik, Treffers, Veerman & Verhulst, 2004; Slaby and Gaura, 2003). Hearing sequence, which is one of the hearing memory functions, was determined by Conway, Pison and Kronberg in 2009. Results revealed there are several methods to determine the sequence delay. Visual sequence and touching sequence in deaf children were determined to investigate the relationship between visual sequence and touching sequence and hearing sequence. Findings revealed that deaf children have delay in all three areas (Rhine-Kahlback, 2004). In the auditory teaching model, the child gains the ability of learning new information through listening alone. This process is required to achieve hearing learning, which involves four different levels of development of hearing. Recognition is the most basic hearing skill. This awareness relates to presence or absence of sound. The recognition occurs when the initial auditory cortex records that the sound is present. Studies have indicated that deaf children have impairment in the executive functions (Soltani and Sharif Daramadi, 2005), and this impairment is more because of secondary factors such as family, school, and environmental factors (Horn, 2004). There is correlation between damage to language and defect in executive functions (Ober, 2007). Family,

social, and economic factors are involved in executive functions and cognitive capability of the deaf children. Mothers speaking more with their children can develop and improve their executive functions (Kaufman and Kaufman, 2004). Studies have indicated that the growth of executive functions depends on social experiences (Hao, Sue, Chan, 2010). When the parental interactions are high in a deaf child, as the relaxation is high in these communications, the language growth will be greater. The family is composed of people, in which the characteristics of the family members affect each other. Families play a role against the diseases based on systematic patterns (Salami, 2010). Developmental, individual differences, and relationship-based approach (DIR), as a modern and an integrated approach, tries to depict the healthy and optimal path for human development. In this approach, developmental disorders of children, as a set of symptoms needing to be treated individually, are not considered, and the child development and its associated pathology in the context of the interactions of biological, psychosocial, and social factors are not investigated (Greenspan, Wieder, 2006). Each child is born with a unique nervous system, manifesting itself in functions of senses, movements, and sensory, cognitive, and emotional processes. On the other hand, the child's family, affected by culture and certain characteristics of the community, communicates with the child. The quality of child interactions with parents, is affected by child unique characteristics and parent educational style, and determines types of developmental outcomes, such as behavioral characteristics and cognitive, social, and emotional skills of child (Greenspan, Wieder, 2006). In this developmental model, it is stated that all capabilities of humans, such as self-awareness, empathy, problem-solving, and social and emotional skills are produced by acquiring the basic capabilities of humans, such as regulation ability, being attracted by people, social communication, and thinking, and constructed within the social interactions of the child with others, especially parents (Amin Yadi, 2012). Accordingly, Ali et al (2015) conceptualized the functional healthy family functions that create a healthy development path under the title of developmental family function, and they stated that the family system, as a unique unit, should achieve the basic emotional-functional capabilities, which are essential for the healthy psychological development of the family members. These emotional-functional capabilities include attention and regulation. This capability represents the relaxed, comfortable, and regulated family conditions. In the family, in which this capability has been achieved, members know each other's individual characteristics and they consider each other's characteristics, needs, desires, and challenges in communicating with each other, and regulating the family environment. For example, when a child needs high mobility and dynamics, members provide the environment in a way that in which there can be healthy, regulated, and relaxed mobility, rather than limiting and controlling him or her (Greenspan, 2007).

### Symptoms of executive malfunctions (quoted by Halaygan, Kishka and Marshall, 2004)

Cognitive symptoms include short attention span, weak working memory and weak short-term memory, planning and reasoning forms, lack of flexibility in the emerging situations, environmental dependence syndrome, and disorder in selective attention. Behavioral symptoms also include perseveration behavior, undue aggression, emotional symptoms, defect in inhibition of emotions, anger, arousal, sadness, etc.

## Research Tool

### Developmental Family Functional Assessment Questionnaire (DFFAQ):

Developmental Family Functional Assessment Questionnaire was developed by Ali et al. (2013) according to theoretical basis of the developmental, individual differences, and relationship-based approach (DIR). This questionnaire includes 43 items and 7 subscales, including attention and regulation, being attracted in human relationships, targeted exchange, shared social problem solving, developing the representations and ideas, logical thinking, and discipline. The criterion validity of this questionnaire was reported to be 0.75, 0.93, and 0.92 using McMaster Family Assessment, test-retest coefficient, and Cronbach's alpha, respectively. Each component score is calculated through aggregating the score of the items related to that component divided by the number of the items and the answer to the questions is performed based on the Likert scale ranging from never (0) to always (3) and the score is between 0 and 3. The psychometric characteristics of this tool were examined on 148 mothers of 4-6 years old children at Mashhad kindergartens. They were selected from different Mashhad Municipality districts using multistage cluster sampling. Based on Cronbach's alpha, the internal consistency was obtained at 0.74 for the subscale of attention and regulation, 0.71 for being attracted in human relations, 0.75 for mutual relationship, 0.66 for shared social problem-solving, 0.69 for developing the representations and ideas, 0.58 for logical thinking, 0.53 for discipline, and 0.92 for the whole questionnaire. In a group of 30 people with one month interval, re-test coefficient for the sub-scales was estimated to be 0.53 to 0.84 and it was estimated to be 0.93 for the total questionnaire. The criterion validity of this questionnaire was examined by McMaster Family Function Measurement

Questionnaire and the correlation coefficient was obtained as -0.75. In total, it shows that developmental family function measurement questionnaire has a good validity and reliability to determine the development level of family transformation. A high score in each subscale indicates the family achievement to that level of development and a low score suggests poor function at that level (Ali et al., 2013). Kulij neuropsychology and personality questionnaire: executive functions are assessed according to Coolidge neuropsychology and personality questionnaire version 2000. This test recognizes several neuropsychology and personality disorders in children and adolescents aged 5 to 17 years and it has been developed to assess the child's behavior during one week. As child behavioral problems are scored in this test, high scores in its subscales suggest more problems in the same area. Each disorder has a certain and distinct subset. Two cases of these sub-scales assess the executive functions with 19 items. Parent;s respond in a Likert scale. These two subscales assess the executive functions of three areas of organizing, decision-making-planning, and inhibition. The reliability was obtained as 85% for the organizing and decision-making-planning, and 66% for inhibition subscale. Cronbach's alpha was also obtained at 90% (Alizadeh and Zahedi, 2004).

## Procedure

A questionnaire was used in this research given the nature of research which is quantitative and survey. The research procedure was so that based on the research objectives and the method of completing the questionnaires, developmental family function and the executive function scale were provided for mothers. After collecting the data, they were analyzed using SPSS software.

### Data analysis method

Data of this research were analyzed using correlation analysis and regression analysis. Accordingly, descriptive statistics of mean and SD were calculated to describe the research variables. Then, correlation analysis and multiple regression analysis were used to examine the relationship between the family transformation function and the executive functions of the deaf students.

### Findings

Descriptive findings of mean and SD and findings of correlation between research variables are as follows.

### Table 1: Descriptive findings and findings of the correlation between dimensions of developmental family function and executive functions of deaf students

[Table 1 goes here](#)

\*\*significance at the level of 0.01

\*significance at the level of 0.05

As shown in Table 1, the lowest score of developmental family function is seen in the working memory components. Data obtained from correlation between the dimensions of developmental family function and executive functions of the deaf students suggest a positive and significant correlation between executive functions of deaf students and all dimensions of the developmental family function ( $p < 0.01$ ). The highest correlation was found between executive functions of deaf students and dimensions of inhibition and planning.

**Table 2: Regression variance analysis of the dimensions of developmental family function to predict executive functions (attention, working memory) of deaf students**

Source of variations	Sum of squares	df	Mean squares	F	Sig
Regression	734.06	1	734.66	7.87	0.002
residual	429.18	59	74.48		
Total	961.23	60			

In addition, findings of multiple regression analysis by stepwise method revealed that the executive functions of deaf students based on the attention and work memory dimensions are predictable ( $p < 0.01$ ,  $F = 7.87$ ). The value of multiple correlation coefficient ( $R^2 = 0.87$ ) suggests that 12% of the variations in executive functions of deaf students through inhibition components and decision-making-planning can be explained.

**Table 3: Regression variance analysis of dimensions of developmental family function to predict the problems of inhibition and decision-making-planning of deaf students**

Source of variations	Sum of squares	df	Mean squares	F	Sig
Regression	95.40	2	45.13	4.13	0.007
residual	76.12	59	10.15		
Total	90.12	60			

Tables 2 and 3 show the regression analysis. Multiple regression analysis findings using stepwise method show that purposeful exchange component can predict the problems of inhibition and decision-making-planning of deaf students ( $p < 0.01$ ,  $F = 4.12$ ). The value of square multiple correlations was obtained  $R^2 = 0.91$ , which is explained through the components of inhibition, planning -decision-making.

## Discussion and Conclusion

The findings suggest that assessing the developmental family function and nature in all dimensions predicts the mental health of a child. In comparing the developmental family function and the nature of the children, we concluded that developmental family function can better predict the depression of children compared to nature (Rahimi Borji, 2015). From the Powers point of view, high levels of anxiety might also result in excessive support parenting and this might limit the development of independent skills in children (Tunile and Power, 2002). However, no significant difference was found between the two groups in the dimensions of attention and regulation, bilateral interaction, development of representations and ideas. This finding suggests that almost all families are faced with the same level of this problem. Diagnosing the deafness in the child has numerous outcomes for the family (Conway and Christiansen, 2009). A person with hearing problem provides unique challenges for the family, which might affect interpersonal relationships (Patterson, Pisvand, and Myomoto, 2010). The birth of deaf children causes special psychosocial problems and emotions for parents, especially mothers in all aspects, and mothers often spend much time raising their children (Movallali,

Abdollahzadeh, Nemati, 2013). The complexity of the deafness problems and its untreatable nature and the associated communicative problems impairs the family daily life. The parents of deaf children often experience high anxiety and stress even after years of hearing loss (Pipp-Siegel S, Sedey, Yoshinga-Itano, 2002). Logical thinking of the capability refers to the ability to assess the thoughts and ideas and feelings based on logic and reality. In the families, where logical thinking governs, members can act logically and realistically in coping with different issues; they can plan and negotiate logically when facing challenges, and create a logical relationship between thoughts and feelings (Ali, Aminizadeh, Abdekhodai, Ghanaei and Mohareri, 2014). One of the major problems of deaf children is impaired executive functions (Garmabi et al., 2013; Hasanzadeh et al., 2007; Mayberry, 2002; Figueras et al., 2008). One of the intervening approaches is investigating the developmental dimensions of family. The cognitive functions area of deaf children is directly correlated with developmental family model (J.holzinger, Elinger, 2011).

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# Epidemiologic Study of Colposcopy in Clinical Centers of Kermanshah, Iran, during 2006 to 2011

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## Abstract

**Background and aim:** Cervical cancer is one of the most important cancers among women. Early diagnosis and timely treatment at the early stages of the cancer are very effective in prognosis of disease and survival of patients. The present study aimed to investigate the epidemiological characteristics of colposcopy in clinical centers of Kermanshah during 2005 to 2011.

**Methods:** In this descriptive study, 480 patients were examined. Required information from patients was collected from the records of patients referring to Motazedi Hospital, Imam Reza Hospital and the special clinic of Kermanshah University of Medical Sciences during 2006 to 2011. Data were analyzed by SPSS-16 software.

**Results:** The mean age of patients was 37.63 years. Among the examined Pap smear tests, 180 were ASCUCs, 47 LSILs, 5 HSILs, 6 AGUSs, 67 showed normal pap smears and 192 had inflammatory lesions. Patients who had ASCUS lesions in their Pap smears were known to have chronic cervicitis (36.2%) and LSIL (12%) in colposcopy. Patients with LSIL in their Pap Smears showed chronic cervicitis (48.9%) and, then, LSIL (25.5%) in their colposcopy. People with HSIL shown in their Pap smear tests mostly suffered from HSIL (60%) in their colposcopies. People with AGUS lesions mostly showed chronic cervicitis (66.7%).

**Conclusion:** According to the results of this study, it can be concluded that performing colposcopy, as a screening method for the early diagnosis of pre-malignant cervical lesions, along with Pap smear, can play a very effective role even in cases where Pap smear is normal, but the appearance of the cervix is abnormal.

**Key words:** Cervical cancer, Colposcopy, Pap smear

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## Introduction

Cervical cancer is one of the most important cancers among women and one of the main causes of cancer deaths among women (1), which is known as the sixth most common cancer in the United States (2). However, this cancer can be prevented and screening programs can reduce the mortality rate (3). In fact, early diagnosis and timely treatment of cancer in its early stages are very effective in prognosis of disease and survival of patients (2).

Risk factors such as race, sexual and reproductive factors, smoking, and the use of contraceptive methods and immune suppression can be listed as the risk factors that affect this cancer (1). Due to the position and response of the female genital apparatus too many factors, such as hormone levels and many infections, and many of the disorders and symptoms associated with the organ, such as benign and malignant neoplasms, may occur (4).

Screening and examination of women for cervical lesions is usually done by performing a Pap smear test (5). Pap smear is probably the most comprehensive and most effective screening test known (6). However, research has recommended that all individuals with a Pap smear sample be subjected to further investigations (2). Therefore, colposcopy is performed in cases of cervical dysplasia in the Pap smear or diagnosis of an unusual lesion in the normal examinations, as well as in cases of resistance to inflammation and lesions treatments (5). Colposcopy is one of the methods used globally for the early diagnosis of cervical neoplasia (7). Therefore, considering the prevalence of colposcopy in Iran and the city of Kermanshah, it is important to carry out research and accomplish relative statistical studies.

Hence, due to the importance of cervical cancer and its prevalence in women and considering prevention of this cancer and the need for further information on its epidemiology in Iran, this study aimed to investigate the epidemiological characteristics of colposcopy in clinics in city of Kermanshah, Iranduring 2006-2011.

## Methodology

In this descriptive study, all women who referred to clinics in Kermanshah (including: Motazadi Hospital, Imam Reza Hospital and special clinic of the university) during the years 2006 to 2011 were considered as samples of the study. Sample size was calculated with 95% confidence, accuracy of 0.04 and the prevalence of 21% (2), equal to 480, who were selected by available sampling method.

The inclusion criteria to the study included ages 15 to 52 years, and no history of genitalia cancers or other organs of cancer. Therefore, people with a history of cancer and in a different age range were excluded.

The data was collected using a survey including 30 options, approved by qualified individuals (gynecologists and statisticians). Age, place of residence, parity, age of first marriage, first pregnancy age, contraceptive method and duration of use, history of cryotherapy, history of smoking or drug abuse, history of genital warts, type of lesion and result of Pap smear test, type of lesion known in colposcopy and leukoplakia were the variables investigated in this study, which were extracted from the information contained in the patient records.

Data were analyzed using SPSS-16 software. For data analysis, numerical indices such as mean and standard deviation and statistical tests were used.

The Kolmogorov-Smirnov test was used to test the data. Chi-square test was used to test the qualitative data and Mann-Whitney test was used in non-normal cases.

## Findings

In this study, 480 samples were investigated; 443 (92.3%) were residents of the city and 37 (7.7%) were living in a village. The mean age of women was 37.63 years and the mean age of marriage was 18.81 years. The average age of their first pregnancy was 20.65 years, mostly aging 18 to 20 years old. 4 women (0.8%) reported a history of smoking, and 29 (6%) had a history of genital warts. 280 people were asked about the history of cryotherapy and 151 (53.9%) reported positive. 449 (93.5%) women had undergone a Pap smear.

There was no significant relationship between the age of patients with acute, semi acute and chronic cervicitis, LSIL, HSIL and abnormal cervical arteries ( $p > 0.05$ ), however a meaningful relationship was found with ectropion and lactobacilli ( $p < 0.05$ ), so that the higher age of the subjects, the less the ectropion and leukoplakia. The age of the first pregnancy and the age of marriage were also significantly associated with acute cervicitis ( $p < 0.05$ ), and no significant relationship was observed with other cases ( $p > 0.05$ ). Accordingly, the highest incidence of acute cervicitis was most common in the age group with the first pregnancy at ages younger than 25 years and the marriage age of 18-23 years old.

There was a significant correlation between parity and type of lesion in colposcopy ( $p < 0.05$ ); in subjects with parity, most samples were suffering from ectopic lesion, and in those without parity, more chronic cervicitis was observed.

There was no significant relationship between smoking, having genital warts, location and duration of use of contraceptive method and type of lesion in colposcopy ( $p > 0.05$ ).

Concerning the relationship between the type of contraceptive and the type of lesion in colposcopy, the results suggested that people who used OCP showed less semi acute cervicitis and more chronic cervicitis

**Table 1 .Frequency distribution and percentage of contraceptive type and its relation with type of lesion in colposcopy**

Contraceptive type	Frequency	Type of lesion in colposcopy							
		Acute cervicitis p.value	Semi-acute cervicitis p.value	Chronic cervicitis p.value	LSIL p.value	HSIL p.value	Ectopic p.value	abnormal vascular p.value	leukoplakia p.value
OCP	160	0.525	0.001	<0.001	0.109	0.604	0.889	1.000	0.529
TL	107	1.000	0.047	0.180	0.077	0.890	0.225	0.339	0.545
IUD	30	0.271	0.124	0.196	0.963	0.604	0.232	0.171	0.254
Condom	47	0.381	0.157	0.984	0.927	0.508	0.254	0.205	0.709
Vasectomy	10	0.533	0.933	0.678	0.977	0.769	0.582	0.235	0.098
Natural	125	0.045	0.582	<0.001	0.005	0.960	0.051	0.218	0.718

( $P < 0.001$ ) and acute cervicitis rates were higher among TL users ( $P = 0.047$ ). Also, in normal people, acute cervicitis and LSIL were higher ( $P < 0.05$ ), and chronic cervicitis was higher among patients who did not take this method ( $P < 0.001$ ). Other correlations were not significant ( $P > 0.05$ ) (Table 1).

According to the results of this study, the highest frequency of lesion in Pap smear was related to inflammation and ASCUS, respectively. Also, the highest frequency of lesion in the biopsy was related to chronic cervicitis and in the colposcopic view of ectropion (Table 2).

**Table 2: Frequency distribution and type of lesion in Pap smear, biopsy and colposcopy**

		Number
Type of lesion in Pap smear	Normal	67
	ASCUS	180
	LSIL	47
	HSIL	5
	AGUS	6
	Inflammation	192
Type of lesion in biopsy	Acute cervicitis	83
	Semi-cervicitis	44
	Chronic cervicitis	163
	LSIL	49
	HSIL	4
Type of lesion in the colposcopy view	Cervical eccentricity	67
	Abnormal Cervical Arteries	58
	Leukoplakia	26

Other results showed that there was a significant correlation between type of lesion in Pap smear and type of lesion in colposcopy ( $p < 0.001$ ). Based on this finding, in patients with normal Pap smear, the type of lesions observed in colposcopy were greater; the ectropion followed by chronic cervicitis. In patients recognized to have ASCUS lesions in their Pap smear, the type of lesions observed in colposcopy were greater; chronic cervicitis (36.2%) and, then, LSIL (12%). The number of ectropion lesions is lower in their colposcopy examination. Ectopic lesions in normal Pap smears were mostly abnormal.

The type of lesions seen in colposcopy was frequently chronic cervicitis (48.9%), and then LSIL (25.5%) among patients with LSIL in their Pap smear. In patients diagnosed with HSIL lesions in their Pap smears HSIL (60%) was greater in their colposcopies. Those diagnosed with AGUS lesions in their pap smears, chronic cervicitis (66.7%), was more frequent in their colposcopies. Also, the number of ectropion in severe inflammatory lesions was more than mild and moderate inflammatory lesions.

## Discussion

In this study, the aim of the present study was to investigate the epidemiological characteristics of colposcopy in clinical centers of Kermanshah in 2005 to 2011. A total of 480 women who participated in colposcopy in Kermanshah clinics were evaluated.

In this study, no significant relationship was found between age of first pregnancy and parity and type of lesion in colposcopy, which confirmed the results from Castle and colleagues (2005) (8). But contrary to the results of our study, Louie et al. (2009) reported that lower ages of first intercourse and pregnancy among women increased the risk of cancer (9).

In our study, 92% of the subjects were residents of the city and 8% were villagers. The results of the study indicated that there was no relationship between location and type of lesion in colposcopy. However, Hagighi et al. (2008) suggested the prevalence of malignant neoplasms and pre-neoplastic lesions were twice and triple among rural women, where 21% of the women were rural residents and 79% were urban residents, (10). One of the possible reasons for the discrepancy between the results of these two studies might be the low number of villagers in the present study.

Although it was reported that smoking women with cervical epithelium had fewer Langerhans cells than non-smokers, and the local immunity of cells in these women decreased and, therefore, they were more susceptible to viral lesions that can be the cause of cancer, in the present study, there was no correlation found between cigarette smoking and type of lesion in colposcopy, which was not consistent with the results of Bahiraeian et al. (2001) (11). One reason for the difference in results could be the small number of smokers in our study (%0.8), while the number of smokers was 20% in Bahrain et al's (2001) study (11). Also, Cuzick et al. (1996) showed no relationship between cigarette smoking and cervical cancer (12), which confirms the results from the present study.

Considering the results from this study, 43% of women were recognized with inflammation in their Pap smears, of which 8.9% showed LSIL biopsy. Based on similar results in a study in India, Bhutia et al. (2011) also found that 24.3% (102 patients) of all subjects had inflammation and 8.6% (36 patients) had persistent inflammation in Pap smear, of whom 30 had colposcopy, 16 showed abnormal colposcopy, and 5 had CIN in their biopsy (13). According to the results of these two studies, due to the low sensitivity of Pap smear the pro-malignant lesions of the cervix might not be diagnosed in women with inflammatory Pap smear. Nevertheless, scientifically it is not suggested to perform colposcopy in all women with Pap smear inflammation. Therefore, it is recommended that women with inflammatory Pap smear undergo a standard treatment period and repeat their Pap smear again, and if the inflammation persists, colposcopy should be performed.

In the present study, the incidence of LSIL and HSIL in women with ASCUS was 12.3% and 9%, respectively. In the study of Panyanupap et al. (2011) on patients with ASCUS, the prevalence of CIL and CIN was 8.6% and 3.2%, respectively (14). According to these results, colposcopy is recommended for women with ASCUS.

The present study had some limitations including lack of proper record of patients and lack of follow up systems for patients; therefore, it is suggested that future population based studies should be undertaken to determine the exact state of the disease.

According to the results of this study, it could be concluded that performing colposcopy, as a screening method for the early diagnosis of premalignant cervical lesions, along with Pap smear can be very helpful and effective even if Pap smear is normal, but the appearance of the cervix is abnormal.

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# The Effectiveness of Group Hope Therapy Training on Psychological Well-Being and Resilience in Divorced Women

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## Abstract

**Introduction:** Divorce is a factor in the breakdown of the most fundamental part of society, the family and one of the most important losses of the family. The purpose of this study was to investigate the effectiveness of group training based on the hope therapy approach on psychological well-being and resilience in divorced women.

**Methods:** The present study was semi-experimental with pre-test-post-test design and control group. The statistical population of the study consisted of all divorced women covered by the welfare center of Gilan Gharb Town in 2015. 30 people were selected by available method. They were randomly assigned to two experiment and control groups after completing the psychological well-being and resilience questionnaires and the required grade for entering the research. The tools used in this study were psychological well-being (Reef, 1980) and the resilience (Connor-Widowson, 2003) questionnaires. The experimental group received 8 hope therapy sessions. Multivariate covariance analysis was used to analyze the data.

**Findings:** Data analysis showed that hope therapy was effective in increasing psychological well-being and resilience in divorced women ( $p < 0.001$ ).

**Conclusion:** Educational intervention based on the approach of hope therapy can be used as an effective intervention in increasing the psychological well-being and the resilience in divorced women.

**Key words:** Group hope therapy, Psychological Well-Being, Resilience, Divorced Women

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## Introduction

Considering that close relationships and marriages are the source of happiness and satisfaction for most people, the breakdown of this relationship can be one of the most stressful events in life (1). Divorce is a factor in the breakdown of the most fundamental part of society, the family, and one of the major losses of family life (2). Divorce is a stressful phenomenon and increases the vulnerability of individuals, especially women, to physical and mental illness (3). Society and the family, on one hand, and the economic needs, on the other hand, intensify these problems (4). Many studies, have highlighted some negative consequences of divorce in divorced women, such as mental stress, mental health, depression and psychological burnout (5, 6). Divorce can also be seen as a multi-dimensional phenomenon that is associated with numerous issues in the field of health and well-being of people in the community (7).

One of the important issues in divorced women is the absolute status of psychological health or, in other words, their psychological well-being. Psychological well-being is one of the important concepts in the field of quality of life and the positive psychology approach. Psychological well-being refers to a sense of health that includes full awareness of integrity in all aspects of the individual (8). According to Ryff (1995), welfare is multidimensional and includes aspects such as self-esteem, individual growth, the purpose of life, positive relationships with others, environmental domination (the ability to effectively manage a person's life and their surrounding world) and the sense of autonomy (9, 10). He regards psychological well-being as a quest for perfection in order to realize a person's potentials. In this perspective, well-being means the attempt to transcend and promote that manifests in the realization of an individual's talents and abilities (11). Researchers have shown that individuals who report high levels of well-being, consider themselves to be intergenerational sources of transferring the important social skills (12). Also, people with a higher psychological well-being have the ability of compliance with problems more than those who do not have this advantage (13, 14).

Another issue of psychology that has attracted the attention of researchers in the field of positive psychology in recent decades is resilience which refers to a human's ability to adapt to diseases, and the pain and suffering caused by stresses and stressful factors in the life (15, 16). In fact, resilience is referred to as the dynamic process of positive conformation with bitter and unpleasant experiences (17). A resilient person can innovatively and flexible think about solving the problem. Resilient people show degrees of health and independence, they can convey their opinions to others and believe in their ability to change their environment (18). They are more likely to show positive emotions in the face of emotional events (19). One of the newest therapies in the field of psychology is positive hope therapy. Hope therapy, according to Omid Snyder's theory and the ideas derived from cognitive-behavioral therapy is solution-based therapy and narrative therapy (20). It

helps people to pursue their goals and identify the paths to achieve goals and barriers and tackle barriers to achieve the goal. In fact, hope is the key to find a solution to the problems in difficult life situations (21).

The research done by Ong, Edwards & Bergemen (2006), Snyder & Tsukasa (2005) confirms the relationship between hope and psychological well-being. The research done by Lotfi Kashani, Vaziri and Zain al-Abedini (2013) has shown the efficacy of group hope therapy for reducing psychological distress in women with breast cancer. Bailey & Snayder (2007) stated that the level of hope is related to psychological well-being and happiness (22-25). The results of Khosroshahi and Hashemi Nosrat-Abad (2011) research also showed that there is a positive and significant relationship between hope and resilience with psychological well-being. The predictor variables can predict the changes in students' psychological well-being. Based on these data, those with high expectations and resilience, have a high psychological well-being (13). Barg, Snaider and Holtman (2008) in their research showed that hopeful intervention including skills training with the goal of increasing the coping with pain and raising the threshold of pain, has led to an increase in hope among women and increased pain tolerance among all participants (26). According to the research done, divorced women have more vulnerability compared to divorced men (27). Given that the problem of women's psychological health will endanger a large part of the mental health of a person, family and society, therefore there is a need for extensive research in order to find solutions for this problem. Also, this study aims to examine the effect of hope therapy on psychological well-being and the resilience of divorced women due to the increasing divorce rate and its associated problems, especially for divorced women.

## Methodology

The present study was semi-experimental with pre-test-post-test design and control group. The statistical population in this study was all divorced women who are covered by the welfare center of Gilan Gharb in 2015. They volunteered to participate in the study after the researchers called for a therapeutic course to enhance their psychological ability. In the first stage, 45 divorced women declared their readiness to study; 30 were selected in a sampling method with these conditions: getting lower scores in tests of psychological well-being and resilience, having criteria including no acute psychological disorders after one year of divorce, satisfaction to participate in research, lack of psychological counseling out of treatment sessions. They were randomly assigned to experiment and control groups. It was explained to the participants that the Hope Therapy Program was proposed for increasing their psychological well-being and resilience as well as for doing a research. In this way, the subject of informed and written satisfaction was raised and all participants entered the study with complete satisfaction.

In the present study, after determining the sample, a psychological well-being questionnaire and resilience questionnaire were provided to divorced women as a

pre-test. In the next stage, the experimental group participated in 8 sessions of 90 minutes in the Hope Therapy program, while the control group received no intervention. After completion of training sessions, post-test

was performed for the two groups. The therapy program was designed and implemented based on Snyder's research and packages (2000). The therapy program of the sessions was as follows:

**Table 1: Summaries of group session of hope therapy**

Sessions	Objectives of each session
First Session	The structure of the sessions including the introduction of members, the expression of the rules of the group and the introduction of the objectives of the curriculum based on hope theory
Second Session	Explain how to increase hope and its necessity
Third Session	Define the story of each participant's lifestyle by themselves
Forth Session	The explanation of each story based on the two main components of hope theory and re-formatting of stories
Fifth Session	Introducing a list of current events and important aspects of life with the aim of encouraging participants' hope
Sixth Session	Encouraging individuals to select the right goals and designing the appropriate goals with the aim of encouraging participants' hope
Seventh Session	The introduction of proper paths characteristics and requesting members to select appropriate strategies to achieve their goals
Eighth Session	The introduction of strategies for creating and maintaining an agent, including asking members to address self-positive thoughts and mental imagery to achieve their goals, as well as the use of hopeful thinking every day

## Research Tools

Psychology of the questionnaire: a short form of Refahi's psychology scale, which he designed in 1980, was used for the measurement of the cognitive risk of well-being. This questionnaire was prepared to evaluate six aspects of psychological well-being. The original form has 120 questions, but in later reviews, shorter forms with 84.54.18 questions have also been suggested. The short form of Reef Psychological Well-being Questionnaire has 18 questions and consists of six aspects (each aspect has three questions). The correlation of the short form of Reef psychological well-being questionnaire with the main scale ranged from 0.7 to 0.89 (9). In the research done by Khanjani et al (2014), Cronbach's alpha method was used to calculate the reliability, with a coefficient of reliability equal to 0.73 and for factors 0.67, 0.72, 0.65, 0.75, respectively. In this questionnaire, the answer to each of 18 questions is determined on a six-level spectrum (from totally opposite to fully agree). People in this questionnaire attain a score from 18 to 108(28).

Resilience Scale: This scale has been developed by Connor and Davidson (2003)(29). This scale has 25 items that are scored on a Likert scale from zero (completely false) to four (always true). The minimum score of the subject's resilience on this scale is zero and the maximum score is 100. This scale has been standardized in Iran by Mohammadi (2005)(30). He performed this scale on 248 people and achieved 89% reliability using the internal consistency of Cronbach's alpha. The reliability and

resilience of the Persian version of the Resilience Scale have been reviewed and approved in the preliminary studies of normal and patient samples (31). In the research done by Samani, Jokar and Sahragard (2007), Cronbach's alpha coefficient was 0.87 for the reliability of this test(32). The data were analyzed using descriptive statistics (such as mean and standard deviation) and analyzed by multivariate covariance analysis and using SPSS application version 19.

## Findings

Multivariate analysis of covariance was used to analyze the data and to control the effect of pre-test and post-test. One of the hypotheses of multivariate covariance analysis is to examine the homogeneity of the regression line slope. Statistics F of homogeneity of pre-test and post-test regression slope for variables of psychological well-being and resilience are not significant in two experiment and control groups (Psychological well-being,  $F=2.50$ ,  $P<0.10$ , resilience  $1.96$ ,  $P<0/16$ ). Therefore, the pre-test and post-test regression slope in the two groups is equal and the hypothesis of regression slope equivalence is established. Levine homogeneity variance test was used In order to check variance homogeneity of two groups in the post-test stage. Levine test was not statistically significant for any of studied variables, psychological well-being ( $F = 0.55$  and  $P = 0.46$ ) and resiliency ( $F = 1.86$  and  $P = 0.18$ ). Therefore, the hypothesis of variances homogeneity was not rejected. Another factor is the linear relationship between variables. There is a linear relationship between synchronous

variable (pre-test scores of psychological well-being) and dependent variable (post-test score for psychological well-being) with linear coefficient of 0.21. Also, there is a linear relationship between the synchronous variable (pre-test resilience score) and the dependent variable (post-test resilience score) with linear coefficient of 0.66. Therefore,

the hypothesis of the linearity of relationship between variables was also met. Kolmogorov-Smirnov test was used to determine distribution of population (Normality of the data). The level  $P > 0.05$  was a measure for distribution of society. Given the establishing multivariate covariance analysis hypotheses, the use of this test was allowed.

## Findings

**Table 2: Mean and standard deviation of psychological well-being and resilience scores of experiment and control groups in pre-test and post-test stages**

variables	Statistical Indices	Experiment group		Control group	
		Pre-test	Post-test	Pre-test	Post-test
Psychology well-being	Mean	56.33	46.66	57.06	57.46
	Standard deviation	2.12	2.16	2.31	3.68
resilience	Mean	48.40	58.33	49.26	49.13
	Standard deviation	1.35	3.41	1.53	1.68

Table 2 shows the mean and standard deviation of psychological well-being and resilience scores in both pre-test and post-test stages of two experiment and control groups. As it can be seen, the experiment group scores in the post-test has increased compared to the pre-test. The mean and standard deviation of experimental group age were respectively 35.53 and 8.40, and the mean and standard deviation of the control group were respectively 33.87 and 7.93. Findings show that there is a significant difference between the experiment and control groups ( $p < 0.001$ ) in terms of dependent variables (Table 3). On this basis, it can be stated that there is a significant difference between the two groups in at least one of the dependent variables (psychological well-being and resilience). One-way covariance analysis in Monova's text was conducted on the dependent variables to examine the difference point (Table 4).

**Table 3: The results of multivariate covariance analysis on the mean of post-test scores of psychological well-being and the resilience of the experiment and control groups**

Name of test	value	F	df hypothesis	df error	Significance level	ETA Coefficient	Statistical power
Pillai's Trace	0.87	71.75	2	21	0.001	0.87	1
Wilkes Lambda	0.12	71.75	2	21	0.001	0.87	1
Hotelling's trace	6.83	71.75	2	21	0.001	0.87	1
Roy's largest root	6.83	71.75	2	21	0.001	0.87	1

**Table 4: The results of analysis of covariance on the mean of post-test scores of psychological well-being and the resilience of the experiment and control groups**

Variables	source of Changes	Sum of squares	Freedom degree	Mean of squares	F	Significance	ETA square	Statistical power
Psychological well-being	Pre-test	20.46	1	20.46	2.35	0.13	0.08	1
	Group	407.97	1	407.97	46.95	0.001	0.63	
Resilience	Pre-test	18.00	1	18.00	2.62	0.11	0.08	1
	Group	641.16	1	641.16	93.54	0.001	0.77	

According to the results of Table 4, one-way analysis of covariance is significant in the variables of psychological well-being ( $F = 46$ ,  $P < 0.001$ ) and resilience ( $F = 54/93$  and  $P < 0.001$ ).

The statistical power indicates the adequacy of sample size for analyses. The result is that there is a significant difference between the divorced women who received the hope therapy (the experiment group) and the divorced women who did not receive the hope therapy (control group).

## Conclusion

The purpose of this study was to investigate the effectiveness of hope therapy training on psychological well-being and resilience in divorced women. The findings of this study showed that hope therapy training has been effective on the psychological well-being of divorced women. This result is consistent with the research findings of Ong et al. (2006), Snyder and Tsukasa (2005), Bailey & Snyder (2007), Movahedi and Babapour Kheyroldin (2013)(22, 23, 25, 33).

In explaining the effect of hope therapy on the first variable, i.e. psychological well-being, Bailey and Snyder (2007) believe that hope is a positive incentive mode with clear goals for life. The role of hope in life is as a supportive mechanism that promotes the growth and improvement of human quality of life. Increasing the level of hope increases individual positive qualities and sets goals in life; it leads to meaningfulness of life, relaxation, energy and vitality in individuals. Werner (2012) conducted face-to-face interviews with 172 patients with severe psychiatric disorders and found hope causes psychological well-being and as a result, a recovery process(34).

According to Snyder (2000), there are three objective obstructive patterns that make a person susceptible to the disease, including blocking an important goal, selecting goals that are not satisfactory and the general expectation for failure. In hope therapy, it is trying to modify these patterns in the patient. In this regard, they are taught to create more goals and generalize expectations for success through focusing on past successes and not interfere themselves with the past and see life in the present and at the future and thus improve psychological well-being. Hope raises psychological well-being and a sense of value and helps to build social relationships to get more support and thus better mental health(35).

The other finding of the present study indicated that the effect of hope therapy training on increasing the level of resilience in divorce women's. This finding is consistent with the findings of the research done by Berg et al. (2008) that indicated hope increases coping and tolerance of disease-induced pain(26).

In explaining the effect of hope therapy training on the second variable, resilience, it can be stated that since hope therapy as an intervention factor increases the person's ability to cope with the stressful condition of the disease, therefore it increases a person's resilience. Hope, in fact, creates a meaningful state, and gives a means of coping with hardships to a person who is in trouble and difficult situations to achieve the goal and adapt to the conditions. Hopeful people learn from it instead of focusing on bad events and use it in pursuit of future goals (27). Certainly, the main advantage of hope therapy over other psychological therapies, is to create hopeful thinking about life and to overcome the problems and destructive effects of it at different levels of life. People with high levels of hope in their lives, have experienced the same defeat as

others but they have built up a belief that they can compete with challenges and cope with the difficulties and increase their patience.

Anthony, Ong, and Bergman (2006) suggest that hope, by preserving negative emotions at a low level, provides supportive benefits for individuals and leads to a person's adaptive improvement. There is also a dynamic relationship among hope, stress and excitement; in people with high hopes, stresses are reduced. They are released more effectively from emotional problems and as a result their satisfaction increases. In the intervention of hope therapy, the clients are taught to identify important, achievable and measurable goals(36).

One of the study limitations is that the present study was conducted on divorced women in Gilan Gharb Twon and it is better to do other research in other cities of the country to generalize the results of this research. Another limitation of this study is the lack of comparability of this approach with other therapeutic approaches. In this regard, it is suggested that the effect of this approach be compared with other commonly used therapeutic counseling approaches.

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# Effectiveness of Acceptance and Commitment Therapy on Death Anxiety and Death Obsession in the Elderly

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## Abstract

**Introduction:** The purpose of this study was to determine the efficacy of acceptance and commitment therapy on death anxiety and obsession in the elderly.

**Methods:** The research design was semi-experimental and pre-test-post-test type with control group. The statistical population included all men living in one of the elderly centers of Kermanshah City in 2016. After completing Templar death anxiety questionnaire (DAS) and Death Obsession (1998), 26 subjects who attained scores higher than the cut-off point in the scales of death anxiety, were randomly selected and assigned to experimental and control groups (13 in each group). Then, they participated in eight sessions (each for 90 minutes) protocol of therapy based on acceptance and commitment (Hayes et al., 1999) for the experiment group.

**Findings:** Data was analyzed using one-way covariance analysis. The findings of this study showed that there is a significant difference between the two groups of experimental and control in terms of death anxiety and death obsession ( $p < 0.001$ ).

**Conclusion:** The final achievement of this research was the positive effect of acceptance and commitment therapy on the improvement of death anxiety and obsession in elderly men.

**Key words:** Acceptance and Commitment Therapy, Death Anxiety, Death Obsession, Elderly

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## Introduction

Elderly is a stage in human life that naturally leads to a decrease in physical and mental abilities (1). The aging period, of course, on condition of survival, is unavoidable for humans (2). Older people are usually classified as over 65 years old (3). Today, the number of elderly around the world is estimated to be around 605 million people (4, 5), and the increase of this age on the world is estimated to be around 2 billion by the year 2050 (6). The population of the elderly in Iran will rise to more than 26 million in 2050, and its proportion to the total population will reach about 23% (7). Changes in the aging period include issues such as reduction of physical abilities, changing body responses to medications, experiencing important life events such as retirement, staying in nursing homes and reducing income (8), the lack of social support and less involvement in society (9). In addition to the decline in biological processes and the increase in the quality and quantity of the aging period, facing inevitable death and associated anxiety also play a role in creating mental disorders during this period (10, 11).

Death anxiety means constant and abnormal fear of death or dying. According to the definition of the British National Health Service, death anxiety means "a kind of panic or much worry when thinking about the process of dying or disconnecting from the world or what happens after death" (12, 13). Problems such as physical weaknesses against diseases, disabilities and the loss of relatives and friends (mourning and loss) provide more evidence for thinking about death and anxiety in old age (14). The breakout of death anxiety in this period is higher than in other age groups (15, 16). Death anxiety is a common feature among the elderly which means fear of dying of oneself and others (17). Sainey, Pathidar & Cayor showed that people with chronic pain and the elderly experience more death anxiety (18). Death anxiety can increase a negative attitude toward aging and even lead to anxiety and fear of aging (19, 20).

In addition to the death anxiety, the elderly are disturbed through the thoughts about death and dying. Death obsession involves repetitive or ruminant thoughts, persistent beliefs or disturbing images around your own death or loved ones, summarized in three rumination factors of death, death domination and repetitive beliefs about death (21). Malteby and Dee (22) also enumerated these three factors. The concept of death obsession was initially introduced by Abdul Khaleq (23). He believes that there is a connection between death and obsession; death is a possible subject of obsession, so that we can talk about individual difference in the obsession with death, in other words, we can say that some people are worried about the issue of death (24). Shakil and Yousaf, in research entitled "Death obsession and Ruminants on Political Instability in Muslim Young People" found that there is a direct relationship between death obsession and rumination in adults (25).

One of the interventions that can affect death anxiety and obsession is the therapy approach based on acceptance and commitment. Acceptance and commitment therapy is rooted in a theory called the FRT of which the philosophical basis of this theory is also structural functionalism. The FRT states that language is important for describing classification, evaluation, problem solving, creativity and initiative, as well as for the development of human culture but at the same time, the language can be considered as a primary source of human suffering (26). In fact, the fundamental structure and concept in commitment and acceptance theory is that suffering and reflections are created by avoiding experiences, intertwined cognitions, failing to meet behavioral needs and not matching with fundamental values (27). Acceptance and commitment therapy consists of six processes that lead to psychological flexibility. These six processes include: acceptance, neutralization (fault), own- underlying, communicating with the Current moment, values and commitment act (28). The purpose of the acceptance and commitment therapy is not to directly change for the referent, but to assist the referent in order to communicate with their experiences in different ways and be able to fully engage with a meaningful life based on value (29). Haker, Stone & Bakbas found some evidence on the effectiveness of acceptance and commitment therapy for anxiety and depression compared to other active control conditions (30). Graham, Gillanders, Stuart and Gouick showed that psychotherapy is an effective way for acceptance and commitment therapy in the therapy of essential depression, anxiety and stress in people with stroke with cardiac dysfunction and dizziness (31).

Twohig, Whittal, Cox, and Gunter demonstrated a reduction in the symptoms of practical obsession with acceptance and commitment therapy (32). Izadi and Abedi concluded that acceptance and commitment acceptance could be an effective therapy for patients with drug-resistant obesity (33). The elderly are not immune to death anxiety and depression; psychologists know well some types of depression and death anxiety are used as a good way to improve yourself and they ruin their final years. Therefore, it is important to carry out research and medical interventions to prevent mental disorders during old age due to the increasing number of elderly people in the country and considering the physical and psychological outcomes of anxiety and obsession in the elderly. Also, since it has not previously been conducted any research to evaluate the effectiveness of acceptance and commitment therapy on the death obsession and anxiety of elderly people within the country, the purpose of the present study was to investigate the efficacy of acceptance and commitment therapy on death anxiety and obsession in the elderly.

## Methodology

### Research design and participants

The research design was semi-experimental and post-test pre-test type with control group. The statistical population consisted of all elderly residents of elderly centers in Kermanshah City. The sample was selected using available sampling method from among the elderly men who were members of the Farzanegan Center in Kermanshah City. Twenty-six elderly men were randomly divided into two, experimental and control, groups. The terms of participating in the study were: age 60 and above, having satisfaction with participating in the research, proper listening and speaking ability and having no history of mental illness in the hospital, and exclusion criteria included simultaneous attendance at other psychotherapy sessions, as well as refusal to continue participating in training sessions.

### Tools

**Death Anxiety Questionnaire:** This questionnaire was developed by Templer (34) and contains 15 articles that measure the attitude of the subjects to death. Subjects specify their answers to each question with the option yes or no. The answer yes indicates death anxiety in the person. Thus, scores of this scale can range from 0 to 15, of which a high score indicates high levels of anxiety about death in people. Templar Anxiety death Scale is a standard questionnaire and has been used in various research worldwide to measure anxiety. The scale re-test coefficient is 0.83 and its concurrent validity based on correlation with the clear anxiety is 0.277 and the depression scale has been reported 0.40 (35). Two scales of worry about death and clear anxiety were used to investigate the validity of the Templar death anxiety scale. The result was 0.40 for anxiety scale correlation coefficient with a death anxiety scale 0.34 for anxiety correlation coefficient with clear anxiety scale.

**Death Obsession Scale:** This scale was created by Abdul Khalil in 1998. It has 15 items and has three factors that are respectively: Death rumination, death domination and repeated beliefs related to death. Abdul Khaleq (23) reported Cronbach's Alpha coefficient for the whole scale 0.90 and for its factors 0.92, 0.92 and 0.92 respectively. The simultaneous validity of this tool is calculated by calculating the correlation coefficient with similar scales. Correlation coefficient of Death obsession Scale with Death anxiety Scale has been reported 0.62, Death Depression 0.57, general Obsession 0.46, General Anxiety 33.0, General Depression 0.42 and Izang Psychosocial Scale of Personality Inventory 0.35 (23). In Iran, the simultaneous validity of this scale through its simultaneous implementation with the death anxiety scale was 0.76 and its retest reliability coefficient 0.73(36).

**Training sessions:** The protocol of the training sessions were taken based on the research done by Hayes, Streswell and Wilson (37) in 8 sessions of 90 minutes. The summary of the content meeting of each session is presented below.

## Procedure

After obtaining the necessary permission to conduct the research, the research sample was selected and randomly divided into two, experiment and control, groups based on the score of death anxiety and death obsession questionnaire according to the criteria for entering and leaving through sampling from male residents of Farzanegan nursing homes in Kermanshah City (26 elderly men qualified to participate in the study). Then, the experimental group received 8 sessions of acceptance and commitment therapy, while the control group did not receive any intervention. At the end of the intervention, both groups answered the questionnaires. The therapy protocol was implemented by the researcher. The data were analyzed using SPSS application version 21 and covariance analysis statistical method.

**Table 1: The acceptance and commitment therapy protocol**

Session	ACT
1	The limits of control (short and long-term costs and benefits; finger traps), focus on experience (body scan)
2	Values (what you care about, how you want to live your life)
3	Cognitive defusion (observing thoughts without trying to evaluate or change them)
4	Mindfulness (being in the moment, raisin exercise)
5	Committed action ("road map" connecting values, goals, actions, obstacles, and strategies)
6	Self as context. Metaphor: "Chessboard"
7	Review and continued action in support of values
8	Moving forward

## Findings

The descriptive findings of the present study including statistical indices such as mean and standard deviation of the variables studied, are presented in Table (2).

**Table 2: Mean and standard deviation of death obsession in pre-test and post-test of variables studied**

Groups	Statistical indices	Pre-test	Post-test
experiment	Mean	9.45	5.58
	Standard deviation	1.78	1.23
control	Mean	9.38	9.61
	Standard deviation	1.33	1.81

As Table 2 shows, the mean and standard deviation of the pre-test of the death anxiety variable were 9.45 and 1.78 in the experimental group and 9.38 and 1.33 in the control group. In the post-test stage, the mean and standard deviation of experiment group decreased to 5.58 and 1.28 and in the control group it was 61.9 and 1.81. As it can be seen, the mean of death anxiety in the experimental group in the post-test is less than that in the control group.

**Table 3: Mean and standard deviation of death obsession in pre-test and post-test of two groups**

Groups	Statistical indices	Pre-test	Post-test
experiment	Mean	21.59	12.54
	Standard deviation	14.45	8.15
control	Mean	22.18	21.05
	Standard deviation	13.84	14.10

As Table 3 shows, the mean and standard deviation of the pre-test of the death obsession variable were 21.59 and 14.45 in the experiment group and 22.18 and 13.84 in the control group. In the post-test stage, the mean and standard deviation of experiment group decreased to 12.54 and 8.15 and in the control group it was 21.05 and 14.10. As it can be seen, the mean of death obsession in the experimental group in the post-test is less than that in the control group. Before the covariance analysis test, normalization hypothesis using the Kolmogorov Smirnov test, homogeneity hypothesis of variances in two groups by using Levine's test, homogeneity hypothesis of regression slope using variance test were assessed and all in two death anxiety and torment of death variables with alpha greater than 0.01 were confirmed.

**Table 4: Kolmogorov-Smirnov test to examine the normalization hypothesis of variables in the two groups**

Kolmogorov-Smirnov test					
Variable	test	group	statistics	Freedom degree	Significance level
Death anxiety	Pre-test	Experiment	0.14	13	0.33
		Control	0.17	13	0.33
	Post-test	Experiment	0.16	13	0.33
		Control	0.16	13	0.33
Death obsession	Pre-test	Experiment	0.13	13	0.25
		Control	0.21	13	0.25
	Post-test	Experiment	0.21	13	0.25
		Control	0.21	13	0.25

As Table 4 shows, the normalization hypothesis in the death anxiety and death obsession variables was confirmed in the two groups with a significant level less than 0.01 ( $P < 0.01$ ).

**Table 5: F Levin test to examine the same hypothesis of variances in the two groups**

Variables	Statistical Indices			
	Freedom degree 1	Freedom degree 2	F	Significance level
death anxiety	1	24	3.13	0.082
death obsession	1	24	2.64	0.076

As Table 5 shows, F Levin test with a significant level less than 0.01 was confirmed to examine the same hypothesis of variances in the two groups ( $P < 0.01$ ).

**Table 6: Variance test for regression slope in death anxiety and death obsession variables in two groups**

variables	Source statistic index	Sum of squares	Freedom degree	F	Significance level
death anxiety	group	11.09	1	2.56	0.071
	Pre-test	323.36	1	85.71	0.197
	Group, pre-test	0.017	1	0.186	0.956
	error	81.75	22		
	total	7906.15	26		
death obsession	group		1	14.78	0.126
	Pre-test		1	76.69	0.089
	Group, pre-test		1	2.45	0.687
	error		22		
	total		26		

According to the results of Table 6, variance test to examine regression slope in two groups was confirmed with  $F = 0.186$ , significance level 0.956 in death anxiety; it was confirmed with  $F = 2.45$  and significance level 0.687 death obsession variables in death obsession variable.

**Table 7: Results of single-variable covariance analysis on moderated scores of the studied variables**

Variables	Sum of squares	Freedom degree	F	Significance level	Effect size
Death anxiety		1	46.51	0.001	0.86
Death obsession		1	71.35	0.001	0.72

According to Table 7, the results of one-variable covariance analysis between the two groups on the moderated scores of death anxiety with  $F = 46.51$  and significant level 0.001 and for death obsession ( $F = 71.35$ ) and significant level 0.001 indicate a significant difference between the two groups with 99% confidence ( $P < 0.01$ ). Acceptance and commitment therapy with effect size of 0.86 and 0.72 can explain 86% of the variance of death anxiety and 72% of variance of death obsession.

## Conclusion

The purpose of this study was to investigate the efficacy of acceptance and commitment therapy on reducing death anxiety and death obsession in the elderly. According to this purpose, two groups were studied. The two groups were analyzed in two stages: pretest and post-test using Templer Death Anxiety Questionnaire and Abdolkhaleq Death Obsession Questionnaire. The results of this study showed that acceptance and commitment therapy has a significant effect on the reduction of anxiety and death obsession in the elderly. The results are consistent with the studies of Kakavand et al. (38), Yazdanbakhsh et al. (39), Jani, Molaie, Gangi, Gharche, Bigloo and Pour Esmaeili (40), Aziz and Mominie (41) and Faramarzi, Askari and Taqavi (42). Also, the results of this study are consistent with the results of Mojdehi et al. (43) which investigate the therapy mediators and the effectiveness of acceptance and commitment therapy in reducing the symptoms of general anxiety disorder.

According to the theory of social abandonment, when elderly people are waiting for death, there is a mutual retreat between them and society and older people reduce their activity level and interact less and entertain more in

their inner world (44). According to ACT theorists, empirical avoidance is an important factor in the creation and maintenance of psychological injuries, including anxiety. Experimental avoidance means negative exaggeration of internal experiences and reluctance to experience them, which leads to attempts to control or escape them and can interfere with a person's performance (27). Accordingly, the purpose of acceptance and commitment therapy is to reduce empirical avoidance and increase psychological flexibility by accepting unavoidable and unpleasant emotions such as anxiety, raising awareness and identifying personal values related to behavioral goals. Theorists such as Eifert and Henfer (45) believe that acceptance-based approaches, instead of emphasizing the reduction of anxiety, tend to foster their experience and the exposure to these unpleasant emotions by identifying values and linking behavior to personal values and goals. As Joredine and Devlin (46) also showed in their case study that acceptance and commitment therapy reduces the anxiety of the individual by reducing the empirical avoidance and increasing psychological flexibility.

The pivotal processes of acceptance and commitment therapy in this study were to educate the techniques that patients used to control thought, meaning how to deal with

the disturbing thoughts about death and how to manage and control their emotions. Using admissions in the process of acceptance and commitment therapy makes people suffer less from obsession-caused situations. It should be noted that in acceptance and commitment therapy, focusing on obsessive thoughts and behavior is not straightforward, but using acceptance and faults techniques, unpleasant excitement has a downward process and consequently, the death obsessive thoughts and behavior is reduced. One of the important techniques in acceptance and commitment therapy is to specify values for references, as new values are defined and replaced instead of the values defined in the cognitive process of the patient; this re-evaluation, in individuals' cognitive process, reduces their obsessive thinking. Cognitive flexibility also teaches individuals that the existence of death obsessive thoughts is not the main issue, but the main thing is to respond to these thoughts as obsessive behaviors. Therefore, by learning cognitive flexibility, they are trained to gain a wider behavior treasury. It can be concluded that acceptance and commitment therapy, without focus on the symptoms of death anxiety and death obsession and the lack of efforts to suppress obsessive thoughts, can help to reduce death anxiety and death obsession in the elderly.

The research population consisted of men living in Farzanegan nursing homes in Kermanshah City, so that the results should be generalized with caution. One limitation of this study is the lack of this therapy with others. In this regard, it is suggested that further research studies the effects of other therapies along with this therapy in different time and place situations on a larger sample group.

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# The correlation between spiritual wellbeing and depression in elderly patients with cancer in Iran

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## Abstract

**Background and Objective:** Being elderly is the most significant risk factor for incidence of cancer. Cancer can adversely influence the spiritual health of elderly patients. Moreover, spiritual health influences other aspects of health and has received considerable research interest. Therefore, the present study aimed to investigate the correlation between spiritual health and depression among elderly patients with cancer.

**Methods:** This was a cross-sectional descriptive-analytic study in elderly patients (n=180) diagnosed with respiratory, breast, and gastrointestinal cancer and who referred to the Hospitals affiliated with one of the Medical Universities in Tehran, Iran during 2016. The relevant data were collected using a demographic information questionnaire, Geriatric Depression Scale (GDS), and Alison Palutzin Questionnaire. To analyze the data, the statistical software Stata (Windows, version 13) was used. Descriptive statistics (number, percentage of frequency, mean, and standard deviation) and analytical statistics (linear regression and Pearson correlation coefficient) were used and the statistical significance level was set at  $p \leq 0.05$ .

**Results:** A significant inverse correlation was observed between spiritual health and depression ( $P=0.001$ ,  $r = -0.54$ ) in elderly cancer patients. Furthermore, an inverse and significant correlation was observed between religious ( $r=-0.23$ ,  $P=0.002$ ) and existential ( $r=-0.59$ ,  $P=0.001$ ) dimensions of spiritual health and depression in these patients.

**Conclusions:** Findings of this study demonstrated that spiritual health is an important factor for the health of elderly patients with cancer and the religious and existential dimensions of spiritual health are the main mechanisms for depression reduction. It is recommended to adopt a comprehensive nursing care program to improve the spiritual health of these patients.

**Key words:** Depression, Spiritual health, elderly, cancer, healthcare

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## Introduction

In the USA and other countries all over the world, cancer is regarded as one of the most important health threats (1). In 2015, cancer was responsible for 8.8 million deaths worldwide (2) and it is the third leading cause of death in Iran (3). Cancer is usually affected by age; in such a way that most individuals of 65+ years are diagnosed with different types of cancer (4). Nowadays, this disease is one of the most prevalent chronic diseases worldwide and its prevalence and occurrence rate increase as individuals get older (5). Patients diagnosed with cancer also experience many mental disorders such as adjustment, having a depressed mood, anxiety, and lack of self-confidence. These patients are most likely to suffer from severe depression and other mental disorders at advanced stages (6).

Depression is one of the most prevalent disorders in cancer patients, especially in elderly patients (7), which might affect their decision-making skills, continued treatment and various aspects of the patients' lives. Prevalence of depression in cancer patients has been estimated between 5 and 30%. (8). One of the most prevalent and common psychological disorders of old age is basic depression (9) with a prevalence of 71.8% in older adults (10).

Awareness of cancer diagnosis and longterm and invasive treatments are an unpleasant and shocking experience and in many cases, because of this distasteful experience, the patients are unable to enjoy their lives.

(11, 12). Because of this unpleasant experience, a significant increase is seen in the spiritual needs of the patients (13) and they might be at risk of suffering from spiritual distress (12). Cancer leads to changes in perception of life in the cancerous patients and cause physical, mental, social, economic and family problems (14). Generally, there are numerous concepts that are always taken into account in association with how patients are facing the problems and the tension caused by this disease, one of which is the concept of spiritual health (15-16).

Spiritual health is one of the dimensions of health which establishes a coherent and integrated relationship between the inner forces of individuals who are spiritually healthy, feel close to themselves, God, society and the environment they live in and has them experience a sense of peace and stability in life (17). This concept has two dimensions: a religious dimension and an existential dimension. Religious health refers to a sense of satisfaction because of having a connection with a higher power and existential health refers to the effort that is made by an individual to understand the meaning and purpose of life (18-19).

Many scholars believe that spirituality can overshadow all of the aspects of humanity and it can be defined as a cohesive dimension of anyone's health and welfare (20).

Nurses play an important role in preserving a good level of health and quality of life of elders and their families throughout their cancer treatment (21). Studies focusing on spiritual support, particularly for cancer patients, have shown that nurses should utilize the effect of spirituality and religiousness on shaping the meaning of life and death in the minds of patients and discovering ways in coping with physical and mental tensions. Taking care of patients in terms of spirituality is just like other aspects of taking care of them and it must be done based on nursing protocols. It is necessary for nurses to become aware of the spiritual needs of patients as well as the probable effects of the disease they are currently suffering from and their spiritual experiences during their treatment. Respecting the spiritual beliefs of a patient and incorporating these beliefs in their care treatment process is of crucial importance (22).

Gonzalez et al. (2014) and Bekelman et al. (2007) demonstrated a relationship between spiritual health and depression in cancer patients; while some studies have shown that there is an inverse significant relationship between spiritual health, depression, and anxiety in patients diagnosed with advanced cancer; but there is no significant relationship between religious health and depression (23). In the studies of Nsameng (2016) and Khezri (2015), there are no relationships between the average total score of spiritual health and its religious dimension and depression. Also, findings indicted the absence of a relationship between religious and believing in life after death and depression in cancer patients (24).

Increasing population ageing during recent years, high prevalence of cancer and the negative effects of cancer and associated comorbidities, especially depression, have necessitated the need for paying special attention to this subject. The controversial findings of different studies have confirmed the need for research on this issue. On the other hand, there are social, cultural, and religious differences in spiritual beliefs between Iran and other countries which might affect various aspects of people's lives and health. In addition, the growth in elderly population (the old age crisis) (25) also affirms that it is necessary to conduct more research in this field. The present study aimed to investigate the correlation between spiritual health and depression among the elderly patients with cancer in the selected Hospitals affiliated with one of the medical Universities located in Tehran city, Iran.

## Materials and methods

This was a cross-sectional descriptive-analytic study investigating the correlation between spiritual health and depression among the elders with cancer. The study population consisted of all of the elderly men and women diagnosed with respiratory cancer, breast cancer, and gastrointestinal cancer referred to the Hospitals affiliated with one of the Medical Universities in Tehran city, Iran during 2016. The study subjects (n=180) were selected using purposive sampling and based on the inclusion and exclusion criteria of the study.

**Sample size:** Considering the estimated alpha (0.05), power (80%) and correlation coefficient (22%) (Khezri et al.2015), the sample size was calculated at 160. To compensate for the attrition of the patients the sample size of this study was considered 10% higher than the calculated size (n=180).

**Inclusion and exclusion criteria:** The inclusion criteria for this study were: age of 60 years old and higher, literacy, cancer diagnosis with a minimum history of 6 to 8-month Report of the disease. The reason behind defining the minimum history of 8 months of cancer as the main criterion of inclusion is that after this period the patient has supposedly past the severe mental effects of the diagnosis and treatment of cancer and has completed the mental phases of accepting the disease (26). The exclusion criteria of the study were as follows: unwillingness to participate in the study, suffering from mental retardation, dementia or schizophrenia, and drug abuse.

**Questionnaires:** Three questionnaires were used in this study as tools for collecting data. One of these questionnaires is the questionnaire used for gaining demographic information about the patients (age, gender, profession, level of income, type of cancer, time of diagnosis, etc.) and the other two were Geriatric Depression Scale (GDS) and Paloutzian and Ellison's Spiritual well-being Questionnaire. The mental health questionnaire had 20 items. A 6-point Likert scale was used in this questionnaire (from totally disagree to totally agree). In this scale, spiritual health has two domains: religious health and existential health. Each includes 10 items which yield a score ranging from 10 to 60. The odd phrases show the level of religious health of the participants and the even phrases show the level of existential health of the participants. Total score obtained from each participant is the sum of scores of the two subscales (20 to 120). In total, the obtained scores can be classified as follows: low spiritual health 20 to 40, average spiritual health 41 to 99, and high spiritual health 100 to 120 (18). In Iran, Seyedfatemi et al. (2006) used this questionnaire and reported the Cronbach's alpha coefficient of 0.82 of this questionnaire, confirming the reliability of the questionnaire (27). Moreover, the reliability and validity of the questionnaire have been confirmed in many types of study (27). In a study conducted by Baljani et al. (2011), the reliability of the questionnaire was confirmed by using Cronbach's alpha coefficient of  $r=0.88$  (28).

The GDS questionnaire consists of 15 items with two-point responses (yes/no). Achieving a score of 5 means the presence of depression and higher scores indicate more severe depression. Validity and reliability of this questionnaire were measured in various studies and the Cronbach's alpha coefficient of this questionnaire was 0.84.

In this study, content validity and face validity were used for determining the validity of the tools. To determine the content validity of the tool, this questionnaire was distributed among 10 members of the faculty of nursing and midwifery. The obtained results were indicative of the

content validity of the questionnaire; total CVI (Content Validity Index) was 0.95 which was acceptable.

To measure the reliability of the tools used in this study, the internal consistency method was used. To determine the internal consistency through Cronbach's alpha coefficient method, the questionnaires were given to 30 older adults diagnosed with cancer who had the specifications of the units under study. Cronbach's alpha coefficient for the spiritual health tool was 0.82 and it was 0.86 for older adults' depression.

**Ethical considerations:** All of the experimental procedures and protocols of this study were approved by the local ethics committee of Shahid Beheshti Medical University, Tehran, Iran (registration code: IR.SBMU.PHNM.1395.484). The researcher visited the relevant health care centers and clearly explained the objectives and procedures of the study and the significance of the study to all potential participants along with sufficient information about the study including research objectives and the importance of conduction of the research and the fact that participants remain anonymous, participation in the study is voluntary, and the obtained information remain confidential. Then, the questionnaires were distributed to the qualified patients to be filled out.

**Statistical Analysis:** To analyze the data, the statistical software Stata (Windows, version 13) was used. Descriptive statistics (number, percentage of frequency, mean, and standard deviation) and analytical statistics (linear regression and Pearson correlation coefficient) were used for describing the data. For all statistical analyses the statistical significance level was set at  $p \leq 0.05$ .

## Results

In this study, 180 cancer patients in the age group of over 60 years participated with the mean and standard deviation of  $65.13 \pm 5.71$  years. In terms of gender, 54% (98 patients) were female and 45% were male (82 patients). Mean and standard deviation of the duration of diagnosis with the disease was  $26.62 \pm 23.08$  months with a range from 6 to 180. 55% of the samples (99 patients) lived in Tehran and 45% (81 patients) lived in other cities. The most prevalent type of cancer was gastrointestinal cancer. In terms of education, the maximum frequency was that of an elementary school diploma (61.11%) and academic degree (7.22%). Most of these patients were unemployed, 25% of them were retired (45 patients) and 11.67% of them were employed. 48.33% of these patients lived with their spouses and their children. 17.22% of the patients under study stated that they have a record of depression.

The result of simple linear regression analysis showed that the variables of academic degree ( $P=0.03$ ), retirement ( $P=0.005$ ), +306-dollar income ( $P=0.006$ ), and the variable "who do you live with?" (Spouse and children  $p=0.02$ ) have a significant relationship with depression in elders (Table 4). However, there was no significant relationship among the variables age, gender, marital status, type of cancer, a report of depression, diagnosis with other patients'

**Table 1. Distribution of the mean score of spiritual health and its dimensions and depression in elders**

Variable		Number	Mean	Standard deviation	Minimum	Maximum	Confidence interval of 95%	
							Low level	High level
Spiritual health	Total	180	86.22	10.35	53	114	84.96	87.74
	Religious dimension	180	46.03	4.31	20	56	45.40	46.67
	Existential dimension	180	40.2	7.80	15	59	39.05	41.34
Depression		180	6.5	4.05	0	15	5.93	7.12

**Table 2. Correlation between spiritual health and its dimensions and depression in the elders participating in the study**

Variable		Existential health	Religious health	Spiritual health	Depression
Existential health	Correlation coefficient	1.00			
	P-value	Reference group			
Religious health	Correlation coefficient	0.41	1.00		
	P-value	0.001	---		
Spiritual health	Correlation coefficient	0.92	0.72	1.00	
	P-value	0.001	0.001	---	
Depression	Correlation coefficient	-0.59	-0.23	-0.54	1.00
	P-value	*0.001	*0.002	*0.001	---

**Table 3. Distribution of the mean score of spiritual health and depression based on the type of cancer**

Cancer	Spiritual health				Depression			
	Mean	Standard deviation	Minimum	Maximum	Mean	Standard deviation	Minimum	Maximum
Breast cancer	87.24	11.46	53	111	6.06	4.61	0	15
Respiratory Cancer	84.41	10.01	68	108	7.33	3.91	1	15
Gastrointestinal cancer	86.75	9.83	57	114	6.29	3.73	0	14

duration of diagnosis with cancer and place of residence and depression in elders. Moreover, there was a direct and significant relationship between spiritual health and employment status (retirement,  $P=0.005$ ) and +306-dollar income at the level of 0.03. There was no statistically significant relationship between spiritual health and other variables.

In this regard, the results show that old patients who live with their "spouse and children" had a higher depression score than those who only live with their "spouse". On the

other hand, employed and Emeritus old patients had a lower depression score than unemployed old patients. In addition, old patients with an academic degree had a lower depression score than those with an elementary diploma. No significant relationship was observed between the depression variable and other variables. Furthermore, there was no significant relationship between the demographic variables and spiritual health in elders (by controlling the destructive effect of other variables at the level of  $\alpha = 0.05$ ).

Table 4. Relationship between demographic variables and mental health and depression

Variable		Depression score				Spiritual health score			
		$\beta$	Confidence distance of 95%		P-value	$\beta$	Confidence distance of 95%		P-value
			Low	High			Low	High	
Cancer	Breast	1.00	-	-		1.00	-	-	
	Respiratory	1.27	-0.32	2.86	0.117	-2.83	-6.92	1.25	0.173
	Gastrointestinal	0.23	-1.22	1.67	0.758	-0.49	-4.20	3.21	0.792
Age	Age	-0.03	-0.13	0.08	<b>0.629</b>	-0.01	-0.27	0.26	<b>0.960</b>
Gender	Male (base)	1.00	---	---	Reference group	1.00	---	---	Reference group
	Female	-0.44	-1.64	0.75	<b>0.465</b>	0.08	-2.98	3.15	<b>0.957</b>
Education	Elementary school	1.00	-	-	Reference group	1.00	-	-	Reference group
	Middle school	0.65	-1.08	2.38	0.460	-3.34	-7.83	1.16	<b>0.145</b>
	High school	-0.57	-2.14	1	0.473	1.36	-2.71	5.44	<b>0.510</b>
	University	-3.56	-5.85	-1.27	0.003	4.25	-1.71	10.20	<b>0.161</b>
Employment	Unemployed (base)	1.00	---	---	Reference group	1.00	---	---	Reference group
	Employed	-1.74	-3.60	0.11	<b>0.066</b>	4.20	-0.56	8.95	<b>0.084</b>
	Retired	-1.97	-3.35	-0.60	<b>0.005</b>	5.04	1.51	8.56	<b>0.005</b>
Income	Less than 184 dollars (base)	1.00	---	---	Reference group	1.00	---	---	Reference group
	184-306 dollars	-1.04	-2.28	0.21	<b>0.102</b>	2.78	-0.42	6	<b>0.089</b>
	More than 306 dollars	-3.36	-5.75	-0.98	<b>0.006</b>	6.80	0.65	12.96	<b>0.030</b>
Marital status	Other (base)	1.00	---	---	Reference group	1.00	---	---	Reference group
	Married	0.34	-1.11	1.78	<b>0.644</b>	2.21	-1.48	5.91	<b>0.238</b>
Who do you live with?	Spouse (base)	1.00	---	---	Reference group	1.00	---	---	Reference group
	Children	1.74	0.26	3.74	<b>0.088</b>	-1.36	-6.57	3.86	<b>0.608</b>
	Spouse and children	1.62	0.21	3.04	<b>0.025</b>	0.05	-3.64	3.75	<b>0.977</b>
	Others	5.52	-2.45	13.49	<b>0.173</b>	-2.75	-23.53	18.02	<b>0.794</b>
	Alone	0.04	-2.02	2.11	<b>0.966</b>	-3.13	-8.51	2.25	<b>0.252</b>
Duration of diagnosis	Duration of diagnosis	-0.02	-0.04	0	<b>0.081</b>	0.03	-0.03	0.08	<b>0.295</b>
Record of depression	Yes (base)	1.00	---	---	Reference group	1.00	---	---	Reference group
	No	-1.16	-2.73	0.41	<b>0.146</b>	1.55	-2.49	5.59	<b>0.449</b>
Diagnosis with other diseases	Yes (base)	1.00	---	---	Reference group	1.00	---	---	Reference group
	No	-0.92	-2.17	0.33	<b>0.149</b>	1.90	-1.32	5.11	<b>0.246</b>
Place of residence	Tehran (base)	1.00	---	---	Reference group	1.00	---	---	Reference group
	Other cities	-0.30	0.90	0	<b>0.624</b>	2.15	-0.90	5.21	<b>0.166</b>

## Discussion

The present study aimed to determine the correlation between spiritual health and depression among elderly adults diagnosed with cancer. The results of the present study showed a significantly negative correlation between depression and spiritual health in elderly cancer patients ( $P=0.001$ ,  $r=-0.54$ ), which support the findings of the previous similar studies (14, 19, 27, 29, 35).

In the present study, the average total score of the spiritual health of the majority of elderly cancer patients was moderate. However, the findings of studies conducted by Rezayi et al. and Hojati et al. (36) in Iran showed that most of the cancer patients had high levels of spiritual health. This difference in the findings can be attributed to the studied populations in the two studies where Rezayi et al. studied only women diagnosed with breast cancer in Isfahan city, Isfahan, Iran, whereas our study investigated both male and female patients diagnosed with three different types of cancer (breast cancer, respiratory cancer, and gastrointestinal cancer) in Tehran city.

In the present study, the mean score of the religious dimension of spiritual health (46.3) was higher than the mean score of the existential dimension of spiritual health (40.2). This finding is consistent with the findings of some previous studies that investigated cancer patients (14, 19, 27, 29, 37, 39). The religious culture that is dominant in Iran, especially among elders, can be the cause of this difference. It is because of this dominant culture that the people, who live in a stressful condition, or those who are faced with crises caused by chronic diseases, tend to be more religious.

The results of the regression analysis indicated a significant inverse correlation between the religious and existential dimensions of spiritual health and depression in elderly cancer patients ( $r=0.41$ ,  $P=0.001$ ) (19, 30, 35, 38, 40); in the sense that as the religious dimension of spiritual health is enhanced, the patients become less depressed. These results do not support the findings of McCoubrie and Davies (2006), Mills et al. 2015 and Nsameng et al. (2017) and the cause of this incompatibility can be the cultural and religious difference between the countries under study. Religion can be a source of important resources that can protect cancer patients against depression (41). Given that Iranian people have strong religious beliefs and are strictly committed to their spiritual views, this finding seems logical.

Our analysis showed a significant inverse relationship between the existential dimension of spiritual health and depression. This finding supports the findings of Bekelman et al. (2007), Lee et al. (2014), and Musarezaie et al. (2012): Cancer patients with higher scores of the existential dimension of spiritual health are less depressed ( $P=0.0001$ ). Mills et al. (2015) showed that elderly cancer patients with higher scores of the existential dimension of spiritual health are less depressed. In other words, an increase in the level of spiritual health is an important factor for preventing elders from suffering from depression (42).

Our analyses showed no statistically significant relationship between spiritual health and any of the demographic variables presented in Table 4. These findings are consistent with the findings of the McCoubrie et al., Bekelman et al. All human beings have spiritual needs whether they are aware of them or not. Many of these needs appear as individuals get older and as they suffer from chronic diseases that affect different aspects of their lives (43). Therefore, these findings can indicate that all of us need spirituality regardless of our age, gender, education level, professional occupation, and type of cancer.

In this study, the prevalence and intensity of the depression was lower in the elderly cancer patients who live with their spouses, those who were retired, and employed elderly, and elderly with a higher educational level. This finding supports the findings of the study of Khezri et al. (2015) conducted in Iran and Mårtensson et al. (2008) conducted in Sweden. Since caretakers of more than half of elders are their spouses, they have someone who cares about their welfare, comfort, and safety (44). The reason behind the fact that these people are less depressed than others can be associated with the fact that Iranian families are quite family-oriented and believe that family members must respect each other and there is a strong connection between family and health status of family members (45). Perhaps, elders who are employed and better educated are less depressed because they have more social interactions are supported by their families and the societies they live in and are more aware of the health care principles. However, in their study, Khademvatani et al. did not observe a significant relationship between professional occupation and education and depression (46).

## Conclusion

Our findings showed that spiritual health is a valuable resource for old cancer patients. Evidence shows that the existential and religious dimensions of spiritual health act as adjustment mechanisms for reducing depression. Thus, it is recommended to cancer patients to pay attention to their spiritual health so that the quality of their lives and their mental welfare can be improved.

Chronic diseases, such as cancer, affect patients' mind, body, and mentality. Since humans are essentially spiritual, spiritual cares are a part of the overall treatment process and are considered to be a part of an inclusive and comprehensive care program. Therefore, hospitals can present effective nursing interventions and improve the spiritual dimension of their care programs by developing an inclusive care program for nurses.

Clinical interventions help cancer patients through inspiring new meaning and purpose for their lives which resolve some of the disease associated issues and reduces their depression. Given the dominant culture in Iran and the unique features and characteristics of Iranian families, the family support system plays an important role throughout the treatment process and prevents patients from getting depressed. For reducing the depression of older adults, nurses can consider providing family-centered care. It is

obvious that being supported by one's spouse and family has a significant impact on the reduction of depression and its symptoms.

The present study has some limitations which should be considered in interpreting the findings and for future studies. This study has only studied old patients diagnosed with respiratory, breast, or gastrointestinal cancer in a large university in Tehran, Iran. It is recommended to conduct more comprehensive similar studies on the patients diagnosed with other types of cancer over the Tehran province. Furthermore, conducting further prospective and interventional studies are required.

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# The effect of anger management training through cognitive-behavioral procedure on reducing marital conflicts

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## Abstract

The main purpose of this research is reviewing the effectiveness of anger management training through cognitive-behavioral method on reducing marital conflicts among women of Tehran city. This research was tested by marital conflicts measurement questionnaire [1]. Sampling method is random and cluster. A district was randomly chosen from all educational districts of Tehran city and from that district a school was also randomly chosen. After registration of 60 voluntary mothers of students, 30 persons were randomly selected and assessed by marital conflict questionnaire. After the test, people were randomly positioned into two groups, experimental and control, with regular spacing. Then two groups were trained in anger management through cognitive-behavioral method (each group consisted of 15 persons). 20 days after ending the course, people of both groups were reassessed. Then the data was statistically analyzed.

Based on research hypotheses, the effect of anger management training on following variables was evaluated:

- 1- Increased cooperation,
- 2- promotion of sexual relationship,
- 3- increased support for children,
- 4- increased individual relationship with own family,
- 5- increased relationship with spouse's family and friends,
- 6- decreased emotional actions,
- 7- increased financial partnership between spouses.

After statistical data analysis by T-test, it was found that anger management training results in reducing marital conflicts in the above-mentioned 7 components.

**Key words:** Marital conflict, Anger management through cognitive-behavioral procedure

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## Introduction

Whereas family is where love is focused and is constant protective of different aspects of individual life and as the infrastructure of forming this little social system is couples' relationships, the root of most conflicts which are happened in marital life comes from establishing an improper relationship between couples, so relation skills play an important role in improving couples' relationship and consequently decreasing conflicts and adversary problems.

Traditionally we see the family as a place where love, rapport and support can be attained, despite adversity, where humans can take a breath and prepare to fight the outside world. But for millions of people with dysfunctional families, it is a fancy. Obviously no one intentionally wants to make the family dysfunctional but families accept that because they know no other way [2].

Mental health, body health and family health are affected by conflicts. Many researchers have reviewed the relationship between marital conflicts with depression anger, peptic disorders and diseases such as cancer. Adverse relations result in children's conflict with each other and with their parents as well as cause lack of health and competence in the relationship between family members [3].

The major cause of spouses' problems refers to their cognition and thinking. Cognitive-behavioral family clinicians believe that spouses are affected by their environment and their behaviors could be reformed through providing new educational methods, anger management, solving and controlling conflicts and so on. Through holding group training by cognitive-behavioral method, they could be trained in the special behavioral purposes which are themselves designed for facing illogical thoughts of spouses and other family members and directing the family to think in a new way.

Carlos Darna [4] established the first longitude assessment about spouses' training program. He wanted to know to what extent the mental training courses could reinforce kindness. So 1,370 spouses from 5 different cities of the USA participated in a training course and just after that and also after 6-8 months after ending the course they were assessed. It was concluded that kindness could be enhanced by training courses. His research showed that these courses have an extraordinary effect on sincerity, marital life matching, marital satisfaction and reduced conflicts and anger [5].

One of the common problems which are considered by couple therapists since a long time ago is marital conflict. This problem may have different forms and emerges in forms of depression of one or both spouses, addiction, conduct disorder of children, misbehavior and verbal abuses and physical violence which finally results in divorce [6, 7, 8].

Organization for Civil Registration in Iran shows that within the latest decades divorce and marital dissatisfaction are increasing. Reflecting on this matter, it is totally obvious for future generations. The experience of unexpressed and long-term anger could have harmful and consequences during the first years of marriage and even results in struggle, anger, isolation and finally divorce [9, 10].

All humans are willing to gleefully pass the rough path of life and by using any possible way and skill give it a new color when they feel that lost their happiness. According to behaviorism therapists, abnormal behaviors of couples come from feedback processes between them who their positive performance shall sometimes be increased by gaining and keeping cognitive-behavioral skills such as anger management, aggression management, love expression and proper decisions as well as they can find the proper path [11].

## Research purpose and hypotheses

The major orientation of the present research is inspired from cognitive-behavioral procedure especially behavioral model which is related to anger management in marital conflicts because assisting spouses to reach a better life plays an important role in the mental health of the society. According to conflict statistics, there is a wide range of disorders from marital relationship to reduced spousal cooperation, reduced sexual relationship, increased emotional reactions, reduced family relations with spouse's family, increased relationship with own family and separating financial affairs.

### Main hypothesis

Anger management training through cognitive-behavioral procedure is effective in reducing marital conflicts.

### Sub-hypotheses

**I** Anger management training through cognitive-behavioral procedure is effective on increasing spouses' cooperation.

**II** Anger management training through cognitive-behavioral procedure is effective on increasing sexual satisfaction.

**III** Anger management training through cognitive-behavioral procedure is effective on reducing emotional reactions.

**IV** Anger management training through cognitive-behavioral procedure is effective on increasing support for children.

**V** Anger management training through cognitive-behavioral procedure is effective on increasing relationship with spouse's family and friends.

**VI** Anger management training through cognitive-behavioral procedure is effective on increasing individual relationship with own family.

**VII** Anger management training through cognitive-behavioral procedure is effective on improving financial partnership between spouses.

## Definition of research variables

### A. Theoretical definition of anger management

This skill enables a person to recognize anger inside themselves and in others and knowing its effects on behavior can provide a more proper reaction to this emotion [12, 13].

Anger management skill is an initiated cognitive-behavioral process by which people can determine, discover or invent solution strategies for daily problems.

### B. Theoretical definition of marital conflict

Marital conflict is any struggles in marital life which cause imbalance in establishing a positive marital relationship.

### Sampling method and sample volume

The method of sampling is random and multiphase cluster sampling. Firstly district No. 6 was randomly selected among all Tehran educational districts, and then one school was selected from all schools of district No. 6. It was announced that in this school would be held some courses under the title of "Anger Management Training" within 8-10 sessions and as the goal of this training was married mothers in Tehran, the mothers with the following terms could voluntary register (fathers were not selected as the research population because they didn't participate and actively attend in training classes):

- 1- Being housewife (not working outside of home)
- 2- Age between 25 and 45
- 3- Married just once
- 4- Having at least one child
- 5- Minimum of 5 years marriage

After announcement, 60 people registered voluntarily. Among the applicants, 30 mothers were randomly chosen and assessed by marital conflict pretest [1]. Then to

randomly place people into the two groups (experimental and control), we put 15 people in the control group and 15 in the experimental group and then one of the groups, as the experimental group, were tested for anger management skills.

### Research tools

The tools of this research are marital conflict questionnaires [1]. Marital conflict questionnaire (MCQ) has been provided by Dr. Bagher Sanayi and Tahereh Barati according to clinical experiments in Iran. Its purpose is testing conflicts between husbands and wives and its main dimensions. This questionnaire has been distributed in a 111-person group consisting of 53 males and 58 females who referred to judicial authorities and/or consulting centers to remove their marital conflicts where a 108-person group consisted of ordinary couples (53 males and 55 females). The evidence group was chosen among MA students of Tehran city and employees who took or did not take a high school degree and who were working in Tehran educational district 2. In this tool, the higher score the more conflict and the lower score the less conflict and the better the relationship.

Research validity: Cronbach's alpha for the whole questionnaire on a 32-person group is 53% and its seven subscales are as follows:

Reduced cooperation 30%, reduced sexual relationship 50%, increased emotional reactions 73%, increased support for child 60%, increased individual relationship with own family 64%, decreased family relations with spouse's family and friends 64%, separated financial affairs (means each spouses took control of their own budget) 51% [1].

### Data analysis method

In this research independent T-test was used. This test was done to compare means of pretest and after-test scores of groups. SPSS was applied to data analysis.

## Data Results

### 1. Data description

**Table 1: Frequency and percentage of marriage age of applicants based on experimental and control groups**

	Experimental group		Control group	
	Frequency	Frequency %	Frequency	Frequency %
Under 15 years	-	-	1	7.1
15-20 years	8	57.14	9	64.28
21-25 years	5	35.17	1	7.1
26-30 years	1	7.1	2	14.28
30-35 years	-	-	1	7.1
<b>Total</b>	<b>14</b>	<b>100</b>	<b>14</b>	<b>100</b>

**Table 2: Frequency and percentage of marriage duration of applicants based on experimental and control groups**

	Experimental group		Control group	
	Frequency	Frequency %	Frequency	Frequency %
Under 5 years	1	7.1	-	-
6-10 years	4	28.57	1	7.1
11-15 years	5	35.71	5	35.71
16-20 years	1	7.1	2	14.28
More than 20	3	21.4	3	42.85
<b>Total</b>	<b>14</b>	<b>100</b>	<b>14</b>	<b>100</b>

**Table 3: Frequency and percentage of number of children of applicants based on experimental and control groups**

	Experimental group		Control group	
	Frequency	Frequency %	Frequency	Frequency %
One	6	42.9	2	14.3
Two	7	50	7	50
Three	1	7.1	4	28.6
four	-	-	1	7.1
<b>Total</b>	<b>14</b>	<b>100</b>	<b>14</b>	<b>100</b>

**Table 4: Frequency and percentage of spouse's marriage age of applicants based on experimental and control groups**

	Experimental group		Control group	
	Frequency	Frequency %	Frequency	Frequency %
Under 20 years	1	7.1	2	14.28
21-25 years	4	28.57	7	50
26-30 years	7	50	4	28.57
31-35 years	2	14.28	1	7.1
<b>Total</b>	<b>14</b>	<b>100</b>	<b>14</b>	<b>100</b>

**Table 5: Frequency and percentage of financial situation of family of applicants based on experimental and control groups**

	Experimental group		Control group	
	Frequency	Frequency %	Frequency	Frequency %
Good	2	14.3	4	28.6
Average	10	71.4	10	71.4
Bad	2	14.3	-	-
<b>Total</b>	<b>14</b>	<b>100</b>	<b>14</b>	<b>100</b>

## 2.Data inferential analysis

**Table 6: Levene's F-test to review equivalent of variances**

	Levene's F-test	Level of Significance
Marital conflicts	2.66	0.114
Reduced cooperation	3.47	0.073
Reduced sexual relationships	2.66	0.114
Increased emotional reactions	1.11	0.3
Increased support for children	0.065	0.801
Increased individual relationship with own family	5.71	0.024
Reduced relation with spouse's family & friends	2.61	0.117
Separating financial affairs	0.048	0.828

According to level of significance of Levene's test in marital conflicts scales and in all scales which is higher than 0.05, Levene's F-test null hypothesis (variances of two groups are equal) was confirmed in all scales except decreased individual relationship with own family. According to calculated level of significance related to above variable, as the  $P=0.024$  which is lower than error level of 0.05 the Levene's F-test null hypothesis was rejected.

**Table 7: T-test of independent groups to review difference of means of pre-test scores for marital conflicts and its subscales**

Variables	Groups	Qty	Mean	Standard deviation	Difference of means	T-ratio	df	Level of significance
Marital conflicts	Experimental	15	135.93	23.15	12.33	1.93	28	0.064
	Control	15	123.6	8.72				
Reduced cooperation	Experimental	15	14.66	3.88	1.26	1.006	28	0.323
	Control	15	13.4	2.94				
Reduced sexual relationships	Experimental	15	18.6	6.08	2.8	1.67	28	0.105
	Control	15	15.8	2.24				
Increased emotional reactions	Experimental	15	23.73	4.3	5.73	3.92	28	0.001
	Control	15	18	3.68				
Increased support for children	Experimental	15	17.93	4.35	-1.53	0.99	28	0.327
	Control	15	19.46	4.06				
Increased individual relationship with own family	Experimental	15	18.33	5.28	2.6	1.74	28	0.092
	Control	15	15.73	2.31				
Reduced relations with spouse's family & friends	Experimental	15	20.66	3.92	0.46	0.375	28	0.711
	Control	15	20.20	2.8				
Separating financial affairs	Experimental	15	20.13	3.18	0.2	0.15	28	0.882
	Control	15	19.93	4.06				

Conflicts scores and all their components except increased emotional reactions are higher than error level of 0.05 and the difference of means is not significant. So it can be said that the two experimental and control groups are almost at the same level in terms of marital conflicts except in the component of increased emotional reactions in pretest stage and after holding training sessions of anger management through cognitive-behavioral method.

**Table 8: Levene's F-test to review equivalent of variances**

	Levene's F-test	Level of Significance
Marital conflicts	2.451	0.129
Reduced cooperation	0.61	0.441
Reduced sexual relationships	5.034	0.033
Increased emotional reactions	0.272	0.606
Increased support for children	0.022	0.884
Increased individual relationship with own family	0.123	0.729
Reduced relations with spouse's family & friends	0.174	0.68
Separating financial affairs	1.622	0.213

All scores of Levene's F-test levels of significance related to marital conflicts ( $P=0.129$ ), decreased cooperation ( $P=0.441$ ), increased emotional reactions ( $P=0.606$ ), increased support for child ( $P=0.884$ ), increased individual relationship with own family ( $P=0.729$ ), decreased family relations with spouse's family and friends ( $P=0.68$ ) and separated financial affairs ( $P=0.213$ ) are higher than 0.05 and in these scores Levene's F-test null hypothesis (variances of both groups are equal) was confirmed.

Regarding level of significance of decreased sexual relationship ( $P=0.033$ ) which is lower than 0.05, Levene's F-test first hypothesis (variances of both groups are not equal) was confirmed.

**Main hypothesis:** Anger management training influences decreasing marital conflicts.

**Table 9: T-test of independent groups to review differential means of two groups (experimental and control) for marital conflicts**

Groups	Qty	Mean	Standard deviation	Difference of means	T-ratio	df	Level of significance
Experimental	15	-20.33	20.22	-21	-3.78	28	0.001
Control	15	0.66	7.34				
Total	30						

Calculated T ( $t=-3.78$ ,  $df=28$ ) in error level of 0.05 is significant and with confidence coefficient of 95% the null hypothesis of the research is rejected. So the observed difference between differential means of scores is not stochastic and it could be said that anger management training through cognitive-behavioral method was effective in decreasing marital conflicts.

**First sub-hypothesis:** Anger management training is effective in improving frequency of sexual relations.

**Table 10: T-test of independent groups to review difference of differential means of two groups (experimental and control) for sexual relationship**

Groups	Qty	Mean	Standard deviation	Difference of means	T-ratio	df	Level of significance
Experimental	15	-4.2	6.13	-5.26	3.25	28	0.003
Control	15	1.06	1.31				
Total	30						

Calculated T ( $t=-3.25$ ,  $df=28$ ) in error level of 0.05 is significant and with confidence coefficient of 95% the null hypothesis of the research is rejected. So the observed difference is not stochastic and it could be said that anger management training through cognitive-behavioral method was effective in improving frequency of sexual relations. Second sub-hypothesis: Anger management training influences support for child.

**Table 11: T-test of independent groups to review difference of differential means of two groups (experimental and control) for support for children**

Groups	Qty	Mean	Standard deviation	Difference of means	T-ratio	df	Level of significance
Experimental	15	-2.8	3.58	-0.4	0.274	28	0.786
Control	15	-2.4	4.35				
Total	30						

Calculated T ( $t=-0.274$ ,  $df=28$ ) in error level of 0.05 is not significant and the null hypothesis of the research is confirmed. So it could be said that anger management training through cognitive-behavioral method had no effect on increased support for children.

**Third sub-hypothesis:** Anger management training influences decreasing individual relationship with own family.

**Table 12: T-test of independent groups to review difference of differential means of two groups (experimental and control) for individual relationship with own family**

Groups	Qty	Mean	Standard deviation	Difference of means	T-ratio	df	Level of significance
Experimental	15	-1.66	4.28	-4.06	2.55	28	0.016
Control	15	2.4	4.43				
Total	30						

Calculated T ( $t=2.55$ ,  $df=28$ ) in error level of 0.05 is significant and with confidence coefficient of 95% the null hypothesis of the research is rejected. So it could be said that anger management training through cognitive-behavioral method was effective in decreasing individual relationship with own family.

**Fourth sub-hypothesis:** Anger management training influences decreasing family relations with spouse's family and friends.

**Table 13: T-test of independent groups to review difference of differential means of two groups (experimental and control) for relationship with spouse's family and friends**

Groups	Qty	Mean	Standard deviation	Difference of means	T-ratio	df	Level of significance
Experimental	15	-1.6	3.26	-2.13	1.70	28	0.1
Control	15	0.53	3.58				
Total	30						

Calculated T ( $t=1.70$ ,  $df=28$ ) in error level of 0.05 is not significant and the null hypothesis of the research is confirmed. So it could be said that anger management training through cognitive-behavioral method had no effect on decreasing family relation with spouse's family and friends.

**Fifth sub-hypothesis:** Anger management training influences increasing financial partnership between spouses.

**Table 14: T-test of independent groups to review difference of differential means of two groups (experimental and control) for financial partnership**

Groups	Qty	Mean	Standard deviation	Difference of means	T-ratio	df	Level of significance
Experimental	15	-1.26	3.1	-1.13	0.65	28	0.518
Control	15	-0.13	5.93				
Total	30						

Calculated T ( $t=0.65$ ,  $df=28$ ) in error level of 0.05 is not significant and null hypothesis of the research is confirmed. So it could be said that anger management training through cognitive-behavioral method had no effect on increasing financial partnership between spouses.

**Sixth sub-hypothesis:** Anger management training influences increasing emotional reactions.

**Table 15: T-test of independent groups to review difference of differential means of two groups (experimental and control) for emotional reactions**

Groups	Qty	Mean	Standard deviation	Difference of means	T-ratio	df	Level of significance
Experimental	15	-5.8	4.05	-7.46	-4.87	28	0.001
Control	15	-1.66	4.32				
Total	30						

Calculated T ( $t=7.46$ ,  $df=28$ ) in error level of 0.05 is significant and with confidence coefficient of 95% the null hypothesis of the research is rejected. So the observed difference between differential means of scores is not stochastic and it could be said that anger management training through cognitive-behavioral method was effective in increasing emotional reactions.

**Seventh sub-hypothesis:** Anger management training influences increasing cooperation between spouses.

**Table 16: T-test of independent groups to review difference of differential means of two groups (experimental and control) for spouses' cooperation**

Groups	Qty	Mean	Standard deviation	Difference of means	T-ratio	df	Level of significance
Experimental	15	-3.73	3.45	-3.93	3.42	28	0.002
Control	15	0.2	2.8				
Total	30						

Calculated T ( $t=3.42$ ,  $df=28$ ) in error level of 0.05 is significant and with confidence coefficient of 95% the null hypothesis of the research is rejected.

## Results interpretation

Markman et.al [14] provided a report for a 5-year review in terms of assessing effect of prevention from marital distress by conflict control training. This assessment included a 5-session program of life skill and conflict control training. Within 5 years follow up in comparing with control group, trained couples showed higher level of positive relation skills and lower negative relation skills and violence.

Lange and Butler et.al [15, 16] reviewed the effect of anger self-management training in dysfunctional couples. They asked 9 couples to write to their spouses rather than express their anger. The results showed remarkable improvement in anger management of couples against each other [6].

Haji Abolzadeh [17] in research under the title of "The effect of relation skills training through cognitive-behavioral procedure on the rate of marital conformity of couples who residing at Karaj city" and concluded that life skills training such as anger management, effective conversation, solving the problems and innovative thinking through cognitive-behavioral method influence conformity rate of couples. They believe that anger management skills are of the most important in this matter.

In a research under the title of "The effects of anger management training on preventing delinquency of children from maladaptive families in Tehran City", anger and violence were mentioned as factors which cause violence and aggression in maladaptive families. This emotion could be trained and control by cognitive-behavioral method which will reduce conflicts among family and children [18, 19].

Finally it is concluded that three hypotheses of support for children, relation with spouse's family and friends and increased financial partnership are not confirmed. Because the research hypotheses have been reviewed as a major hypothesis and seven sub-hypotheses and it was shown that this training was powerful in other sub-hypotheses, it can be concluded that anger management training through cognitive-behavioral procedure influences reducing marital conflicts.

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# Evaluating the impact of discharge nurse activities on the re-hospitalization of premature neonates and mothers' quality of life

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## Abstract

**Introduction:** Appropriate communication between mothers of premature neonates and nurse in the discharge process can have significant impact on enhancing the quality of neonate care after discharge, leading to reduced likelihood of re-hospitalization of premature neonates. Thus, the current research was conducted to evaluate the impact of discharge nurses on re-hospitalization and quality of life of mothers of neonates re-hospitalized in the neonatal intensive care unit.

**Methodology:** The population of the current research consisted of mothers of premature neonates who were re-hospitalized in the intensive care units of the hospital. They were randomly divided into intervention and control groups. All descriptive and inferential data were analyzed in SPSS software.

**Findings:** Research findings revealed that the rate of neonatal re-hospitalization was 35.33 in the control group before intervention, while it was 37.36 in the intervention group. In addition, the mean rate of re-hospitalization after the intervention was 34.33 in the intervention while it was 37.40 in the control group. The mean score of quality of life before and after the intervention in the control group was lower than that in the intervention group.

**Discussion and conclusion:** Using the findings of the current research, nurses should pay much more attention to training of parents at the time of discharge and evaluate the training provided for parents before neonate discharge.

**Key words:** nurse discharge, neonate re-hospitalization, quality of life, preterm neonate

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## Introduction

Human infants are born by completing the embryo development-process within 37 weeks. Sometimes the infant is born sooner than normal. A preterm infant is an infant born at an age less than 37 weeks based on the Last Menstrual Period (LMP) [1]. Among the most important effects on preterm and sick infants' birth is jeopardizing the transition process to the parenting stage, where the mother is more vulnerable due to the important role of the mother being distanced from the infant and its particular conditions [2].

The likelihood of death in preterm infants is very high. In Iran, five thousand infants are born every day, 5 to 15% of whom are preterm [3]. Physiologically, these infants need special care for survival and natural growth process in the neonatal intensive care unit (NICU), lasting from a few days to several months depending on the condition of the infant and its requirements [4]. The lack of awareness of the parents, especially the mother, of the required care for the growth of preterm infants and the discharge of the infant without training the mother can lead to anxiety and concern [5], which accentuates the importance of having a discharge plan.

Discharge process is a plan depending on cooperation, commitment, accountability, and professional competence of the medical staff. Although this decision is primarily made based on the medical status of the infant, many factors including family readiness for discharge, facilities, home-care, and pressure from hospital costs affect it [6]. The central focus of providing the discharge plan is the discharge nurse, who coordinates team members and is responsible for referring and following up different aspects of patient care [7]. Especially in the neonatal unit, this discharge is very effective in treatment and the interaction with parents in the discharge process, and following up the physiological growth of the preterm infant [8]. By combined review of the published articles regarding the discharge of preterm infants from NICU, Lopez et al. (2012) figured out that interventions regarding parental awareness from the beginning of admission until discharge would reduce the length of hospitalization of preterm infants [9]. Researchers believed that empowerment of parents would improve their mental condition and may have an impact on child readmission.

Readmission is unplanned re-admitting to NICU lasting for at least one night. The probability of readmission in preterm infants is higher compared to other infants [4]. Dashti et al. (2014) studied 245 preterm infants admitted to NICU in three educational hospitals of Shahid Beheshti University of Medical Sciences through convenience sampling aimed at identifying the factors associated with readmission in NICU. Findings suggested a significant difference in discharge-readiness score between re-admitted infants and those not experiencing this ( $p < 0.001$ ) [6]. Readmission is one of the main challenges of the health system as besides increasing treatment cost, it reduces the quality of life by increasing parental concerns [10]. This is because

they may feel helpless, guilty, and horrified regarding survival or long-term effects of illness on the child. Thus, parental quality of life is heavily influenced (Rasti et al., 2013). Reduction in parental quality of life can cause many problems in recovery of the infant [11].

Quality of life is a multi-dimensional concept whose components are physical, mental, psychological, social and spiritual performance of the individual, and different conditions, such as the individual's economic and personal circumstances affect it. Overall, it means a sense of satisfaction with life [12]. Measuring the quality of life and considering life conditions, environmental factors, and attitudes, and interests, goals of individuals and values of society is very important for nurses in planning health promotion [13].

The findings of Abdolalizadeh and Kermanshahi (2014) - who evaluated the effect of health-promotion support program (HPSP) on the quality of life of mothers of preterm infants - indicated that HPSP is effective on the quality of life of mothers of preterm infants, so its application is recommended for improving the quality of life of mothers [14]. The results of other studies have indicated a significant difference in the level of awareness among mothers of infants with readmission and those without readmission. Thus, by planning for the discharge process, in addition to behavioral changes in the family, one can make savings in extra costs and reduce the heavy economic burden on the patient's family [6,15].

Thus, this study examined the effect of discharge nurse activities on the readmission of preterm infants admitted to NICU as well as the quality of life of the mothers of these infants.

## Methodology

The study was semi-experimental. The sampling, which was conducted from late October to mid-January 2016-2017, consisted of 50 mothers of preterm infants admitted to NICUs of selected hospitals of Alborz University of Medical Sciences. The samples were selected purposively considering inclusion criteria such as mothers having physical and mental health, ability to read and write, infant being the first child, and the absence of a serious health problem, such as congenital anomalies in the infant. They were divided into intervention and control groups in the two selected hospitals of the medical university (Kamali and Bahonar) and were randomly assigned to the group. After explaining the goals and obtaining informed and written consent, according to the same policy of the Alborz University of Medical Sciences regarding discharge and admission in NICUs, the mothers of the intervention group were selected from Kamali Hospital and mothers of the control group from Bahonar Hospital. The mothers of the intervention group received the necessary education from the discharge nurse during the period of hospitalization in 6 sessions based on the study of Moghadam et al. (2014). Mothers of the control group received only regular training and routine programs [16].

Exclusion criteria were 1) refusing to complete the questionnaires, 2) incomplete questionnaires, 3) the occurrence of any serious disorder in the health of the infant or mother, and 4) transferring the infant to other treatment centers.

The data collection tool included two questionnaires and a checklist. The questionnaire of the demographic characteristics of the infant and parents included the age of the infant, birth weight, infant gender, multifetal incidence, length of hospitalization, mother's age and fixed and mobile phone numbers for contacting parents to ensure re-admission or lack of it. The World Health Organization Quality of Life (WHOQOL) questionnaire had 26 items in terms of physical, psychological, social and environmental health. The infant care checklist contained 30 titles regarding the conditions for keeping and maintaining the infant's health. Content validity was evaluated by the faculty members of the university, supervisor, and advisors to determine the validity of the demographic questionnaire. Concerning the content validity of the checklists, it was approved by faculty members, nurses of NICU, and neonatal specialist with a coefficient of 0.94.

Content validity and face validity were used to determine the validity of WHOQOL. Concurrent validity was used to determine the validity of the scale, and the relationship between the total score of the test and its subscales was assessed with the total score and subscales of the general health questionnaire through correlation coefficient. For determining the validity, the correlation of the overall score of each dimension was used with each of the questions forming that dimension. The correlation coefficients range was obtained from 0.45 to 0.83 with all coefficients being significant at level of 0.01. Each item had the most correlation with its related dimension. Then 12 professors of faculty, nursing faculty members, and infant specialists examined and judged the contents of the questions regarding relevance, clarity, and simplicity and the comments were added to the list after conclusion.

Content validity was evaluated and confirmed by calculating the ratio and content validity index based on the viewpoint of 15 faculty members of the Faculty of Nursing and Midwifery and Neonatal Specialists [17]. According to the study by Moghadam et al. [16], inter-rater coefficient was used to determine the reliability of the infant's home care checklist. The researcher and rater, who were similar in terms of accuracy and knowledge, completed the checklist simultaneously, and knowledge and awareness were simultaneously completed for 10 observations. Then, the intra-class correlation coefficient (ICC) was calculated between the results obtained from observations of the two observers. ICC was calculated as 0.98, and given that numbers above 0.75 are acceptable [18], the reliability of the checklist was confirmed. Face validity was based on the views of 10 mothers who had the criteria for entering the study.

Mothers were invited to participate in the training sessions organized in person in NICU in mothers' training unit to intervene. The classes were held in general twice a week,

on Saturdays and Wednesdays, for 30 minutes, of which the first five minutes was familiarization and problem statement, 15 minutes explanation of the subjects and the last 10 minutes were for questions and answers. All the stages of the training class were filmed, so that if a mother did not have the opportunity to attend the class, she could use the video. The mothers of the control group were given some descriptions on the importance of conducting the research and asked to collaborate in the progress of the research. Educational materials like how to properly get the infant to sleep and how to properly breastfeed were trained through role play. The researcher gave some explanations on being pre-term and appropriate care for passing through this course, including lactation, how to replace diapers, skin care and bathing for the infant, identifying risk symptoms and post-discharge follow-ups, including vaccinations, how to improve the quality of maternal health, sleep, nutrition, exercise, control of mental conditions and self-care for the family.

Furthermore, a booklet containing all the teaching materials along with the appropriate educational pamphlets, were distributed among them. Routine training was provided to mothers in the control group. During the discharge, the information of the mothers in the intervention and control groups was assessed using the checklist for discharge and WHOQOL. Readmission of the infants was pursued after four weeks in the presence of the mothers in the hospital and, otherwise by telephone. The role of discharge nurse in readmission of infants and mothers' quality of life in both intervention and control groups were compared and statistically analyzed. At the beginning of admission and four weeks after admission, mothers' information in the intervention and the control groups was obtained using demographic questionnaire and WHOQOL. Readmission of the infants and mothers' quality of life were followed by telephone over a period of four weeks. The role of the activities of the discharge nurse in readmission of infants and quality of life of mothers in both intervention and control groups were compared and statistically analyzed.

Data were analyzed by SPSS20 and parametric and non-parametric statistical tests. In data analysis, 95% confidence level and p-value less than 5% were considered to study the significance of the relationship between variables.

## Results

In this study, the majority of infants were boys (54%) and 40% had a history of admission from 1 to 15 days. Table 1 shows some of the demographic variables. The level of knowledge of mothers after intervention was significantly different in the two groups. Table 2 shows this value. Moreover, there was a significant difference between the mean and the rate of hospitalization in intervention and control groups. Table 3 shows this difference. Mean score of quality of life before and after the intervention in the control group was less than the mean score of this variable in the intervention group, but with no statistically significant differences. Table 4 shows the quality of life in both groups before and after intervention.

Table 1: Frequency distribution of demographic variables

Variable		Frequency	Frequency percent
Gestational age (week)	26-27	19	38
	28-29	17	34
	30 - 31	14	28
Weight of infants (g)	600-800	10	20
	900-1100	26	52
	1200-1300	14	28
Gender	Boy	27	54
	Girl	23	46
Admission time (day)	1-15	20	40
	16-30	5	10
	31-45	10	20
	46 and more	15	30
The age of infants' mothers	Less than 20	3	6
	21 to 25 years old	12	24
	26 to 30 years old	29	58
	More than 31	6	12

Table 2: Comparison of the mean of knowledge of mothers in intervention and control groups after activities of discharge nurse

Variable	Control group	Intervention group	T test	Sig.
Knowledge of mothers after activities of discharge nurse	30.33	36.37	2.87	0.03

Table 3: The average readmission of preterm infants after activities of discharge nurse

Variable	Class	Group	Mean	SD	T test	Sig.
The average infant readmission	After intervention	Intervention	34.35	8.90	1.25	0.04
		Control	37.40	6.54		

Table 4: Mean of quality of life of mothers of preterm infants before and after activities of discharge nurse in intervention and control groups

Quality of life of infant family		Mean	SD	T test	Sig.
Intervention	Before the intervention	95.15	20.29	1.251	0.65
	After the intervention	98.18	25.58	0.985	0.89
Control	Before the intervention	89.28	13.15	1.251	0.65
	After the intervention	95.85	17.18	0.985	0.89

## Discussion

The results indicated that 46% of the infants were girls and 54% boys. Some other studies have shown that most preterm infants in NICUs are boys. Perhaps this shows the vulnerability of male sex during infancy and them requiring more intense care [19].

According to the results, there was a significant difference in the level of mother's knowledge about the status of the infant after intervention, which increased after intervention. The goal of training was to enhance and improve knowledge.

The average rate of readmission of the infants after the intervention was reduced compared to before the intervention. Considering this, the results of the studies suggest that due to bearing the infant's preterm the shock and the physical condition of the mother, it is likely that the mother's preparation for taking care of her preterm infant is not sufficient. The care for the preterm infant, with a particular physiological condition, the delayed growth process, and aggravating factors in the lack of special needs of preterm infants have led to ineffectiveness in maternity, so the likelihood of returning and readmission to the NICU is much higher than that of normal infants [20]. According to Ambalavanan et al. (2011), more than 45% of the preterm infants with high weight deficiency in the United States need readmission, as preterm infants need parents' care at home after discharge from NICU and in

case of lack of mother's ability to take care of their children readmission occurs [4]. Thus, readmission of preterm infants is one of the major challenges that increase the length of hospitalization and infant mortality, the parents' anxiety, and the costs of the health system [10].

Given the studies conducted, the results indicated that the average quality of life of mothers before the intervention was less, but there was no significant difference between control and intervention groups. Many studies have shown that the effects of stress on the birth of a preterm infant have had a long negative effect on the quality of life of parents, especially the mother [21]. Quality of life is a multidimensional concept including all the physical, mental, social, and spiritual functions of an individual and in a sense of satisfaction with life [12].

## Conclusion

The results of this study showed the importance of education in reducing the probability of readmission of preterm infants after discharge from NICU and improving the quality of life of mothers. Therefore, nurses as one of the most important individuals in the treatment team and the discharge nurse as team coordinator responsible for referring different dimensions of patient care and follow up, play an important role in this regard. It is recommended that preterm infants' fathers and mothers' quality of life after the activities of discharge nurse be measured and compared. Among the limitations of this study were the difference in admission criteria and the threshold for readmission (the minimum requirements for the readmission of the infant). Hospital differences in terms of admitting and discharge criteria can be effective in readmission of infants. Hospitals with mild or strict admission criteria may have different levels of readmission. This criterion and conditions may vary between centers or even within the centers by the admitting physicians.

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# Evaluation of Malnutrition Status in Patients admitted to Shahid Rajaei Hospital in Gachsaran City in 2016

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## Abstract

**Introduction:** Malnutrition is an acute or chronic nutritional status resulting from an imbalance in the intake that is associated with overdose and inadequate intake, leading to changes in the composition or reduced function of the body. Bio-social conditions, and acute and chronic diseases are the most important factors affecting nutrition and can cause malnutrition. Knowing the prevalence and severity of malnutrition in hospitalized patients can be used by managers to understand the causes, health care needs and health plans.

**Method:** In this descriptive cross-sectional study, the samples were selected as unpredictable and objective based on the population of patients admitted to all departments of ShahidRajaei Hospital in Gachsaran during three months. For each patient, forms containing demographic data, anthropometric indices (weight using a patient's scales), height (use of patient records or non-elastic meter, or ulnar bone length), BMI (weight divided by squared of the Height), the Mid-Arm Circumference(MAC) (in meters), waist circumference (in meters), skin thickness of the triceps muscle (with caliper) and the amount of fatty muscle (using the formula), and the assessment form for all Individual Subjective Global Assessment(SGA) was completed by project implementers (Nutrition Experts). Data were analyzed using SPSS 19 software and descriptive statistics, charts, combined tables and Chi2 test were used.

**Findings:** Of the 600 patients (306 were women and 294 men) with a mean age of  $19 \pm 47.9$  and an average BMI of  $5.1 \pm 25.0$ , the data were collected from the study population. The subjects were classified into 14 groups according to the main diagnosis. The

prevalence of malnutrition (underweight, overweight and obesity) was 49.3% in the hospitalized patients with the BMI index and the findings as follows: low prevalence 6.6% (mild 4.3%, moderate 1.0% and severe 1.3 %), the prevalence of overweight and obesity was 42.8% (overweight 26.2%, obesity 16.6% (mild obesity 12.2%, moderate obesity 3.2% and severe obesity 1.2%)). Therefore, it was found that the prevalence of obesity and overweight in these patients was approximately 6.5 times more than underweight. The malnutrition outbreak rate was 29.2% by using the SGA tool and was as follows: 425 people have good nutrition or no malnutrition (70.8%), 138 patients with mild to moderate malnutrition (23.0 %) and 37 patients with severe malnutrition (6.2%). Also among 575 patients, 289 had an acute illness and 286 had chronic illness. 12.5% suffered from malnutrition and acute illness (75 cases) and 15.2% suffered from malnutrition and chronic disease (91 cases). 1.5% of the subjects were malnourished and in the group of both diseases.

**Conclusion:** In this study, the prevalence of malnutrition was estimated to be 29.2%, with an index of body mass index of 49.3%, and it was found that overweight and obesity malnutrition among hospitalized patients was much higher than malnutrition due to Lack of weight in the hospital of this city. It was also found that nutrition assessment was not conducted in hospital patients except in special cases. Therefore, considering that hospitalization time can provide an opportunity to identify malnutrition in vulnerable patients, it is suggested that by assessing the nutritional status of patients, at least when they arrive at the provincial hospitals, appropriate nutritional support in malnourished patients, nutritional deficiencies and educational interventions and counseling for

Overweight and obesity malnourished patients and chronic illnesses associated with health professionals and nutrition experts and nutritionists should be taken into account.

**Key words:** malnutrition, Gachsaran City, Iran

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## Introduction

Malnutrition is an acute or chronic nutritional status resulting from an imbalance in receptivity that occurs in two situations, such as those found in developed societies and the lack of information that is often found in developing countries and hospitals, leading to changes in the composition or loss of function of the body (1-3).

Bio-social condition, acute and chronic diseases are some of the most important factors affecting nutrition and can cause malnutrition. Among the diseases that cause malnutrition can be chronic diseases such as cancer, kidney failure, chronic liver disease, chronic obstructive pulmonary disease, cardiovascular disease and acute illnesses such as burns, infections, and trauma (5). Food screening as early as possible in early childhood nutritional care allows early intervention and ease of treatment, but often doctors and nurses do not have enough time and information to calculate nutrition status indicators and screening; therefore, programming for the nutritional status of children and their nutritional needs in the hospital can be effective in reducing the prevalence of malnutrition (1,3,5,6).

In routine screening and appropriate nutrition support, some of the most trusted tools, are SGA, Mini Nutritional Assessment (MNA), Malnutrition Universal Screening Tool (MUST) (1, 7). The methodology and tools used by the researchers can provide different results from the epidemiology of malnutrition in hospitalized patients (3, 8). So far, studies have reported the prevalence of malnutrition in hospitalized patients between 20% and 50%, and in some parts of Iran's hospitals, malnutrition rates are reported to be around 45 %. However, there are no accurate data on the prevalence of malnutrition in Iranian patients. Regarding the severity of malnutrition, in a study in Ayatollah Taleghani Hospital in Tehran, mild malnutrition was reported as 14%, moderate 10%, and severe as 28% (3, 9-17).

Pirlich et al. (2006) conducted a study titled "German hospital malnutrition study". The nutritional status was assessed by SGA and measured by anthropometric indices such as weight, BMI, MAUC (Mid-Upper Arm Circumference), and triceps skin with caliper, AMA (arm muscle area) and AFA (area fat arm) In 1886, admitted patients were evaluated in 13 hospitals. Malnutrition according to SGA was found in 27.4% of patients. The low AMA was 11.3% and the low AFA was 17.1%.

43% of patients were 70 years of age compared with only 7.8% of patients under 30 years with malnutrition. The highest prevalence of malnutrition was in the elderly (56.2%), cancer (37.6%), gastrointestinal (32.6%). The result is that in hospitals in Germany, out of every four, one person has malnutrition and malnutrition is associated with an increase in length of stay in the hospital (18).

A descriptive study was conducted by Hosseinpour Niazi et al. In 2011 with the title and purpose of studying breastfeeding in Iran, 446 admitted patients had Body Mass Index (BMI), Triceps Skinfold (TSF), and Mid-Arm Muscle Circumference (MAMC) measured. According to the results of nutritional studies in the hospital, Ayatollah Taleghani Tehran, (52%) had mild, moderate and severe in order of 14%, 10% and 28% respectively. The highest prevalence of malnutrition was in the gastrointestinal tract (64%). In the malnourished group, the prevalence of MAMC, MAC, and TSF was significantly less than 5 times, more than that of adequate nutrition. Increasing the body mass reduced the likelihood of malnutrition by 17% (3). Considering that knowledge about the prevalence and severity of malnutrition in hospitalized patients can be considered in this plan for the purpose of knowing its causes, health care needs to include planning health services, and managing this problem by the managers. Anthropometric indicators individual assessment tool (SGA), which assesses the latest incidence of deficits and over-nutritional benefits that appear in clinical practice and physics needs to be used. Regarding the status of nutrition, the status of malnutrition and its severity in patients admitted to the hospital of Shahid Rajaei, Gachsaran, we did not find a study on the prevalence of malnutrition in patients admitted to hospitals in the province, to achieve these goals. It should be noted that the purpose of this project is not to assess the prevalence of malnutrition caused by hospitalization, but also to determine the status of malnutrition in hospitalized patients, mainly due to the underlying condition of the individual and the initial course of the illness or bio-social condition of a person.

## Materials and methods

A cross-sectional descriptive study was conducted. Sample collection was performed in all three cohorts of all patients referring to Shahid Rajaei Hospital in Gachsaran, who entered the study in a three-month period and the number of samples reached over 554 (600).

For each patient, forms of demographic information, anthropometric indices, and individualized assessment (SGA) were completed by project implementers (nutrition experts). In this plan, two different tools were used to examine malnutrition. One SGA form and one anthropometric index. The SGA form determined most downstream patients with malnutrition such as atrophy, weight loss, cachexia, marasmus, and more. But the second instrument, the anthropometric indices, showed both malnutrition and weight gain and obesity. In patients with a SGA form in the malnourished group (A), there may have been overweight malnutrition, in which case anthropometric indices such as body mass index, waist circumference and the amount of fat and muscle mass was reported for overweight malnutrition.

In order to minimize the measurement changes, all project executives were measured by a trained specialist and the indicators for each patient were measured twice by the two administrators.

Different definitions of malnutrition and proportional to them, there were various indicators for measuring malnutrition that were used in this design.

**Subjective Global Assessment:** Designed by Detsky and colleagues. Based on the physical symptoms of malnutrition (loss of subcutaneous fat or muscle mass, edema, ascites), history of weight loss, dietary intake, gastrointestinal symptoms, functional capacity and diseases, and their relationship with nutritional needs (18, 20).

Each patient with SGA was placed in one of the following three groups:

**SGA A:** Proper nutrition or malnutrition

**SGA B:** Mild to moderate malnutrition

**SGA C:** Severe malnutrition

Validation of SGA to identify malnutrition and its consequences have been considered in several studies (22-20).

#### **Anthropometric Indicators:**

Weight (with a SGA scale or use of patient records), height (use of patient records, instrumental meter or bone marrow length), BMI (weight divided by height squared), middle arm (MAC) (with non-elastic meter instrument from arm Non-volatile person), waist circumference (with non-elastic meter instrumentation), thickness of the skin of the triceps muscle (TSF) (using a caliper tool between the acromion tip and the non-volatile olecranon appendage), the fat arm area (AFA) and muscle area (AMA) were calculated using the following formulas (23):

$$AA = (3.14 \div 4) \times (MAC \div 3.14)^2$$

$$AMA = ((MAC - 3.14 \times TSF)^2) \div (4 \times 3.14)$$

$$AFA = AA - AMA$$

Patients with AMA or AFA below the 10th percentile were considered to be malnourished according to Frisancho's tables. Although one of the limitations of this method is

that patients with severe changes in body composition and hydration may not be identified (18, 23).

## Findings

In this study, 600 patients with inclusion criteria were sampled with informed consent from the patient or their companion. Information obtained from patients for reason of admission were as the Table opposite:

Considering that the patient could have multiple diseases at the same time, according to the designer's view, the most important disease of the person that could affect their nutritional status was considered as the main diagnosis. The main diagnosis of patients was classified into 14 generic groups. Some groups have several different diseases, for example, a group of autoimmune diseases included lupus, scleroderma, multiple sclerosis, rheumatoid arthritis and type 1 diabetes, and infectious diseases included pneumonia, urinary tract infections, wound infections and other cases.

Different information is obtained from the table above. In this table, different groups are classified according to the number of people in each group from top to bottom (from high to low). The highest number of hospitalized patients was due to surgery (156) and the lowest rate was for burns (12). The highest mean age group was in patients with chronic renal failure ( $19.1 \pm 63.2$ ) and the lowest mean age group was in patients with thalassemia major ( $4.1 \pm 24.8$ ). In the sex, the number of women and men with each disease is presented separately.

Among the patients in different groups, the highest mean BMI was found in patients with metabolic diseases ( $5.3 \pm 28.4$ ) and the least of them was in patients with thalassemia major ( $3.1 \pm 20.6$ ). Therefore, the added importance of weight and obesity are known to cause chronic diseases such as diabetes, high blood pressure, abnormal lipids and fatty liver.

The prevalence of malnutrition in general (underweight, overweight and obesity) was calculated as 49.3% in patients admitted using BMI.

The underweight prevalence was 6.6%, which was divided into 3 groups.

The prevalence of mild weight loss ( $17.0 \leq \text{BMI} \leq 18.49$ ) was 4.3%, moderate weight loss ( $16.0 \leq \text{BMI} \leq 16.99$ ) was 1%, and severe prevalence of weight loss ( $\text{BMI} < 16$ ) was 1.3%.

The prevalence of overweight and obesity was 42.8%, which is divided into 4 groups.

The prevalence of overweight ( $25.0 \leq \text{BMI} \leq 29.99$ ) was 26.2% and the prevalence of obesity in general ( $30.0 \leq \text{BMI}$ ) was 16.6%. The prevalence of class 1 or mild obesity ( $30.0 \leq \text{BMI} \leq 34.99$ ) was 12.2%, the prevalence of class 2 or moderate obesity ( $35.0 \leq \text{BMI} \leq 39.99$ ) and 3.2%, and prevalence of grade 3 or severe obesity ( $40.0 \leq \text{BMI}$ ) was 1.2%.

Table

The main diagnosis	n	AGE	SEX	BMI (Kg/m <sup>2</sup> )	Malnutrition (SGA B+C) outbreaks
Surgery	156	42.6 ± 16.7	75 / 81	26.1 ± 4.8	18.6%
Metabolic disorders (type 2 diabetes, high blood pressure, blood lipids, fatty liver)	75	55.5 ± 13.7	24 / 51	28.4 ± 5.3	13.3%
Renal Failure (ESRD) (hemodialysis)	54	54.3 ± 15.9	31 / 23	24.2 ± 4.9	27.8%
Bacterial infections	54	50.2 ± 19.4	26 / 28	23.9 ± 4.7	27.8%
Thalassemia	50	24.8 ± 4.1	18 / 32	20.6 ± 3.1	24.0%
Traumatic injury	42	41.0 ± 16.8	32 / 10	23.9 ± 4.6	35.7%
Respiratory disorders (asthma, COPD)	27	57.4 ± 21.3	16 / 11	25.1 ± 6.0	37.0%
Neurological diseases	25	55.3 ± 21.5	10 / 15	25.7 ± 4.9	48.0%
Cancers	21	60.9 ± 16.8	10 / 11	21.5 ± 5.1	100%
Cardiovascular disease	20	61.7 ± 15.6	8 / 12	26.7 ± 5.7	35.0%
Autoimmune diseases	20	44.2 ± 15.3	7 / 13	26.1 ± 4.4	25.0%
Chronic Kidney Failure (CKD)	19	63.2 ± 19.1	10 / 9	24.2 ± 3.6	57.9%
Burn	12	44.2 ± 15.1	9 / 3	24.1 ± 3.5	33.3%
Others	25	50.2 ± 21.5	18 / 7	24.6 ± 4.2	36.0%
Total	600	47.9 ± 19.0	294 / 306	25.0 ± 5.1	29.2%

As it is known, the prevalence of obesity and overweight in these patients was approximately 6.5 times higher than the prevalence of underweight.

#### Nutrition Status and Main Diagnosis:

The highest prevalence of malnutrition with SGA instrument in the different groups of primary diagnosis was as follows (Figures - next page):

Cancer category> Chronic kidney failure> Neurological diseases> Respiratory diseases (COPD and asthma)> Traumatic injury> Cardiovascular disease> Burn> Infectious diseases> Hemodialysis (ESRD)> Autoimmune diseases> Thalassemia major> Surgery > Metabolic diseases .

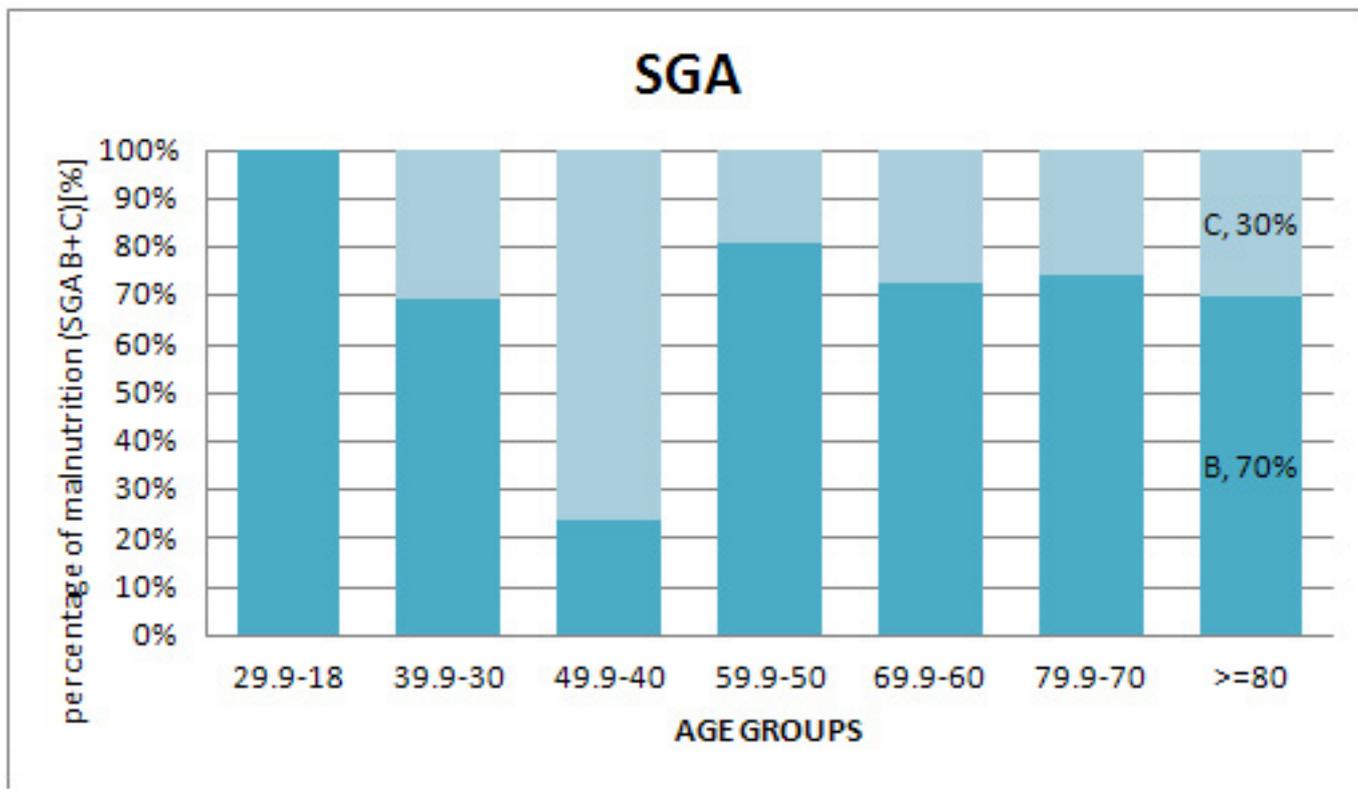
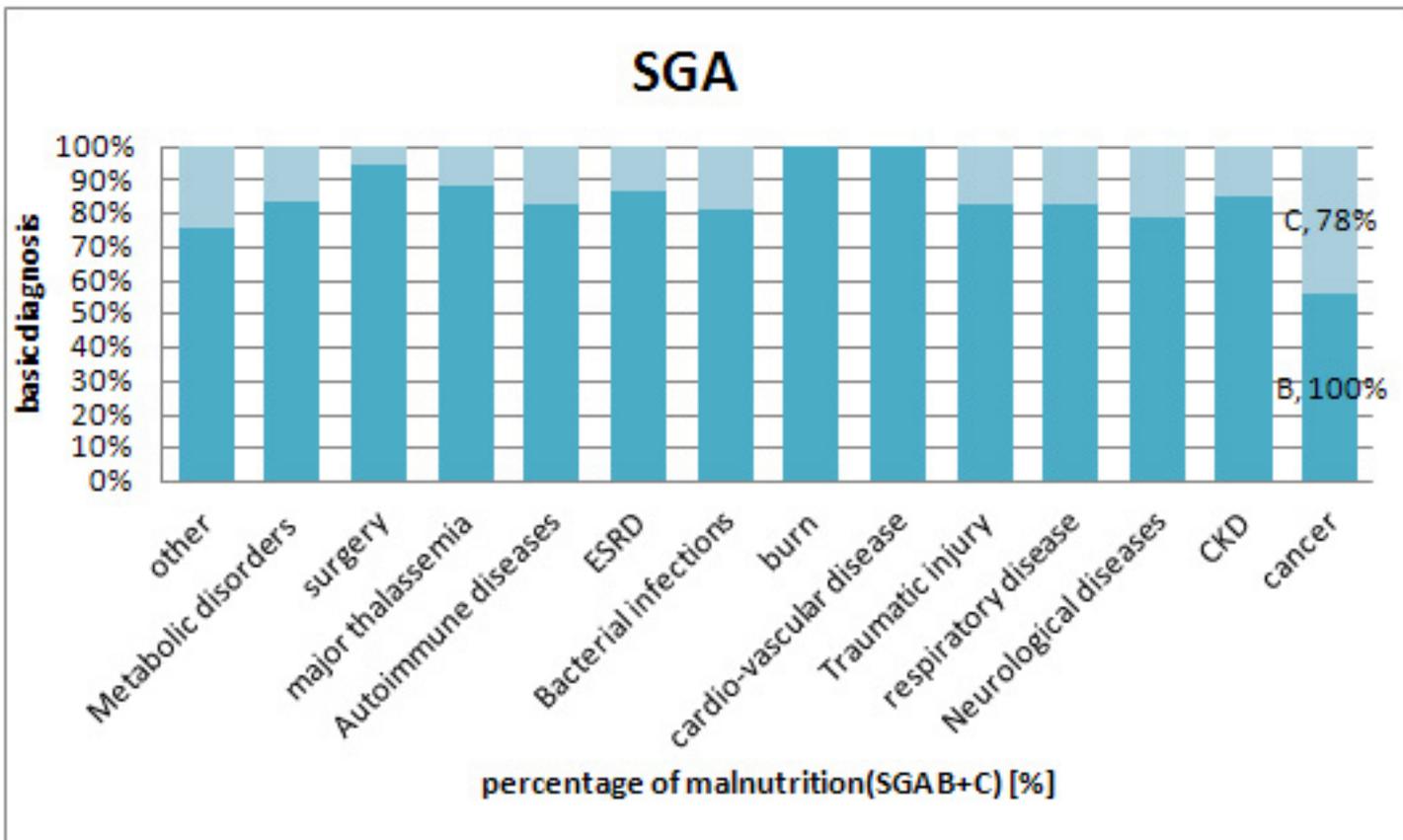
Relationship between nutrition status and age and gender:

Using Independent t-test, there was a significant increase in the overall malnutrition outcomes (SGA B + C) with increasing age, with a significant decrease in malnutrition with F = 18.623 and df = 273.285 (p <0.05).

In addition, using Independent t-test between the small age variable and the two groups SGA B and SGA C from the full-scale individual assessment variable, with F = 7.385 and df = 70.554, the severity of malnutrition increased with age (P < 0.05).

For example, in the age group of over 80, over 60% of all patients with malnutrition and over 20% had severe malnutrition (SGA C).

Chi2 test was performed between two variables grouped by sex and having or not having malnutrition, the number of men with malnutrition (105, 35.7%) was significantly higher than women with malnutrition (70, 22.9%), and this difference was significant (P <0.050).



## Discussion and Conclusion

In this study, we evaluated the nutritional status of 600 patients hospitalized in Shahid Rajaei hospital in Gachsaran city with a wide range of diseases and hospitalization causes. Different tools were used to evaluate the nutritional status of patients, with different results.

In past studies, the prevalence of malnutrition has been reported in hospitals both overseas and in different cities of Iran. Some of these studies have examined the prevalence of malnutrition in all parts of the hospital (35, 3, 7, 18, 24, 25) and some have studied some of the malnutrition in specific areas or in specific patients (18, 20, 23, 32, 33). Some of the statistical results given in these studies are similar and some are different. Due to differences in the prevalence of malnutrition in patients, it is possible to use different definitions for malnutrition as well as the use of different diagnostic tools for malnutrition and a variety of different diseases (3, 8, 18). For example, in a study of 155 patients, there were 4 different malnutrition categories, due to differences in the use of various diagnostic tools (28).

In our study, a comprehensive self-assessment tool (SGA) was used to assess nutritional status. This tool is based on the physical symptoms of malnutrition (loss of subcutaneous fat or muscle mass, edema, ascites), history of weight loss, dietary intake, digestive tract symptoms, functional capacity, and diseases, and their association with Nutritional needs assess the nutritional status of patients, and is an efficient, fast, and reliable tool for assessing nutritional status and has high predictive power in clinical settings and age groups. Therefore, E.S.P.E.N clinical guidelines suggest regular use to detect malnutrition in hospitalized patients (18, 20, 21, 29).

In our study, according to this tool, 70.8% of the patients had a good nutritional status and the prevalence of malnutrition was 29.2%, of which 23% had mild to moderate malnutrition and 6.2% had severe malnutrition.

It was also found that the most malnutrition was in cancer patients, all of whom had malnutrition and over 70% had severe malnutrition. While in the evaluation of nutritional status in 416 patients with cancer in Tehran, by Khoshnevis and his colleagues, the prevalence of malnutrition was 53% by using the PG-SGA tool (33). In a study by Movahed and his colleagues using MUST, 48.8% of the cancer patients were at low risk and 12.56% were at risk of malnutrition and 38.5% of them were seriously endangered (19).

Assessment of Nutrition in Pirlich et al's study in patients hospitalized in German hospitals using the SGA tool, they estimated the prevalence of malnutrition was 27.4% and the highest malnutrition was reported in the elderly and cancer patients (19). In the study of Fuad al-Dini and colleagues in adult patients admitted to Birjand hospitals, the prevalence of malnutrition was 58.8% using MUST in these patients (3).

Another tool used in our study to assess malnutrition was the BMI index. For example, the BMI index and its classifications, based on the WHO criteria, estimated the overall malnutrition outcomes of both underweight and overweight and obesity to be 49.3%. Of this amount, the prevalence was 6.6%, weight gain 26.2%, and obesity 16.6%. As a result, it was found that the prevalence of malnutrition due to overweight and obesity was 6.5 times the prevalence of malnutrition.

According to this index, the highest levels of malnutrition are overweight and obesity in the group of patients with metabolic diseases such as type 2 diabetes, high blood pressure, fatty blood and fatty liver, and then in the group of patients with cardiovascular disease. On the other hand, the prevalence of malnutrition due to weight loss was in patients with thalassemia major and then in cancer patients, respectively.

For example, in a study by Pirlich and colleagues, malnutrition was found to be underweight in 4.1% of patients and malnutrition due to overweight in 36.5% and Obesity malnutrition was reported in 15.4% of patients (19). Hosseinpour Niyazi and colleagues at Ayatollah Taleghani Hospital in Tehran determined the prevalence of malnutrition in hospitalized patients with BMI and arm circumference and skin thickness of 52%, with the highest prevalence of malnutrition in the gastrointestinal tract (35). In a study done by Rasmussen and colleagues in Danish hospitals using the BMI and dietary intake and weight loss survey, it was found that 39.9% of patients were malnourished and had the highest incidence was in patients of gastrointestinal surgery (24).

Another outcome of the plan was the relationship between aging and the prevalence of malnutrition. In many studies, aging has been introduced as a very powerful factor in malnutrition and suggests that adolescent patients are prone to nutritional deficiencies (3, 30, 31). In our study, as the age increased, the overall prevalence of malnutrition increased, and the severity of malnutrition increased. For example, in the study with SGA, the highest prevalence of malnutrition in people over 80 years old (was more than 60%) and the prevalence of severe infections in these individuals was more than 20%. Various reasons have been made in various studies for the prevalence of malnutrition in the elderly: the underlying diseases such as infection and depression disorders and the problems of biting in the elderly have been noted as factors, as well as nutritional deficiencies caused by the physical and economic characteristics of these people who were not able to access necessary food items (3, 32-34).

Also, in our study on gender and malnutrition, the highest prevalence of malnutrition was seen in male sex, which was similar to that of Fuad al-Dini and Hosseinpour Niyazi and contradicted by Pirlich's study findings (35, 4, 18).

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# Evaluating Relationship between the Implementation of Healthcare Reform and Patient Satisfaction in Health Care Centers of Yasuj

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## Abstract

**Background:** Health risk factors are constantly changing and especially currently we are experiencing rapid changes. In response to this situation the priority is the most important changes that are required to transform and upgrade the health system. This study was designed to investigate the relationship between the executive and healthcare reform plan and the satisfaction of patients and of Yasuj hospitals.

**Methods:** This was a descriptive-correlational study which was conducted in 2015-2016 on patients referred to hospitals and medical training in Yasuj. Morgan table was used to determine the sample size of 381 individuals selected as the sample. To collect data, a questionnaire was used. Internal reliability was .78 for health and satisfaction questionnaire and development plan was .85 respectively. Calculation of the questionnaire's results were done using software SPSS 20 and were then prepared, analyzed and grouped. In order to analyze the data, descriptive and inferential statistics (correlation and regression) were used.

**Results:** There was a significant relationship between implementation of healthcare reform in terms of different dimensions (physical dimensions Hospital, responsiveness, assurance, reliability, empathy) and satisfaction of patients referred to the teaching hospital in Yasuj.

**Conclusion:** Healthcare managers need to equip hospitals and centers for up to date machinery and Health equipment and adequate and appropriate funds in this area, to allow the doctors and hospital staff to increase their activities and provide an increased level of patient satisfaction.

**Key words:** Satisfaction, healthcare reform plan, sympathy, comfort, reliability, tangible

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## Introduction

The health sector is one of the main sectors of the country's economy, and is regarded as infrastructure in the process of economic development, so that most countries are paying special attention to this sector. Maintenance, improvement and promotion of health services are one of the requirements of society and health care is one of the developmental indicators of countries.

Parasurman (2000) defines the perceived quality as a customer's judgment of superiority with the overall advantage of an object, and generally the quality of service literature is conceptualized on the basis of perceived quality of service. (4).

Oliver says that service organizations increasingly use customer satisfaction as a basis for quality measurement, because customer satisfaction is required for global competition. Quality in service can be defined as an indicator of satisfaction (8). Increasing advances in medical sciences, as well as increasing customer awareness and expectations, have turned health service providers into competitive environments (9). Therefore, these organizations view their development and improvement as well as the cost of their development and continuity, and proper development will not be possible except by satisfying customers (6).

Patient satisfaction is a complex set of factors. To achieve patient satisfaction, several dimensions of services, such as nursing care, medical care, support, and various organizational units, are in a way coordinated with each other and with full compliance. respects provide Suitable conditions should create and provide for and promote patients' rights in all respects (10).

The importance of the issue of satisfaction in the provision of health services is increasing as the experience of disease and the necessity of adherence to and follow up of the treatment and care process increase the vulnerability of patients and increase their need for more universal support. However, changing social conditions, along with the promotion of public awareness in recent years, has exacerbated patients' expectations for receiving services (3). According to Gregens et al., patient satisfaction can be interpreted in such a way that patients during the admission not only receive the necessary care and treatment but also are satisfied with the existing conditions and services provided by the staff and the whole system and are willing to return to the center if necessary, and further, to recommend referral to the center (5).

Sarani (3) studied the effect of postal service quality on satisfaction of citizens of Zahedan. The results showed that there is a significant relationship between quality of service and satisfaction, of which the correlation coefficient is 443. (3).

Jabraeli et al., in a study entitled "Survey of Patients' Satisfaction with Quality of Services Provided in Urmia University of Medical Sciences' Educational Centers",

achieved the most results in the five dimensions of response quality (0.70). The results of the statistical test showed that, apart from the scope in the other dimensions of quality, the gap between expectation and perception of patients is significant (1).

Julia et al. obtained the results of a study titled "Patient Satisfaction Survey of Nursing Services Provided in Educational Centers". Most of the patients (72%) said they were provided with satisfactory nursing services. Satisfaction with the two variables of "hospital" and "type of department" was statistically significant. Among demographic variables, only the level of education of patients with their satisfaction from nursing services was statistically significant (2).

In a study on quality of bank services customer satisfaction and loyalty in the Ethiopian banking sector, by Shanka et al (2012) (11), correlation results indicated that there is a positive relationship between the dimensions of service quality and customer satisfaction. The results of the regression test showed that the quality of the service had a positive effect on the overall customer satisfaction. The findings of this research also show that the increase in the quality of customer satisfaction services, in turn leads to a high level of customer commitment and loyalty (11).

Mosahab et al. (2010), conducted a study entitled Quality of Service, Customer Satisfaction and Loyalty. The results of this research show that, in all aspects, customers' expectations are lower than their perception of bank operations and, in fact, the quality of provided services is low. In addition, these research findings show that customer satisfaction plays a role in mediating the quality of service on loyalty of services (7).

The health sector is one of the main sectors of the country's economy, and is regarded as an infrastructure in the process of economic development, so that most countries are paying special attention to this sector. Maintenance, improvement and promotion of health services is one of the requirements of the community and this is one of the developmental indicators of the countries. Health is a worthwhile asset where maintenance and promotion should be considered as the most important efforts of everyday life of human beings. Considering the mentioned issues the importance of health and that the development of the health system is one of the most important plans and programs that can be done in the country's health field and it plays an important role in the future of health of the country. Since the present study in Yasuj University of Medical Sciences has not previously been done, the aim of this study was to determine the relationship between the implementation of the health system development plan and the satisfaction of patients referred to Yasuj medical and teaching hospitals.

## Analysis Method

This descriptive-correlational study was conducted on patients referred to educational and therapeutic hospitals in Yasuj during the years 2015-2016. Data were collected using available sampling. Morgan table was used to determine the sample size and 381 subjects were selected as samples. A researcher-made questionnaire was used to collect data. The questions in each field were summed up and grouped into the SPSS20 software and were prepared as analytical variables. Respondents did not receive any special training; the questionnaires were given after a brief explanation of the subject of the research. The questionnaire contained two parts:

The first part of the questionnaire included demographic questions (age, sex, education, duration of hospitalization). The second part of the questionnaire consisted of: a researcher-made quality of service questionnaire that included dimensions, tangibility (physical dimension), validity, accountability, assurance, empathy, which was measured using the Likert scale on the 5th option range, which is used extensively and responses were, much, somewhat, little and very poorly designed. B. Researcher-made Patient Satisfaction Questionnaire, which is measured using Likert scale with 5 options.. In order to analyze the data, descriptive statistics and inferential statistics (regression) were used. The data collection tool in this research was a questionnaire.

In order to maintain the validity of the data measurement tool in terms of content, attempts were made to ask questions based on the theoretical basis of the research. Before the questionnaire was distributed among patients, with the cooperation of the professors of the field of management, the necessary amendments were made to the questionnaire to avoid ambiguity for the respondents. The answers in the five groups are very large, large, somewhat, small and very small, giving the questions a

factor of 5-1. The questions in each area were summarized and grouped using SPSS20 software and were analyzed as independent and dependent variables. By entering the variables grouped into SPSS 20, Cronbach's alpha was calculated. For this purpose, in a preliminary study on 20 of the statistical population, the internal reliability of the questionnaire for the implementation of the health change plan was 0.78 and for the satisfaction questionnaire was 0.85. It has been estimated that the validity of the measuring instrument is high.

## Findings

In the descriptive study of the samples, 51.2% of the participants were male and 48.8% were female. Or, in other words, the number of respondents to the questionnaire was 195 men and 186 in women. 28.9% of the research participants belonged to the age group of 15 to 25 years old, 47% of the age group were 26-35 years old, 17.3% of the age group were 36-45 years old and 6.8% belonged to the age group of 46-55 years. 63.5% of the participants had undergraduate and postgraduate studies, 27.3% had an undergraduate degree and a bachelor's degree, 9.2% had a master's degree or higher. 74.8% of the participants in the study were hospitalized for 1-5 days, 14.2% for 6-10 days, and 11% for 11 days and more.

The results of Pearson correlation test show that there is a significant correlation between the implementation of the health care reform plan and satisfaction of patients referring to educational and therapeutic hospitals in Yasuj city at a significant level of 99%. Also, the results showed that there is a significant relationship between all components of health promotion plan and satisfaction of patients (Table 1 - next page).

According to the results of the research, it can be concluded that there is a significant relationship between the implementation of the health system development plan

**Table 1: Pearson Correlation Coefficients**

Variable	Pearson		Abundance
	The correlation coefficient	Significance level	
Physical Dimensions	.674	.003	381
Responsiveness	.587	.001	381
Guaranteed	.662	.001	381
Credit	.625	.006	381
Sympathy	.663	.001	381
Health reform plan	.751	.005	381

**Table 2: regression coefficients**

Variable	Not standardized coefficients		Standardized coefficients	t	The significance level
	B	The standard error	BETA		
Constant	7.198	2.248	**	3.202	.001
Physical Dimensions	1.192	.214	.275	5.577	.001
Responsiveness	.452	.185	.016	.380	.040
Guaranteed	.669	.273	.159	2.446	.015
Credit	.455	.216	.110	2.110	.035
Sympathy	1.049	.162	.370	6.479	.001

in terms of different dimensions (physical dimensions of the hospital, accountability, assurance, reliability, empathy) and satisfaction of patients referred to Yasuj medical and educational hospitals. Based on the calculated beta rate that prioritizes the effect of the variables considered without considering the index, the health care system development change variable, in terms of empathy, has the most roles in satisfaction of patients referred to Yasuj medical and therapeutic hospitals and then the physical dimension, the roles of assurance, validity, and response, respectively (Table 2).

## Discussion

The present study showed that there is a significant correlation between the implementation of the health care reform plan and the satisfaction of patients referring to educational and therapeutic hospitals in Yasuj city in the study of the relationship between the implementation of the health system development plan and the satisfaction of patients referred to educational and therapeutic hospitals in Yasuj. These findings are consistent with the research by Julia et al. (2011), and Sarani et al. (2013). By identifying the priority of influencing the variables, it can be said that the most important variable of the health system's development plan is in terms of empathy; therefore, based on the importance of the variables, it is appropriate to act and to pay more attention to this variable to develop patient satisfaction. In the field of health system development plan, in terms of the physical dimension that is ranked first in the top priority, more efforts should be made and in this context it is desirable to allocate a special budget in the budget of the Health Development Plan.

## Conclusion

In service organizations, providing better and suitable quality is one of the basic strategies for the survival of the organization. Therefore, the most important factor in obtaining patients' satisfaction in Yasuj medical university is to increase the quality of services. The activity of the staff involved in the educational and therapeutic hospitals with patients is critical to the development of effective relationships with the client; therefore, the skills and concerns of employees in this area are important. Because people are ultimately responsible for providing quality services which is what patients expect today. Given that the study area is from less developed areas in the health sector, healthcare managers should be up-to-date and sufficiently able to equip hospitals and centers with sanitary and hygiene equipment and to allocate the necessary funds in this field. To increase the willingness of physicians and health personnel to increase the number of hospitals for such activities and to increase patients' satisfaction. Also, by motivating the staff who are in direct contact with the patient, by increasing wages and benefits such as bringing staff recruitment closer to doctors, reducing working hours and paying attention to the attitude of customer service providers among health care providers, they increase their enthusiasm and empathy.

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# The Effectiveness of Acceptance and Commitment Therapy on psychological Well-being in Diabetes Patients

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## Abstract

**Introduction:** One of the most common chronic diseases is diabetes. Diabetes is a heterogeneous group of diseases of the metabolism that is characterized by chronic hyperglycemia and impaired metabolism of carbohydrates, fats, and proteins and is caused as a result of defects in insulin secretion or insulin functioning. The purpose of this study was to investigate the effectiveness of Commitment and acceptance therapy on psychological well-being in Diabetes patients.

**Methods:** In this study which was Quasi-Experimental with pre-test, post-test and control group, the sample group was selected by available sampling method from patients referred to the Kermanshah Subspecialty Clinic and Training Center. Therefore, 30 female subjects were chosen randomly and assigned to two control and experimental groups (each with 15 subjects). To assess the severity of psychological adaptation, psychological well-being short form Ryff and psychological adaptation of E. Lowell Kelly was used respectively in pre-test. The experimental group experienced the treatment based on commitment and acceptance therapy in eight two hours sessions and the control group did not receive any treatment. These questionnaires were again conducted on both groups in post-test.

**Findings:** The findings indicated that commitment and acceptance therapy has been effective on the improvement of patient's psychological wellbeing ( $p < 0.001$ ).

**Conclusion:** Commitment and acceptance therapy is efficacious on increase of psychological well-being of diabetes patients. So it can be applied as a useful method of intervention for improving psychological adaptation in patients with Diabetes.

**Key words:** Acceptance and Commitment Therapy, Psychological well-being, Diabetes Patients

## Introduction

Type II diabetes mellitus (T2DM), which affects approximately 90 to 95% of diabetics (1), refers to a group of metabolic diseases and their common feature is the increasing blood glucose level due to defective insulin secretion, functional impairment, or both (2). It is one of the most common chronic diseases in all countries, and is dramatically increasing due to changes in the lifestyle of individuals and reduced physical activity (3). It is estimated that by the year 2030, the number of people affected will be more than 366 million (2). The disease has a relatively high prevalence in Iran (2.3), so that the number of people with diabetes in Iran was 7.7% and 6.8% in urban and rural populations over 30 years old in Kermanshah province (4). Among the most important side-effects are the disorders that have negative effect on the ability of the patient to carry out and maintain the recommended medical care (5.6).

Psychological stress can trigger or worsen glucose levels through activating hypothalamic-pituitary-adrenal systems. Although chronic diseases are accompanied with an increased incidence of depression, anger, and stress, this is about three times more common in diabetic patients and the prevalence of depression in these patients is 63.3%. Common emotional response at the time of diagnosis is anxiety and anger, but with the progression of the disease, psychological disorders are more pronounced (7).

Due to the vital roles that psychological well-being plays in various mental-social and even physical aspects of one's life, numerous studies have been conducted about well-being and its components. Some scholars consider psychological well-being as the equivalent of happiness and emotional interaction with others (8). Additionally, based on Ryff and Keyes' pattern of psychological well-being, this construct comprises the six components of purpose in life, positive relations, personal growth, self-acceptance, autonomy, and environmental mastery. From this perspective, the health index is not defined as 'lacking the disease,' so that one's well-being rather than sickness is emphasized (9).

Today, we are facing the third generation of these treatments that can be generally called acceptance-based models such as cognitive therapy based on mindfulness (Mindfulness-based cognitive therapy), Metacognitive treatment, and acceptance and commitment therapy (ACT) (10). In this treatment instead of cognitive change, attempt is made to increase one's thoughts and feelings (11). One of the treatments that have recently been the focus of several researchers is ACT (12). The empirical evidence on the effect of ACT on multiple disorders is on the rise. Therefore, this study aimed to investigate the effect of ACT on psychological wellbeing of patients with diabetes.

## Methodology

### Research design and participants

This is a quasi-experimental study applying pre- and post-test design with the control group, in which after determining and random selection of control and experimental groups, eight intervention sessions each lasting 1.5 hours (90 minutes) were applied to the experimental group, and after therapy sessions, both the control and experimental groups were re-assessed. The population consisted of patients with Type II diabetes referred to Taleghani Speciality and Subspecialty Clinic and Training Center in Kermanshah. Using availability sampling, 40 patients were selected, and applying complete random sampling, even and odd numbers were put in the experimental group ( $n = 20$ ) and the control groups ( $n = 20$ ), respectively.

### Tools

Ryff's Psychological Well-being scale (PWB): This scale was developed by Ryff in 1980. The original scale contained 120 questions, but in further studies done afterwards, shorter forms of the scale were proposed with 84, 54, and 18 questions. In the present study, the 18-item scale was utilized with six-point Likert Scaling (ranging from strongly disagree to strongly agree). In addition, the validity and reliability of this scale has been reported in numerous preceding studies. In a study conducted by Dierendonck (2005), the internal consistency of the subscales of the psychological well-being scale (PWB) was appropriate, and their Cronbach's alpha was between 0.77 and 0.90. The correlations of the psychological well-being scale (PWB) with life satisfaction scale, happiness inventory and Rosenberg self-esteem scale (RSES) were 0.47, 0.58, and 0.46, respectively. In a study performed by Khanjani et al (2014), the reported internal consistency for the entire psychological well-being scale (PWB) was 0.94, and between 0.63 and 0.89 for the subtests. Moreover, in the present study, the correlation coefficient for the entire test through test-retest was 0.76, and between 0.67 and 0.73 for the subtests ( $p < 0.001$ ). In addition, Cronbach's alpha was 0.83 in the present study (13).

The protocol of the training sessions were taken based on the research done by Hayes, Streswell and Wilson in 8 sessions of 90 minutes (14). The summary of the content meeting of each session is presented below [Table 1].

**Table1: The acceptance and commitment therapy protocol**

Session	ACT
1	The limits of control (short and long-term costs and benefits; finger traps), focus on experience (body scan)
2	Values (what you care about, how do you want to live your life)
3	Cognitive defusion (observing thoughts without trying to evaluate or change them)
4	Mindfulness (being in the moment, raisin exercise)
5	Committed action ("road map" connecting values, goals, actions, obstacles, and strategies)
6	Self as context. Metaphor: "Chessboard"
7	Review and continued action in support of values
8	Moving forward

**Procedure**

The experimental group received 8 sessions of acceptance and commitment therapy, while the control group did not receive any intervention. At the end of the intervention, both groups answered the questionnaires. The therapy protocol was implemented by the researcher. The data were analyzed using SPSS application version 23 and covariance analysis statistical method.

**Findings**

The descriptive findings of the present study including statistical indices such as mean and standard deviation of the variable studied, are presented in Table 2.

**Table 2: Mean and standard deviation of psychological wellbeing in pre-test and post-test of variable studied**

Groups	Statistical indices	Pre-test	Post-test
experiment	Mean	65.71	73.20
	Standard deviation	10.64	11.61
control	Mean	64.82	64.58
	Standard deviation	10.56	10.25

As Table 2 shows, mean in the experimental group (Commitment and Acceptance Therapy) increased from 65.71 at pre-test stage to 73.20 at post-test stage. But no significant change was observed in the control group in pretest and posttest stages. Considering the difference observed in the mean of the study groups, average psychological wellbeing in experimental group indicates the effectiveness of the aforesaid procedure.

**Table 3: Results of Leven's test to examine the equality of variances in psychological wellbeing scores**

Variable	F	df <sub>1</sub>	df <sub>2</sub>	Sig
Psychological wellbeing	3.5	1	38	0.09

In order to evaluate the presumptions of the analysis of covariance (ANCOVA), firstly the homogeneity of slopes of pretests and posttest scores were calculated. Multivariate ANCOVA was used to compare experimental and control groups with respect to psychological wellbeing scores. The results showed that the tests were significant ( $P < 0.01$ ). This means that there was a significant difference at least between two groups. The results are shown in [Table 4].

**Table 4: Results obtained from multivariate analysis of covariance on mean scores of post-test of variables in two groups**

	Value	F	Hypothesis df	Error df	Sig	Square Eta
Pillai's trace	0.74	15.41	19	2	0.001	0.74
Wilks lambda	0.29	15.41	19	2	0.001	0.74
Hotelling's trace	4	15.41	19	2	0.001	0.74
Roy's largest root	4	15.41	19	2	0.001	0.74

ANCOVA was conducted to find out the difference observed. Considering the calculated effect size, 74% of total variances of experimental and control groups was the result of effectiveness of the independent variable. Moreover, statistical power of the test was 0.80 which means that the test was able to reject the null hypothesis with a power of 74%. [Table 4] only states that in one of the areas there is a significant difference between experimental and control groups. Multivariate analysis of covariance (MANCOVA) was used to distinguish which area was significantly different. The results are shown in [Table 5].

**Table 5: Results of single-variable covariance analysis on moderated scores of the studied variables**

Variables	Sum of squares	Freedom degree	F	Significance level	Effect size
Psychological wellbeing	1048.54	1	16.51	0.001	0.76

According to Table 5, the results of one-variable covariance analysis between the two groups on the moderated scores of Psychological well-being with  $F=16.51$  and significant level 0.001 indicate a significant difference between the two groups with 99% confidence ( $P < 0.01$ ). Regarding acceptance and commitment therapy with effect size of 0.76, it can be said that 76% of the changes in the dependent variable were due to effectiveness of the independent variable.

## Conclusion

This study aimed to investigate the effect of ACT on Psychological well-being of patients with diabetes. The results of this study using covariance analysis showed that the difference between Psychological wellbeing scores by group membership (experimental and control) in the posttest was significant ( $P < 0.05$ ). Therefore, intervention by acceptance and commitment (ACT) model had a significant impact on Psychological well-being in the experimental group ( $P < 0.05$ ). The findings of the study are consistent with the results of most previous studies including Graham et al., (15) Levin et al., (16) Johns et al., (17) Rigi Kootesh et al., (18) Yazdanbakhsh et al (19) and Kaboudi et al (20).

ACT has been largely and successfully used in improving psychological well-being and coping styles in clients. To explain how this type of therapy affects the mental health indices in chronic patients, especially Type II diabetic patients, it can be said that with respect to clinical observations by referring to the treatment protocol used in this study, the cause can result from change of attitude in thoughts and cause of thoughts, irrational and negative cycle, and faulty thinking. The goal of treatment is, therefore, to start training based on knowledge and creative helplessness compared to previous solutions from the start and subjects' (patients) acceptance of this novel attitude. According to the findings of the study, since variable of psychological acceptance increased before a significant decrease in indicators of mental health, it can be concluded that the variable of acceptance and increased

attention and action value act as mediators in change and are effective in improving the indicators of psychological acute diabetes.

The findings of this study were consistent with previous studies on the effectiveness of ACT chronic Psychological well-being patients, especially Type II diabetes. Moreover the findings showed the importance and necessity of providing solutions for the treatment and prevention of chronic diseases, especially diabetes given that it is one of the most serious diseases in the world. Treatment based on acceptance- and commitment-based model on mental health, can be used as a complementary treatment to enhance mental health and the overall mental state of patients with diabetes along with drug therapy.

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# Relationship between Body Image Concern, Difficulty in Emotion Regulation, and Sexual Satisfaction of Healthy Women with Mastectomy

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## Abstract

Breast cancer is the most prevalent malignant cancers in women of advanced countries and the second most prevalent cancer in Iran. In addition, it is the second cause of death by cancer in women and the main cause of death in 45-55 year-old women. In this regard, there are concerns about the effect of invasive treatment of breast cancer as mastectomy is increasing and quality of life is affected. The objective of the present research is studying the relationship between body image and difficulty in emotion regulation and sexual satisfaction of healthy women who have undergone mastectomy.

Fifty afflicted women with mastectomy who were operated on and fifty healthy women who were their companions were selected by convenience sampling method. The objective of this study with the members of these 2 groups was comparing body image concerns, difficulty in emotion regulation, and sexual satisfaction between healthy women and women with mastectomy in Isfahan in 2016. The methodology was causal-comparative. People filled out difficulty in emotion regulation scale (Gratz and Roemer, 2004) with 0.86 reliability, and the body image concern inventory (Littleton, 2005) with 0.89 reliability, and Larson's sexual satisfaction questionnaire (Larson et al., 1998) with 0.93 reliability. SPSS 22 software, descriptive statistical method (mean, standard deviation), and inferential statistical method (multivariate variance analysis) were used to analyze the hypotheses. Results showed that there is no significant difference between difficulty in emotion regulation and its dimensions (emotional rejection, difficulty in carrying out purposeful behavior, impulse control difficulty, lack of emotional awareness, limited access to emotion regulation strategies, lack of emotional clarity, and total difficulty) in women with mastectomy and healthy women ( $P>0.05$ ). There was no significant

difference regarding body image concern in women with mastectomy and healthy women. ( $P>0.05$ ). In addition, results showed that there is significant difference between sexual satisfaction in women with mastectomy and healthy women. ( $P<0.05$ )

**Key words:** mastectomy, difficulty in emotion regulation, body image concern, sexual satisfaction

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## Introduction

### Problem statement

Cancer is a type of disease featuring uncontrolled growth and attack causing local and systemic metastases. Breast cancer is the most prevalent cancer of women in the world as a cause of death second in rank after cardiovascular disease. Fortunately, advances in breast cancer screening and treatments increase life expectancy to 50% by keeping women alive for 5 or more years after diagnosis of the disease. This issue leads to focus on quality in life issues and attention to the sexuality, and it is shown that women's sexuality becomes more sophisticated after mastectomy operation. (Altun, 2011) Sexual-mental changes after mastectomy treatment include panic of losing fertility, negative body image, losing feminine appeal, depression, and anxiety. The sexual objection spectrum includes painful intercourse, vaginal dryness, loss of libido, and breast numbness. (Emilee, 2010). Breast cancer is one of the diseases causing intensive mental effects. Many afflicted women suffer from mental problems such as depression and anxiety and undergoing operations such as surgery and chemotherapy which have side effects. These intensify the mental problems. What is studied in this research is body image concern, difficulty in emotion regulation, and sexual satisfaction.

### Definition of Body Image

Body image includes conscious and unconscious emotions about body, as a constitutional concept about individual emotions about body size, performance, and ability to achieve objectives. (Graven, 2003) The expression of body image has two perceptual and attitudinal aspects. The perceptual aspect of body image is related to the manner of seeing sizes, shape, weight, face, movements, and actions, while the attitude aspect is related to individual feeling about these traits, and how these feelings guide his/her behavior. (Galison, 2006) Researchers have shown that women with a more positive body image are more satisfied with their lives (Giddens, 2007). The body image concept was defined for the first time by Shoulder as a psychological view toward the human body that is shaped in minds, and how the body represents itself for humans. This concept has two main aspects of body image, capital and body image evaluation in that body image capital is attributed as the importance degree of behavior and cognition about a person's body and appearance, and body image evaluation is related to the satisfaction or dissatisfaction degree of people's appearance. (Harginson, 2009) Mental health professionals have conducted many studies in this field regarding the importance of body image in social communications and interpersonal relationships. It seems that people with a good feeling about themselves usually have good attitude to life. A positive body image of an individual creates a valuable feeling in an individual and the changed mental image leads to changes in sense of personal value. (Canaless, 2010).

Cash (1997) states that body image is a structure different from the real appearance of an individual. In other words, it returns to the specific and personal relationship of an individual with his/her body. It is a representation of

beliefs, perceptions, emotions, and activities relating with the physical appearance of an individual. Body image is the mental image each person has of his/her body.

### Definition of Emotion

The term "emotion" refers to the inner thinking, feeling, and mental mode and a range of individual intentions to act on and be used. (Golma, 2004). Emotion is a specific inner and mode starting with interpretation of a situation in a specific manner and then making internal physiological changes which finally lead to the balance between organism and environment.

### Emotion Regulation

Emotion regulation refers to the way people are influenced by their emotion and how they experience emotions. Difficulty in emotion regulation can be the result of lack of emotion regulation abilities and capabilities. (Cotinho et al., 2010) Emotion regulation is considered as a process of moderating emotions to respond to the conscious and unconscious environmental expectations. (Aldao, Nolen, Hoeksema & Schweizer, 2010) Emotion regulation is known as using an effective strategy in reduction, increase, oppression, or survival of emotions, and it is believed that motion regulation is one of the inherent characteristics of man. Emotion regulation creates a specific response to emotion and helps us to modify individual emotional responses. (Gras, 1995)

## Cognitive Emotion Regulation

Cognitive emotion regulation refers to all cognitive styles that each person uses to increase, reduce, or keep together their emotions in stressful situations. (Grass, 2001)

Granefski & Kraaij (2002) proposed 9 different cognitive emotion regulations about cognition coping strategies that are divided as following:

**A) Maladaptive strategies for cognitive notion regulation:**

- 1- self-blaming: thought of knowing yourself guilty and blaming yourself,
- 2- rumination: occupation of mind by related thoughts and emotions to negative instances,
- 3- catastrophizing: though panic,
- 4- other blaming: thought of believing others are guilty and blaming others

**B) Adaptive strategies for cognitive notion regulation:**

- 1- acceptance: through evidence comes acceptance,
- 2- positive refocusing: thinking about enjoyable and happy issues instead of thinking of the real situation,
- 3- refocusing on planning: thinking of the steps toward coping with negative realities or changing hemt.
- 4- positive reappraisal: thinking of the positive aspects of the situation,
- 5- putting into perspective: related thoughts to the minority of an evidential situation or emphasis on its relativity in comparison to other evidence.

### Difficulty in Emotion Regulation

Regarding the positive and constitutional role of emotions in human life, another aspect represented is the destructive aspect of emotions in people lives. (Wimrogress, 2010)

This double performance of emotions refers to the emotion regulation process in which people regulate and moderate their emotions according to various situations. Emotional regulations are said to be regulating emotional processes. Therefore, difficulty in regulation means emotion irregularity. Many people think their emotional irregularity is equal to lack of control of emotions. In addition, when these cases are compared, emotional irregularity is called a disability in experiencing, expressing, and using emotions. When people's emotions become irregular, they report the emotion of losing control. They don't have talent to take and take things in their stride. (Huang, 2006). Difficulty in emotion regulation is a key element in several mental pathologies for specific disorders such as individual personality disorder, major depression, bipolar disorder, generalized anxiety, social anxiety, eating disorders and substance abuse disorders and alcohol disorders where difficulties in emotional regulation have been studied. (Gratz and Roemer, 2004). Disabilities in emotion regulation are infrastructure mechanisms for morale and anxiety disorders.

Aldao (2010) studied the relationship between inefficient strategies in emotion regulation and mental harm in meta-analytical research on 241 effects in 144 articles. Results showed that strategies such as rumination, oppression, prevention from reaching a solution have the maximum effect on mental disorders. Moreover, depression disorders and anxiety are more and more aligned in relationship with inefficient strategies of emotion regulation in various research in comparison to the disorders of eating and drug abuse. According to researchers, people with various emotional disorders use different strategies in facing miserable conditions. Evidence of studies have shown that depression is not only known by abnormal emotional experiences (for example low positive and high negative affect), but also is indicated by inefficient strategies of emotion cognition. In medical cases, using rumination predicts response to negative emotions, at the start, duration, and ascending period of depression.

Moreover, defects in cognitive emotion regulation play a central role on development of depression. (Marroquin, 2011) the anxious and depressed people try to prevent their negative emotions. They fail to do so and this returns and they appraise it as negative emotions. These people use emotional prevention as a strategy to improve their morale. In addition, people by anxiety and depression may use other maladaptive strategies such as situational avoidance, using safety signs to give attention, rationalization, or drug abuse to release negative emotions. These people will lose the opportunities of learning adaptive and effective methods of facing pressure and anxiety by non-accepting of the negative emotion experience. (Campbell\_Sills & Barlow, 2007)

Studies have shown that skills are significantly related with various indexes of mental health in the ordinary and medical population and difficulties of emotion regulation can be the beginning of mental disorders. (Berking-Margraf-Ebert-Wupperman-Hofmann & Junghanns, 2011)

Difficulties of emotion regulation are the relationship between characteristics of borderline personality and extreme subjectivism (Sharp et al., 2011).

### **Regulated and Unregulated Emotion**

Cognitive emotion regulation is always with humans assisting in management or emotion regulation, and feelings and provides adaptation power, particularly after negative emotional experiences. (Morris Silk Steinberg Mayors & Robinson, 2007)

Since the ability of emotion regulation can determine the quality of individual relationships people who can regulate their emotions can understand their and others emotions better. Consequently, they have a better perception about people in various conditions and have more developed interpersonal and intrapersonal skills. Therefore, such people have better relationships than people who have difficulties in emotion regulation. (Lupes et al., 2004) People who have difficulty in emotion regulation protect their relationships, and feel that they are in negative models of relationships with others, they feel out of control; therefore, they have less sexual satisfaction. (Abbot, 2005)

### **Sexual Relationships and Satisfaction**

Sexual satisfaction or satisfaction from sexual relationship is considered as one of the marital satisfaction elements that are important indexes of successful marriage, survival, and health of the family.

Sexual relationship is influenced by emotional relationships among spouses and sexual dissatisfaction, can create various family problems. Sexual dissatisfaction reduces health, life time, and satisfaction with life, growth of disorders, imperfection of spouses, and separation of the marital relationship. (Soderberg, 2013)

Sexual relationships by being impressed on thoughts and emotions of spouses can influence relationships among them directly and indirectly in extensive spectrum. It means spouses with adaptation in this field are happy, able to neglect their life inconsistencies, while life inconsistency can have harsh side effects in spouses with sexual dissatisfaction. (Rahmani, Sadeghi, Allahgholi, Marghati Khuei, 2010)

Among sexual needs, sexual instinct has a deep mixture with mental needs and its effects can be observed in many life aspects. This instinct has an undeniable effect on marital life, its consistency, and durability. Moreover, it has an important and infrastructural role between health and mental equilibrium. Sexual desire stays far from other biological needs by these significant characteristics and changes to a mental need. Sexual satisfaction is not just a physical pleasure it includes all the remained emotions after the positive and negative aspects of sexual relationship. Sexual satisfaction includes individual satisfaction from sexual activity to reach orgasm. Sexual life satisfaction is divided into 5 classes:

**A) Interpersonal variables:** quality of marital relationship and interactions; sexual self-presentation.

**B) Physiological variables:** amount of sexual activity and orgasm experience, **C) sexual schema variable.** **D) Personal variables:** women's knowledge and awareness, sexual disorders, personality traits, physical disease, mental problems, sexual self-confidence, sexual harm in childhood. **E) Demographic variables:** age, marriage duration, theirs and spouses education (Baghiyan, 2013). Perhaps out of fear and anxiety, shame, embarrassment or feelings of inadequacy and guilt it can stay hidden and not be stated. In many cases, these problems are hidden and may show themselves as symptoms such as physical bothersome irritability or depression and dissatisfaction with marital life leading to intensive family disputes and divorces (Ohadi, 2007).

Haide & Delamater (2006) believe that in cases with anger or failure, the sexual relationships among spouses is damaged leading to sexual dissatisfaction in some cases of sexual disorders. The problems in sexual relationships can be a sign of other problems in marriage, and the so-called problem is from somewhere else. Dissatisfaction with sexual relationships can lead to deep problems in spouses causing them to detest their spouse, annoyance, jealousy, competition, sense of revenge, feelings of humiliation, lack of confidence, and so on. These problems are reinforced or represented by stresses and disputes and deepen the gap among spouses. (Christopher & Spercher, 2000) Men and women can have dispute about the number and time of sexual relationships. Pride plays a role in most sexual relationships. Women's perception of femininity and man about manhood is mostly related to the reaction of their partner. Having a sense of being accepted and reciprocal pleasure reinforces the sexual instinct, and reduction of sense of love, companionship, and acceptance can weaken it.

### **Difficulty in Emotion Regulation Scale**

The difficulty in emotion regulation is a self-reporting index made to evaluate the difficulties in emotion regulation. It has 36 clauses and 6 sub-scales as follows:

Lack of emotional acceptance: includes clauses (11, 12, 21, 23, 25, and 29). Impulse control difficulty: includes clauses (3, 14, 19, 24, 27, 32); lack of emotional awareness includes clauses (2, 6, 8, 10, 17, 34), limited access to emotional regulation strategies includes clauses (15, 16, 22, 28, 30, 35, and 36), and lack of emotional clarity includes clauses (1, 4, 5, 7, and 9). The clauses 1, 2, 6, 7, 8, 10, 17, 20, 22, 24, and 34 are reversely scored. Related results to study the reliability by Gratz and Roemer showed that this scale has high internal consistency (total scale  $\alpha=0.86$ ), awareness sub-scale ( $\alpha=0.80$ ), strategies sub-scales ( $\alpha=0.88$ ), clarity subscale ( $\alpha=0.84$ ), and reliability of test-retest for total score of this scale is  $\alpha=0.88$ . The validity of this study shows structure validity with good prediction for this scale (Gratz and Roemer, 2004). The accountability scale is five-point (nearly never=1 to nearly always=5) where 1 means never (0-10%), 2 means sometimes (11-35%), and 5 mean nearly always (91-100%). Each factor is in a range of 1-5. Higher scores show more difficulty in emotion regulation. In Alavi et al's (2011) research, this

scale was used in Iran for the first time. In this research, Cronbach's alpha coefficient for the total scale was reported as 0.86.

### **Body Image Concern Inventory**

This scale was produced by Littleton et al. (2005) to evaluate people's concerns about their appearance. Littleton et al. conducted this inventory on 1,403 people for evaluation and preparation. Cronbach alpha's coefficient was obtained as 0.893 and internal validity coefficient was 0.92 using Cronbach's alpha coefficient. Moreover, high correlation with other scales in this field have been shown. For example, reliability of this scale with body dysmorphic disorder questionnaire in 0.001 sig. level was obtained at 0.83 ( $T=0.83$ ) which shows the high validity of this scale. This inventory is self-assessment with 19 questions that each has 5 points from 1 (never) to 5 (always). Basakzadeh and Ghaffari (2007) reported this inventory based on internal validity by Cronbach's alpha coefficient 0.95 in Iran. Entezari and Alavi (2011) also reported internal validity as 0.89 by Cronbach's alpha coefficient.

### **Sexual Satisfaction Scale**

Larson sexual satisfaction was created by Larson et al. (1998) including 25 questions by Likert five-point spectrum questionnaire that has 1 (never), 2(seldom), 3(sometimes), 4(often), 5 (always) that numbers of questions are as following: 1-2-3-10-12-13-16-17-19-21-22, and 23 and other questions were reversely scaled. In other words the questions 4.5.6.7.8.9.11.14.15.18.20.24. and 25 were scored as following: 5 never, 4 seldom, 3 sometimes, 2 often, and 1 always. Scores are generally 25-125 according to this scale, and sexual satisfaction scores less than 50 indicate lack of sexual satisfaction level, 51-75 to low satisfaction, and 76-100 to medium satisfaction, and 101 or higher is high satisfaction.

Shams Mofarahe (2001) under the title of "study the effect of marital counselling on couples' sexual satisfaction reported 0.90 and 0.86 for validity and reliability, respectively. Moreover, in Bahrami's research under the title of "study the sexual satisfaction and depression among fertile and infertile couples obtained 0.93 for Cronbach's alpha coefficient.

### **Data Analysis**

*1- frequency table and descriptive indexes of research variables (Table 1 - next page)*

As is seen in Table 2 from all afflicted to mastectomy, 5 people (10%) had 1 child, 15 people (30%) had 2 children, and 30 people (60%) had more than 3 children. In addition, as is seen in table (4-2), 6 from all 50 members of the healthy women group (12%) didn't have any children, 26 (52%) had 1 child, 14 (28%) had 2 children, and 4 (8%) had 3 and more children.

Table 3 shows the results of presumptions of multivariate variance analysis.

**Table 1: Frequency and frequency percentage of two research groups based on marital status background**

Row	Marital status background	Mastectomy		Healthy	
		Frequency	Percent Frequency	Frequency	Percent Frequency
1	1 year and less	0	0	0	0
2	2 years	0	0	15	30
3	3 years	2	4	21	42
4	4 years and more	48	96	14	28
5	Total	50	100	50	100

Table 1 shows frequency and frequency percentage of two groups based on number of children.

**Table 2**

Row	Number of children	Women with mastectomy		Healthy Women	
		Frequency	Percent Frequency	Frequency	Percent Frequency
1	0	0	0	6	12
2	1	5	10	26	52
3	2	15	30	14	28
4	3	30	60	4	8
	Total	50	100	50	100

As seen in Table 2 from all afflicted to mastectomy, 5 people (10%) had 1 child, 15 people (30%) had 2 children, and 30 people (60%) had more than 3 children. In addition, as is seen in table (4-2), 6 from all 50 members of the healthy women group (12%) didn't have any children, 26 (52%) had 1 child, 14 (28%) had 2 children, and 4 (8%) had 3 and more children.

Table 3 shows the results of presumptions of multivariate variance analysis.

**Table 3: Results of Kolmogorov-Smirnov test (normal distribution of data) and Levine test (equal variances) in determination difficulty in emotion regulation, body image, and sexual satisfaction**

Row	Variables	Dimensions variable	Levine test		Kolmogorov-Smirnov test	
			Statistics	sig. level	Statistics	sig. level
1	Difficulty in emotion regulation	Rejection	3.384	0.069	35.080	0.028
2		Difficult in purposeful behaviors	3.710	0.057	28.820	0.051
3		Impulse control problems	1.968	0.164	26.500	0.231
4		Lack of emotional awareness	0.002	0.962	46.160	0.001
5		Limited access to strategies	1.166	0.283	30.140	0.262
6		Lack of emotional clarity	1.091	0.299	52.320	0.000
7		The overall difficulty	1.649	0.202	19.680	1.000
8		Body Image	2.007	0.160	44.000	0.598
9		Sexual Satisfaction	0.053	0.819	28.260	0.997

As seen in Table 3, difficulty in emotion regulation are in sub-scale (rejection, difficulty in carrying out purposeful behavior, impulse control problems, limited access to strategies ( $P>0.05$ ), and lack of emotional awareness, and lack of emotional clarity ( $P<0.05$ ). Except the sub-scale of lack of emotional awareness and lack of emotional clarity whose normality and equal variance are considered, other sub-scales have distributed normality ( $P>0.05$ ) and equal error variance in healthy and mastectomy groups. It is noticeable that multivariate variance analysis is strong against violating some presumptions and results are reliable. In addition, body image concern variable has considered distributed normality ( $P>0.05$ ) and equal error variance between healthy and mastectomy groups. However, according to table 3 sexual satisfaction has normal distribution ( $P>0.05$ ) and error variance are equal between healthy and mastectomy groups.

**Table 4: descriptive indexes (mean and standard deviation) of difficulty in emotion regulation, body image, and sexual satisfaction in the two healthy and mastectomy groups**

Row	Difficulty in regulating emotions	Mastectomy		Healthy	
		M	SD	M	SD
1	Emotional rejection	15.5000	6.94365	13.6400	5.16961
2	Difficulty in carrying out purposeful behaviors	13.6200	5.28336	13.6200	4.33255
3	Impulse control difficulty	15.46600	6.40539	15.0600	5.50477
4	Lack of emotional awareness	16.6600	4.84288	16.9800	4.62685
5	Limited access to emotional strategy	20.3000	7.91859	20.1000	7.50892
6	Lack of emotional clarity	11.8600	3.60844	11.4800	3.75386
7	Total difficulty	92.8400	25.85151	90.5800	21.44008
8	Body Image	40.5200	17.17169	42.7600	14.16745
9	Sexual Satisfaction	86.1400	16.69047	95.5000	16.60372

As seen in Table 4, difficulty mean in emotion regulation (emotional rejection in mastectomy group is 15.500 and in healthy group is 13.6400), difficulty in carrying out purposeful behavior (136.200 in mastectomy group and 13.6200 in healthy group), impulse control difficulty (15.46600 in mastectomy group and 15.0600 in healthy group) lack of emotional awareness (in mastectomy group is 20.3000 and in healthy group is 16.9800), limited access to emotional strategies in mastectomy group is 20.3000 and in healthy group is 20.1000), and lack of motional clarity (in mastectomy group is 11.8600 and in healthy group is 11.4800).

### Findings of Research Hypotheses

#### **First hypothesis**

There is significant difference between difficulty in emotion regulation (emotional rejection, difficulty in carrying out purposeful behavior, impulse control difficulty, lack of emotional awareness, limited access to emotional strategies, lack of emotional clarity, and total difficulty) between mastectomy and healthy women.

#### **Second hypothesis**

There is significant difference in body image between mastectomy and healthy women.

#### **Third hypothesis**

There is significant difference in sexual satisfaction between mastectomy and healthy women.

Multivariate variance analysis on elements of difficulty in emotion regulation, body image, and sexual satisfaction between mastectomy and healthy women.

**Table 5**

Row	Difficulty in emotion regulation	Sum of squares	Degrees of freedom	Mean Square	F coefficient	Sig. level	Chi-share ( $\eta$ )	test ability
1	Emotional rejection	86.490	1	86.490	2.308	0.132	0.023	0.325
2	difficulty in carrying out purposeful behavior	0.000	1	0.000	0.000	1.000	0.000	0.50
3	impulse control difficulty	4.000	1	4.000	0.112	0.738	0.001	0.63
4	lack of emotional awareness	2.560	1	2.560	0.114	0.736	0.001	0.63
5	Limited access to emotion regulation strategies	1.000	1	1.000	0.018	0.895	0.000	0.52
6	Lack of emotional clarity	3.610	1	3.610	0.266	0.607	0.003	0.80
7	Total difficulty	127.690	1	127.690	0.226	0.635	0.002	0.76

**Hypothesis 1-1** There is significant difference between difficulty in emotion regulation (emotional rejection, difficulty in carrying out purposeful behavior, impulse control difficulty, lack of emotional awareness, limited access to emotional strategies, lack of emotional clarity, and total difficulty) between mastectomy and healthy women.

As seen in Table 5, there is no significant difference in emotion regulation between healthy and mastectomy women ( $P>0.05$ ). Therefore, hypothesis 1-1, based on significant difference in emotion regulation between healthy and mastectomy women, is not confirmed.

Body Image	Sum of squares	Degrees of freedom	Mean Square	F coefficient	Sig. level	Chi-share ( $\eta$ )	Test ability
	125.440	1	125.440	0.506	0.478	0.005	0.109

**Hypothesis 1-2** There is significant difference in body image between mastectomy and healthy women. As it is seen in table 5 there is no significant difference in body image between healthy and mastectomy women ( $P>0.05$ ). Therefore, hypothesis 1-2, based on significant difference in body image between healthy and mastectomy women, is not confirmed.

Sexual Satisfaction	Sum of squares	Degrees of freedom	Mean Square	F coefficient	Sig. level	Chi-share ( $\eta$ )	Test ability
	2190.240	1	2190.240	7.903	0.006	0.075	0.795

**Hypothesis 3-1** There is significant difference in sexual satisfaction between mastectomy and healthy women. As it is seen in table -5, there is significant difference in sexual satisfaction between healthy and mastectomy women ( $P<0.05$ ). Therefore, hypothesis 1-3, based on significant difference in sexual satisfaction between healthy and mastectomy women, is confirmed.

## Conclusion

The present study aimed to compare difficulty in emotion regulation, body image, and sexual satisfaction between mastectomy and healthy women in Isfahan city. The methodology was causal-comparative to analyze data by multivariate variance analysis (MANOVA), statistical population of this study includes all women afflicted with breast cancer who had undergone mastectomy and 50 mastectomy patients and 50 healthy women (among the patients' companions) were selected and tested as a sample by convenience sampling method. Measurement instrument was Difficulty in Emotion Regulation Scale (DERS), Body Image Concern Inventory (BICI), and Larson Sexual Satisfaction Questionnaire (LSSQ).

1- There is significant difference between difficulty in emotion regulation (emotional rejection, difficulty in carrying out purposeful behavior, impulse control difficulty, lack of emotional awareness, limited access to emotional strategies, lack of emotional clarity, and total difficulty) between mastectomy and healthy women.

According to the first hypothesis in Table 5, difficulty in emotion regulation and its elements are not significant. Therefore, the first hypothesis is not confirmed which is based on the significant difference between difficulty in emotion regulation (emotional rejection, difficulty in carrying out purposeful behavior, impulse control difficulty, lack of emotional awareness, limited access to emotional strategies, lack of emotional clarity, and total difficulty) between mastectomy patients and healthy women. These findings are in disagreement with some previous research results.

2- There is significant difference in body image between mastectomy patients and healthy women.

According to the second hypothesis from table 5, it is seen that there is no significant difference in body image between mastectomy and healthy women. Therefore the second hypothesis based on difference in body image between mastectomy and healthy women is not confirmed. These findings are in disagreement with some previous research results.

3- According to the third hypothesis from table 5, it is seen that there is a significant significant difference in sexual satisfaction between mastectomy and healthy women. Therefore the third hypothesis is confirmed. These findings are in agreement with some previous research results.

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# Live experience of nurses about occupational exposures in emergency wards

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## Abstract

**Background and Objective:** Health Care Workers (HCW) are exposed to viral infections such as hepatitis B, hepatitis C and HIV. Major occupational hazards of infection transmission in health centers are injuries from sharps and exposure to pathogens and infectious can be transmitted through blood. The purpose of the study was to “explore live experience of nurses about occupational exposures in emergency wards”.

**Materials and Methods:** A qualitative approach using content analysis was adopted. In-depth and semi-structured interviews were conducted with 14 nurses in the emergency ward. Content analysis was performed to analyze the data.

**Results:** Five major categories emerged from the data analysis, including improvidence, fear, stigma, lack of support, follow-up.

**Conclusion:** The results of this study show that there is complex process for follow-up and lack of support after occupational exposures. Since the emergency ward is a heart hospital, there is a need for taking standard precautions, and post occupational exposure design and operational processes.

**Key words:** nurse, occupational exposures, emergency ward

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## Introduction

Medical personnel are routinely exposed to viral infections, including hepatitis B, hepatitis C and HIV (1-2). Occupational exposures to the blood-borne pathogens occur in medical personnel percutaneously by needle stick and sharp and cutter tools, exposure to mucous membranes and unhealthy skin (3). Evaluating the status of needle stick injury in hospitals is important both in terms of medical personnel and hospital managers and in spite of the guidelines and training programs provided to the staff, the rate of needle stick injury is increasing. Needle stick injury is a major occupational hazard for health care workers (4). According to the World Health Organization, 16,000 cases of hepatitis C, 66,000 cases of hepatitis B and 1,000 cases of HIV have been reported annually following occupational exposure (5). In the United States, 600,000 to 1,000,000 occupational exposures through percutaneous exposure and 200,000 cases through exposure to mucous membranes with blood and other body fluids are reported annually (5). A study conducted in Iran showed that 65.62% of the healthcare workers had once been injured with sharp and cutter tools and 43.11% of them were nurses who were in contact with the sharp and cutter tools (6). According to the reports, a case of serious blood-borne infection could cost \$1 million to conduct laboratory tests, follow-ups, costs of disability, and loss of working time, while the cost of preventing a suspected infectious illness is estimated at \$ 3,000 (7). The economic cost of contact with sharp objects in the United States is estimated at \$51-3766, which includes about 14 to 839 people per 1,000 working in health care clinical settings, but in Iran, there are not enough precise statistics regarding the costs of needle stick injury. The lack of proper and timely reporting of occupational exposure is one of the most important problems in the management of infection control (8). The reasons for not reporting occupational exposure can be the lack of effect of the injury report on the process of the disease, lack of knowledge, examination of the patient and the conclusion that the patient is not infected with the disease, the history of uncomplicated injury, the safety against hepatitis B, high workload and lack of a systematic approach (especially the type of injury report) to report and follow-up injuries and to protect the injured person by the managers (9-10).

A study conducted in Tehran showed that 36.17% of the participants indicated that occupational exposure had a negative effect on their lives, 42.68% had follow-up after contact with the sharp and cutter tools and where immunoglobulin was injected, and performed the necessary laboratory tests, and 7.44% of them had to receive anti-HIV drugs (6, 11). The emergency department is considered as the busiest, most diverse and sensitive ward of the hospital. On average, this part occupies 50 percent of hospital beds. Emergency department employees are at higher risk of occupational injuries than other departments. Extreme work speed and pressure in the emergency department, fatigue and high tension of the staff, and dealing with blood and body secretions of emergency patients are among the reasons that increase the risk of exposure (12). Another issue is that, nurses in the emergency department are the largest medical treatment group (13). Considering the fact that so far no study has been done in Iran to explain the experiences of nurses regarding occupational exposure in emergency departments, this study was designed with the aim of "Nurses' experiences of occupational exposure in emergency departments of Tehran University of Medical Sciences in 2012".

## Materials and Methods

This qualitative study was done by content analysis method. Considering the title and purpose of this research, and since the qualitative research is a suitable method for describing life experiences and meaning for them, and the application of this method can contribute to the development of nursing science (14), therefore the present study is qualitative. The research environment in this study was the emergency departments of teaching hospitals affiliated with Tehran University of Medical Sciences. Purposive sampling was used in this study, during which 14 nurses (8 women and 6 men) were interviewed to achieve saturation of information. The criterion for reaching data saturation was the lack of more emerging data and non-repetitive information in subsequent interviews. Participants' inclusion criteria were having at least three years of clinical experience and a willingness to express their experiences so that they can freely exchange their feelings regarding these experiences. All interviews were conducted by the first researcher. A semi-structured interview was used for data gathering, which is suitable for qualitative research due to its flexibility and depth. One of the main questions of the interview was: What experience do you have as a nurse in terms of occupational exposure in the healthcare ward? The duration of the interviews lasted between 20 to 65 minutes with an average of 40 minutes, and they were individually conducted. The process of determining the validity and reliability of qualitative research differs from quantitative research. The rigor in this study was ensured by using the proposed criteria by Guba and Lincoln (15). In this research, four criteria for trustworthiness of qualitative research were used, i.e., credibility, transferability, dependability and confirmability. Credibility by time sampling and members and peer checking, transferability by dense description and comparison of participants to demographic data, dependability by dense description of research methods and code-recode procedure, and confirmability by avoiding any bias or prejudice during the interview, was assured.

The conventional content analysis method was used to analyze the data. Interviews were digitally recorded, word-by-word transcribed and typed, reviewed, coded and immediately analyzed. In fact, data gathering and analyzing was done continuously and concurrently. For primary coding, the words of participants or in vivo coding and indicative coding (the researcher's perceptions of the statements) were used and followed by subsequent interviews. The units of meaning from the participants' statements were extracted from the interviews in the form of primary or open codes; the codes were reviewed several times and were classified in a category based on the similarity and proportionality of the subject. Data categorization was done by assigning separate codes, repeated review, and merging similar codes and then the second level (axial) encoding or data classification was formed. In the next stage, the categories were also compared and each that were similar in characteristics were integrated and formed a broader category to emerge from the themes. During the research process from data

gathering to analysis, to ensure the research ethics, informed consent form was taken from all participants. In this form, permission to record interviews and use the information anonymously was acquired from the participants. At the end of each interview, the use of interviews by maintaining the confidentiality of the participants' names was emphasized, and all participants agreed to their comments being used

anonymously in this study and any information that indicated the participant's name was deleted. Participants were assured that their information would be kept confidential and the recorded interviews would be cleared after the transcription. Participants were assured that they had the right to retire at each stage of the research.

## Findings

Of the 14 nurses who participated in this study, eight were female and six were male. The age of participants was 27 - 45 years with a mean of  $31.2 \pm 1.4$  years old and mean job experience of them was 9.2 years. The majority of participants were nurses (N= 8, 67%).

**Table 1: Participants' Demographic Data: Number (Percent)**

Variable	Number	Percent	
Age	Less than 35 years old	3	21.4
	36-45 years old	8	57.1
	More than 45 years	3	21.4
Sex	Male	6	42.8
	Female	8	67.1
Educational level	Less than a bachelor's degree	3	21.4
	Bachelor's degree	9	64.2
	Higher than bachelor's degree	2	14.2
Job experience	Less than 10 years	7	50
	11-20 years	5	35.7
	More than 20 years	2	14.2
Job position	Paramedic	1	7.1
	Nurse	8	67.1
	Head nurse	2	14.2
	Supervisor	1	7.1

The findings of this study were merged into 186 codes, 18 sub-categories and five main categories, which are as follows:

Main categories	Sub-categories
Careless	Non-observance of standard precautions
	Lack of equipment
	Lack of ward safety
	Lack of thinking or concentration when performing care measures
Worry	Having stress
	Hide information from family
	Revealing information to the family
	Long-term trouble
	Misery in life
	Cancel the work
Stigma	False belief in society
	Inappropriate definitions in the way of transference
	Discrimination in the society
Lack of support	Lack of monthly payment per workload
	Failure to take responsibility for costs
	Lack of support from colleagues and family
Follow up	Multiple laboratory tests
	Multiple counseling

### Careless

One of the main factors in contamination of nursing staff with the patients' blood is the lack of use of precautions and the carelessness of colleagues. Having multiple care requirements simultaneously, failing to observe standard precautions, overcrowding, high referrals of patients, and lack of cooperation from other colleagues while caring for patients is considered to be effective in their carelessness.

*"...When there are a lot of patients in the ward, the noise causes me to be annoyed. I went to get the patients' blood sample, I realized that there were a lot of gloves in the ward, but the glasses were not in the ward for me to wear, so the patient's blood was poured on my face and head, I washed it with plenty of water, but I feel the blood is sticking to my face..."* (Participant 2)

### Worry

Worries after occupational exposure develop concerns and stress, which are one of the most important problems for nurses.

*"...When I discovered that my patient is HIV positive, it seems as if I was at the end of my life. I did not know what to do, I did not know who to deal with my problems, I thought very much, I contacted the counseling center who talk to me very much to make some of my stress seem to be small, from the center of the counseling that I came out, I reappeared like before..."* (Participant 2)

### Stigma

Stigma is important because people in the community due to lack knowledge think that the disease has not been created through an occupational exposure so consider the illegitimate sexual relationships as the most important factor.

*"...I had been talking to my family that I had needle stick injury during inserting IV access device for a patient with hepatitis, which means that the needle of the syringe has fallen into my hands, my family members told me that you should separate your dish and even the linen from our appliances, when my nephew wanted to come to me, his mother nodded and said, do not, he may be ill..."* (Participant 1)

### Lack of support

The lack of support from hospital managers and family members has been another unpleasant experience for the nurses working in the emergency department.

*"...When the blood sample poured into my head and face, I took the primary infection control steps and informed the supervisor who introduced me to the lab; the lab said that the infectious disease control supervisor should be approved to make the costs free; otherwise you should pay the price. The shift was overnight, and finally, with the help of the night manager, the lab accepted my blood sample. 48 hours later, when I came to get my lab test answer, the supervisor of the nursing office said: "What is going to happen so the needle is constantly falling into your hands? Are you thinking to get sick leave?..."* (Participant 11)

### Follow up

One of the necessary measures after occupational exposure is long-term follow-up, which is one of the experiences of the emergency nursing staff.

*"...I should continue to conduct lab tests for two weeks, after I came back to my hospital counseling center, they told me to come to an infectious disease control specialist tomorrow, when see the lab test answer, told me that you should do the HIV exam four weeks after the date of the needle stick, according to my concern, I introduced a psychiatric specialist ..."*

## Discussion

One of the findings of this study was staff carelessness. Studies have shown that with observance of standard precautions by healthcare workers, the prevalence of contact with patients' blood and discharges decreases and observing these precautions is the best way to protect employees against occupational diseases (16-17). The Center for Disease Control (CDC) has identified standard precautions as an appropriate strategy for controlling blood-borne diseases (18). In 1994, the US Centers for Disease Control and Prevention have developed a comprehensive precaution to minimize the risk of contamination of health care workers with blood-borne pathogens.

The study of Mirzaee et al. (2013) showed that the participants did not accept compliance with the standard precautions and considered it not only to be not useful, but also to be considered as harmful (19). In the study of Artimani et al. (2012), the rate of observing standard precautions was 5% (20). Jalalinia and colleagues (2006) showed that only half of the nurses implement safe injection methods. The overall observance of precaution measures in male and female employees of Mazandaran University of Medical Sciences was 1.4% and 6.5%, respectively (22).

One of the findings of this study was worry. The study of Raghavendran et al showed that the damage caused by sharp and cutter objects causes worry and a particular concern, both in the patient and their family (10). The results of one study showed that more than half of those who were exposed to sharp injuries, suffered from psychosocial symptoms after the incident, including stress, anxiety, depression, and about 15% of them required counseling and psychological follow-up (23).

Stigma has been the main element of nurses' experience. Stigma or social stigma is a complex and multi-dimensional phenomenon. Stigma in health care centers is a major barrier to providing health services for patients and personnel with occupational exposure and prevents efforts in diagnosis, treatment and follow up. In a study in Kenya, there was a fear of infection among health care providers as a result of social stigma and discrimination (24). The results of the studies show that fear and stigma among the health care workers due to the scandal caused by exposure to occupational infections can affect providing care for patients (25). By encouraging empathy with staff that have had an occupational exposure and providing an

environment where standard precautions are observed, a positive viewpoint can be made between nurses regarding nursing care (26). The social concepts of stigma lead to hopelessness, suicide, loneliness, and death expectancy. Fear of social stigma, disturbance, frustration and anxiety are among the negative psychological effects of occupational exposures that can affect the medical staff in the future (27).

The lack of support from hospital managers and families has been another virulent experience of health care workers in the emergency department. A study in Iran showed that senior hospital managers, due to executive responsibility and distancing themselves from the clinical care environment, had no experience of injuries caused by sharp and blood-bearing equipment, therefore, the worries and tensions of staff suffering from injuries due to such equipment were not well understood by them (28).

One of the main themes in this research was follow-up after occupational exposure. In a study in India, 66% of occupational injuries were reported during the first hour after the exposure for required follow-up. In several studies, the most important reasons for follow-up reporting has been indicated in some cases, including: dissatisfaction with the follow-up process, unfamiliarity with the reporting and follow-up process, high engagement, lack of risk perception, individual prediction of a low risk infection in the source of injury and complicated bureaucratic process (29). In a study in Iran, it has been shown that after post occupational exposure follow-ups, 15.6% and 12.5% of the cases were prescribed anti-hepatitis vaccine and immunoglobulin and anti-HIV drugs, respectively (6). The results of a study showed that 67% of staff with occupational exposure did not take any medical and therapeutic measures as follow up, and 3% of those who had the result of negative infectious tests were contacted by patients with positive infectious test results, and received both immunoglobulin and vaccine (2). The results of this study showed that the most important cause of contamination of health care workers with blood and infectious discharge of the patient was their carelessness and the nurses initially blamed themselves. However, lack of thinking and concentration during care, lack of safety equipment, and unsafe measures in the clinical ward are mentioned as other causes of occupational exposure.

## Conclusion

To comply with standard precautions and to implement infection control standards, emphasis on training staff and providing instructions is not enough, but in addition to providing the necessary equipment, there is need to strengthen the staff's belief in the necessity of observing this precaution. To achieve this goal, it is suggested that measures be taken to enhance the adaptation of staff to personal protection issues, cognitive approaches, behavioral modification strategies, and the combination of theoretical foundations and educational experiences to enhance the staff's skills. It is necessary that health care professionals, in order to provide better health care

services post occupational exposures, while supporting the managers through follow-up measures, should also distinguish the attitudes of judgment and emotions caused by the stigma from their professional behaviors.

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# The Effectiveness of Self-Encouragement Skills Training on Genital Self-Image in Women with Physical-Motor Handicap (in southeast of Iran)

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## Abstract

The present study aims to determine the effect of training self-encouragement skills on Genital Self-Image in women with a physical-motor handicap. This research is a quasi-experimental study with pre and post-test design by the control group. The statistical population consisted of all married women with a physical-motor handicap in Chaharmahal and Bakhtiari Province in 2016. Then, 50 people were selected using multistage cluster sampling method and divided into two experimental (25 subjects) and control (25 subjects) groups. Data were collected by Female Genital Self-Image Scale (FGSIS). Covariance analysis and repeated measures ANOVA were used to analyze the data collected. The findings indicated that self-encouragement training was effective on the total score of Genital Self-Image by 61% ( $P < 0.05$ ). Therefore, learning the self-encouragement skills can increase self-esteem in people; this leads to a positive body self-image. The higher the self-esteem, the higher will be the individual's satisfaction with life, sex, and ultimately, the closeness between couples.

**Key words:** Genital Self-Image, Self-Encouragement, Physical-Motor Handicap.

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## Introduction

Women's health is often accompanied by many challenges whereby any disturbance in their health condition, negatively affects society (1). Sexual affects all people at all ages and all stages of life and is necessary for responsible parenthood and reproductive health (2). Women with disabilities have also proven that they have a basic need for a close relationship and meeting their sexual needs as much as normal people (3). Nonetheless, there is a separation for people with disabilities in the popular culture, which makes them unable to join the community freely (4). The healthy sexual function and proper marital relationship are the cornerstones of a stable and intimate relationship and considered among the important factors in the physical and psychological health of couples so that the sustainability of the family depends on these relationships (5-7). Several factors can affect the sex life of women with a physical-motor handicap. One of the factors influencing the sex life of women with a physical-motor handicap is having a negative body image and genital self-image. The term body image has two perceptual and attitudinal dimensions. The perceptual component of body image is how to see the size, shape, weight, face, movement, and actions, while the attitudinal component is related to how we feel about these features and how these feelings drive our behavior (8). In fact, a positive body image creates a sense of value in the person, and the mental body image that has undergone any change leads to a change in the sense of value (9). The positive and negative effects of genital self-image can be important in order to preventive health measure (10). The negative genital self-image can lead to negative feelings about the body, which is recognized as a risk factor in psychopathology (11). Since women with a physical-motor handicap are among the vulnerable people, including sexual vulnerability, it is critical to address their problems.

Hence, several approaches have been proposed in order to enrich marital relations and improve the sexual function of women with a handicap. One of these approaches is self-encouragement training. Self-encouragement helps a person feel satisfied with their dedication to the well-being of the community (12). Self-encouragement covers both personal and social goals. The important thing is having positive attitudes towards the surrounding issues. It is while some people are not like this and live with a sense of inadequacy and humiliation. They believe they are not useful. This desperation and discouragement should be treated by increasing self-encouragement, satisfaction and mental health and also meeting the needs of life (13). Self-encouragement strengthens and improves self-confidence and self-awareness, and this is the key to individual development. With self-encouragement, the person feels more helpful to the community. It often has social goals and is more than just being positive; and it's not just denying and suppressing the negative aspects of life. Self-encouragement is paying simultaneous attention to the positive and negative aspects of life (14). There are many unsolved problems regarding the sexual health of disabled women in low and middle income countries (15), which requires appropriate interventions. In addition, some studies showed that psychological interventions have had positive outcomes in the treatment of certain diseases (16-21).

Based on the above, it seems that providing couples with necessary and efficient educational opportunities can help them to resolve the inevitable conflicts of marital life and increase their marital affinity by accepting their strengths and weaknesses as well as positive feelings about themselves and their spouses. Therefore, the present study aims to answer the question of whether self-encouragement skills training will affect the Genital Self-Image of women with a physical-motor handicap?

## Methodology

This is a quasi-experimental study with pre-test and post-test design. The research was conducted using cluster sampling and random sampling methods in the experimental and control groups. Initially, scientific texts related to marriage, physical-motor handicap, self-encouragement and genital self-image were studied. Then, the subjects were selected through multistage cluster sampling based on informed consent and inclusion-exclusion criteria. After that, they were randomly assigned to the experimental and control groups. After both groups completed the questionnaires, the subjects in the experimental group received Schwanke's self-encouragement in 10 sessions of 90 minutes. During this period, the control group did not receive any training. After completing the training course, the questionnaires were again filled in by the two groups. Also, three months after the last intervention session, the experimental and control groups were evaluated using questionnaires. Finally, the data were analyzed by SPSS software to examine the most important descriptive and inferential statistical indices.

The FGSIS questionnaire was used in this study: Herb-nick, et al (22) designed this questionnaire for measuring the genital self-image in women aged 18 to 60 years. The questionnaire has 2 scales of 4 questions and 7 questions, which are graded using the Likert scale (completely agreed, agreed, disagreed, completely disagreed). The scores on the 7-item scale ranged from 7 to 28, and the scores on the 4-item scale ranged from 4 to 16. The higher the score, the more positive is the genital self-image. Based on the factor analysis, the factor loadings of the subjects were 0.62 to 0.88. According to the results, the 4-item scale was better than the 7-item scale for assessing female genital self-image. The results showed all evidence for validity, accuracy, and reliability in a sample of US women. Cronbach's alpha was estimated to be 0.86 for the 4-item scale. However, both versions of this questionnaire can be appropriate for measuring female genital self-image (22). Cronbach's Alpha for the present study was 0.87, which indicates its acceptable reliability.

## Results

At first, demographic information of the sample population was examined, with the results presented following:

The most frequent age in the experimental and control group was related to women with physical-motor handicap aged 30-40 years (40%) and 50-60 years (48%), respectively. In terms of education, the most frequent education level in the experimental group was high school diploma (48%) and the least frequent was an associate degree (12%). Also, the most frequent education level in the control group was related to women with high school diploma (36%), and the least frequent was an associate degree (12%). Regarding the economic status, the most frequent groups of the experimental group were women with moderate economic status (64%), and the least frequent was related to women with weak economic status (4%). In addition, the most frequent groups of the control group were women with moderate economic status (60%), and the least frequent was related to women with weak economic status (4%).

ANCOVA test was used to examine the effect of self-encouragement skills training on the total score of genital self-image. The results are presented in Table 1 (next page):

The results of group membership in Table 1 show that the F ratios of ANCOVA in the total score of Genital Self-Image ( $F = 74.73$ ,  $F = 0.000$ ) are significant ( $P < 0.05$ ). The findings of this table show that self-encouragement training was effective on the total score of Genital Self-Image by 75%.

The repeated measures ANOVA were used to examine the effect of self-encouragement skills training on Genital Self-Image Score. The results are presented in Table 2.

**Table 1: Univariate ANCOVA results on the total score of genital self-image**

Reference	Dependent variable	Sum of squares	Degrees of freedom	Mean of squares	F	Significance level	Impact factor
Group	Genital Self-Image	149.17	1	149.17	74.73	0.001	0.61

**Table 2: The repeated measures ANOVA on genital self-image score**

	Value	F	Degrees of freedom	Error of degrees of freedom	Significance level	Impact factor
Pillai's Trace	0.37	14.35	2	47	0.001	0.37
Wilk's Lambda	0.62	14.35	2	47	0.001	0.37
Hotelling's Trace	0.61	14.35	2	47	0.001	0.37
Roy's largest root	0.61	14.35	2	47	0.001	0.37

**Table 3: Pairwise comparisons for the GSI score in the experimental group**

Stage	Mean difference	Standard deviation	Significance
Pretest and posttest	1	0.24	0.001
Pretest and follow-up	0.22	0.34	0.53
Posttest and follow-up	0.78	0.23	0.002

Based on the amount of Wilk's Lambda coefficient and the significant effect of group interaction and genital self-image ( $P < 0.05$ ), Table 2 shows that the training of self-encouragement skills has caused the scores of the subject's genital self-image in the pre-test, post-test and follow-up stages to be significantly different. In this table, the impact size (37%) indicates that self-encouragement skills had an impact of 37% on the genital self-image of the experimental group.

According to the table above, the mean genital self-image score in pre-test is significantly different from that of post-test ( $P < 0.05$ ). There is also a significant difference between the mean genital self-image score at the posttest and follow-up stages ( $P < 0.05$ ). However, the mean difference between the pre-test and follow-up stages is not significant.

## Discussion and Conclusion

The findings indicated that self-encouragement training was effective on the total score of Genital Self-Image by 61%. Considering that there is little research on negative genital self-image and the training needed to change this attitude, the results of the following research may not directly relate to the subject of this research. However, these studies are generally in line with the records. The findings of Fisch et al. (23) and Nezu et al. (24) are consistent with the present research. Other studies showed that motivation is an effective approach to weight maintenance and can be used as a new therapeutic approach instead of traditional

skill-based programs (25). Also Improvement autonomous (self-determined) motivation is one of the approaches that seem useful for weight loss (26, 27).

In explaining the results of the second main hypothesis, it can be said that body image is an essential element of the personality and self-image of people that affects their psychological life and attitudes. This image can positively or negatively affect the psychological well-being of the individual and serves as a source of positive or negative emotions. If the person's body image is very inconsistent, his/her social and marital relationships, daily functions, interpersonal relationships and family relationships, which are among the most important areas for the quality of life, will be affected. Failure to have a proper genital self-image in some societies may cause the person to not respond fully to the sexual demands of his/her spouse, and this will lead to disagreement or dissatisfaction of both sides. Thus, the individual will prefer to reduce the frequency of sexual activity due to such conflicts or dissatisfaction that cause reluctance or lack of sexual desire. Therefore, self-esteem is one of the most important areas of physical self-confidence. Hence, people with higher self-esteem are more successful in their academic, occupational, family and personal life. It is while low self-esteem leads to dissatisfaction with the body image and causes a lot of pressure on the person to become attractive. Self-confidence seems to be a very important factor in physical dissatisfaction. Women with a negative genital self-image are not happy with their sex organs, they do not have a good mental image of their sex organs, and they often feel embarrassed, ashamed and discontent,

and perhaps, that is why they avoid having sex or do not enjoy enough. The reason for this feeling is that they may think of dissatisfaction with their sex organs during sex. Therefore, women participated in the research sessions, after learning the expression of their emotions and talking skills with husbands, were able to present themselves more favorably and express their needs to their partners and husbands more effectively, and eventually experience a high level of self-esteem. The more sympathetic = the couple are = the higher will be their satisfaction with life, self-esteem, and positive self-image. On the contrary, the further they are from each other, their self-confidence and positive self-image also reduces. The women participated in the present research sessions raised their intimacy in relationships by expressing their deepest feelings, dreams, desires, anxieties, and joys to their husbands. More importantly, intimacy involves self-awareness and addressing the inner matters. The women, with their knowledge of themselves and their needs as well as their husband, were able to experience a higher level of self-confidence and a positive body image in their marital life. Training Self-Encouragement Skills can improve Genital Self-Image in Women with Physical-Motor Handicap.

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# A comparative study on the effects of raisin's extract and fluoxetine on depression symptoms in mice

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## Abstract

Depression is the most commonly diagnosed psychiatric disorder that has recently been increased. Patients continuously use antidepressants, especially selective serotonin reuptake inhibitors. The goal of this study was comparing the effects of raisin's extract and fluoxetine on depression symptoms in mice. Sixty female mice in the weight range of 25 to 30 g were divided into six groups of control, depression, fluoxetine (1.2 mg/kg) and 50, 100, and 200 mg/kg of extract. All groups, except for the control group, received intraperitoneal injection of 0.4 mg/kg tetrabenazine to create depression. After last dose, all groups were evaluated using forced swim test and tail suspension test. Immobility time was measured as depression index. Data were analyzed using one-way analysis of variance and Tukey test. Results showed that raisin in 100 and 200 mg/kg doses increased mobility time and movement activity of animal significantly in proportion to control and fluoxetine groups ( $p < 0.05$ ) which shows depression reduction. Also, movement activities of these doses were increased significantly in proportion to fluoxetine group. Therefore, raisin's hydro alcoholic extract in 100 and 200 mg/kg doses can be a good replacement for fluoxetine to reduce depression symptoms.

**Key words:** depression, raisin extract, fluoxetine, mice

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## Introduction

People experience a wide range of mood situations, and show also various emotional appearances. One of the common appearances is depression (Kaplan et al. 2014). Researches have shown that depression is related to abnormalities in some neurotransmitters of the brain, including serotonin and norepinephrine. Antidepressants are the most common medications in psychiatry (Berietzke et al. 2012).

Selective serotonin reuptake inhibitors are from items which increase the amount of serotonin in the brain to maintain a mental balance and are followed with a sense of calm. Serotonin is a neurotransmitter which, upon release, returns to the neuron presynaptic terminals. Fluoxetine (Prozac) is one of the famous serotonin reuptake inhibitors. The mechanism of fluoxetine activity is increase in serotonin level in brain which is done by preventing serotonin reuptake into presynaptic terminals and therefore the amount of serotonin will be increased in brain (Stroud. 2012). Fluoxetine, such as many other drugs has side effects which are Nausea, diarrhea, nervousness, insomnia, and sexual problems such as decreased sexual desire and orgasm. The late concern about using fluoxetine during pregnancy is probable risk of heart abnormalities in the baby (Berietzke et al. 2012).

Nowadays, considering side effects of chemical drugs, the excessive cost of these drugs, reduced acceptability, and also the general eagerness to use herbal medicines, diversity of these drugs and their negligible side effects, researchers tend to study medicinal plants (Abdullahzadeh et al. 2014).

Raisin is a dried fruit which is obtained from drying grape under sunlight. This dried fruit contains high amounts of carbohydrate, polyphenol and essential fatty acids (Samah et al. 2012). Grape contains various chemical

compounds such as catechin, procyanidine, anthocyanin, vidin, epicatechin, and acetylbenic derivatives (Iriti et al. 2006, Mukesh. 2009).

Polyphenol compounds of the grape seed extract stimulate endothelial cells of the blood vessels and improve migraine and prevent heart attacks (Harshal et al. 2011). Considering the prevalence of depression and lack of study about the effects of raisin on reducing depression, this research was carried out to study raisin's effects on reducing depression symptoms.

## Materials and method

Sixty female mice in the weight range of 25 to 30g were divided into six groups with 10 mice in each group:

- Control group did not receive any drug
- Depression group received tetrabenazine (0.4 mg/kg) to enforce depression
- Fluoxetine group received 1.2 mg/kg of drug after enforcing depression
- Three experimental groups which received 50, 100, and 200 mg/kg of raisin extract intraperitoneal after enforcing depression.

Animals were kept under similar condition (free access to food and water 12:12 hours photoperiod,  $23\pm 2^{\circ}\text{C}$  temperature and 60% humidity in standard cages made of polycarbonate with a stainless steel lattice ceiling) for two weeks to adapt to environment. Cages floors were covered by sawdust which was changing every two days. All experiments were done from 9 to 17 o'clock. Ethical treatment were observed based on the Brazilian ethics guidelines for animal researches (Animal Science Researches Committee of the Vale do Paraiba University), which was approved by the University's Ethics Committee: code IR.IAU.NAJAFABAD.REC.1396.43. To prepare the hydro alcoholic extract, fruits were dried and then powdered by mill. 200 mg of obtained powder was poured in a sterilized erlen and 40cc of ethylic alcohol was added to it and was kept at room temperature. After 72 hours, erlen contents were filtered using whatman paper and desired doses were prepared.

In this study, fluoxetine (1.2 mg/kg) was prepared from Aria Drug Company and tetrabenazine (0.4 mg/kg) was prepared from Day Darou Salamat Company.

All drugs and extracts were dissolved in normal saline (0.9% physiological serum) and injected intraperitoneally in a given volumes. To evaluate the depression, forced swim test and tail suspension test were used. In suspension test, metal bases with 70cm height plus 50 cm ropes between two bases were used. Mice tails were tied up to this rope and the animal was hanged from tail, then, test was begun with a severe movement of the mouse. The time which animal was motionless, inactive and unresponsive was considered as immobility time. Total suspension time was six minutes which first two minutes was considered for adaption and immobility in next four minutes was measured by chronometer in seconds (Sun. 2004).

In forced swimming test, immobility time was used as depression whereas decrease in it was recorded as anti-depression effect. Mice, after injections, were placed separately in containers ( $25 \times 12 \times 8$ ) containing water at a temperature of  $25^{\circ}\text{C}$ . Conventionally, lack of movement of the legs was considered as immobile time. Total test time was six minutes which first two minutes was considered for adaption and swimming and immobility in next four minutes were measured by chronometer in seconds. Swimming was active movements of animal legs and circling around the column. In both tests, all variables were recorded by one person which was not aware of samples groups (Potdar and Kibile. 2011).

Obtained data were analyzed at two descriptive and inferential levels. Average and standard deviation were calculated in descriptive level whereas one way variance analysis plus Tukey test were used for inferential. Data were analyzed using SPSS 22 program.

## Results

### **The effect of hydro alcoholic extract of raisin's extract and fluoxetine on depression symptoms during movement and move less time in the tail suspension test**

The results of this study showed that prescription of 100 and 200 mg/kg extracts leads to increase movement and decrease move less time in tail suspension test (Figure 1 and 2).

### **The effect of hydro alcoholic extract of raisin's extract and fluoxetine on depression symptoms during movement and move less time in the forced swimming test**

The results of this study showed that prescription of 100 and 200 mg/kg extracts leads to increase movement time in subjects (Figure 3).

The time of move less shows significant effect of extract on reducing the depression in 100 and 200 mg/kg (Figure 4).

Obtained data were analyzed statistically and results are presented in Table 1.

Raisin extract in 100 and 200 mg/kg doses before suspension test (50 minutes) increased mobility time (in seconds) in proportion to depression and control groups ( $p < 0.01$ ). Also, fluoxetine increased mobility time (in seconds) in proportion to depression and control groups ( $p < 0.01$ ).

Extract in 100 and 200 mg/kg doses reduced immobility time significantly ( $p < 0.01$ ) in proportion to depressed and control groups. Also, fluoxetine reduced immobility time significantly ( $p < 0.01$ ) in proportion to depressed and control groups.

Figure 1: Time of movement in the tail suspension test in Control, Depression, Fluoxetine and three experimental groups

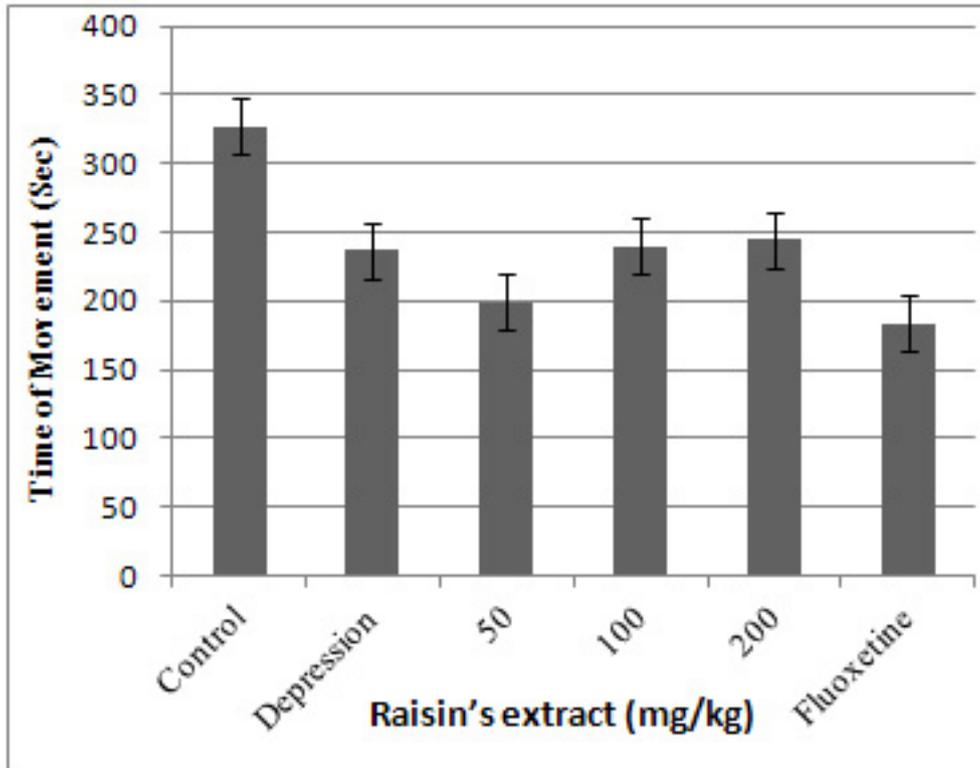
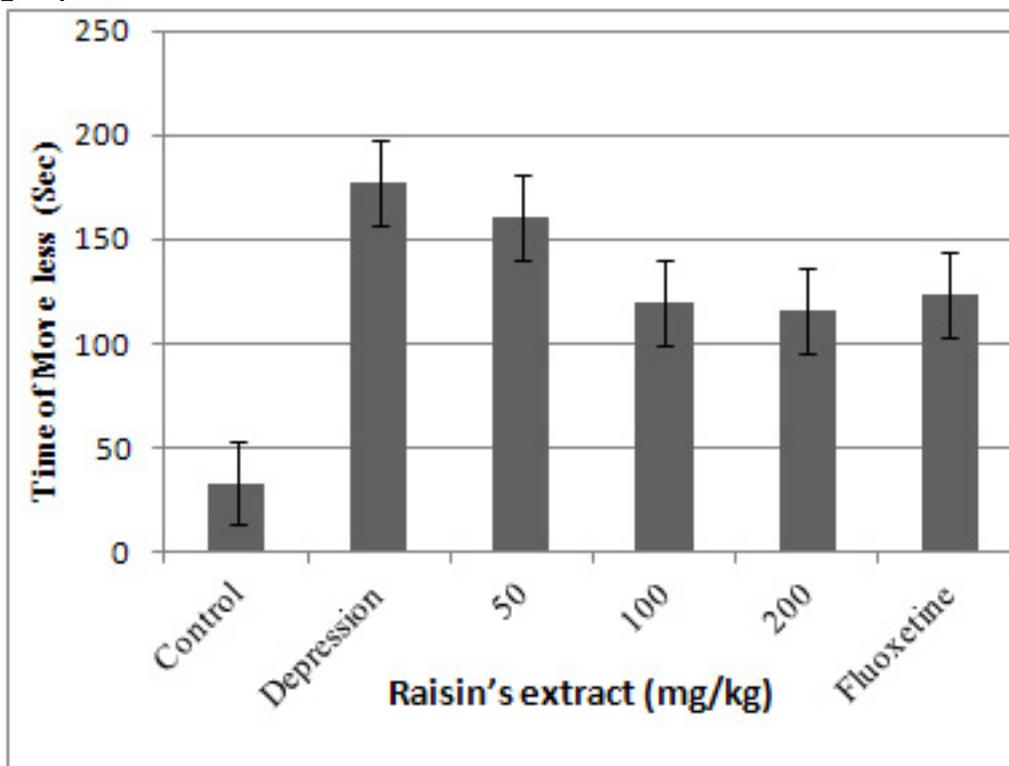
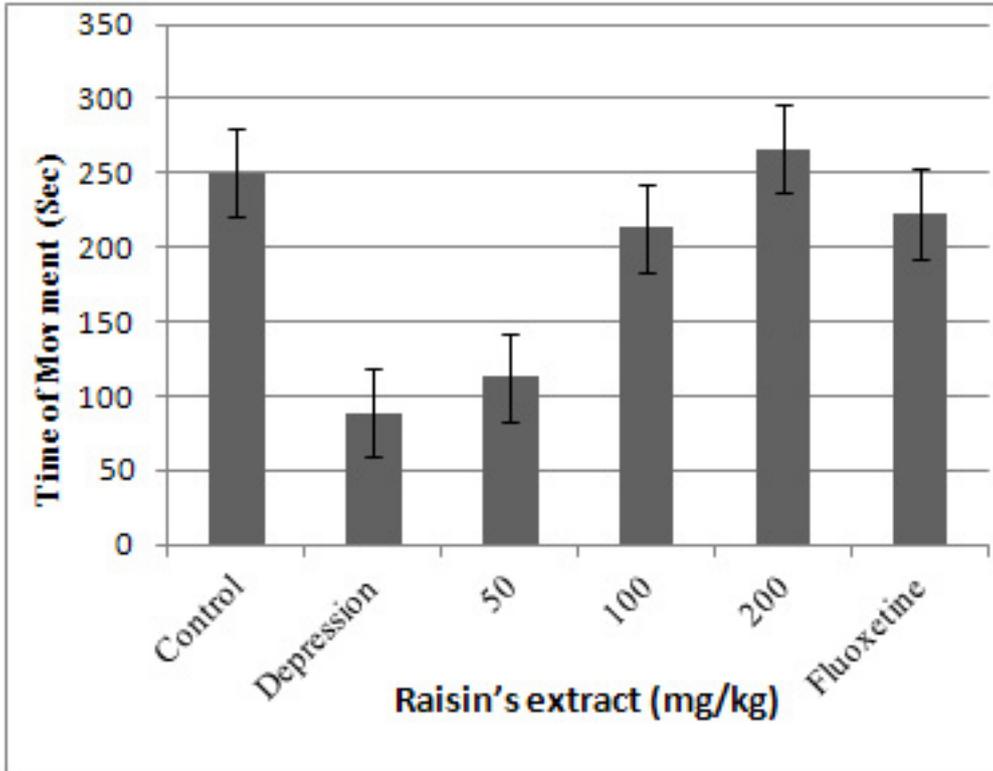


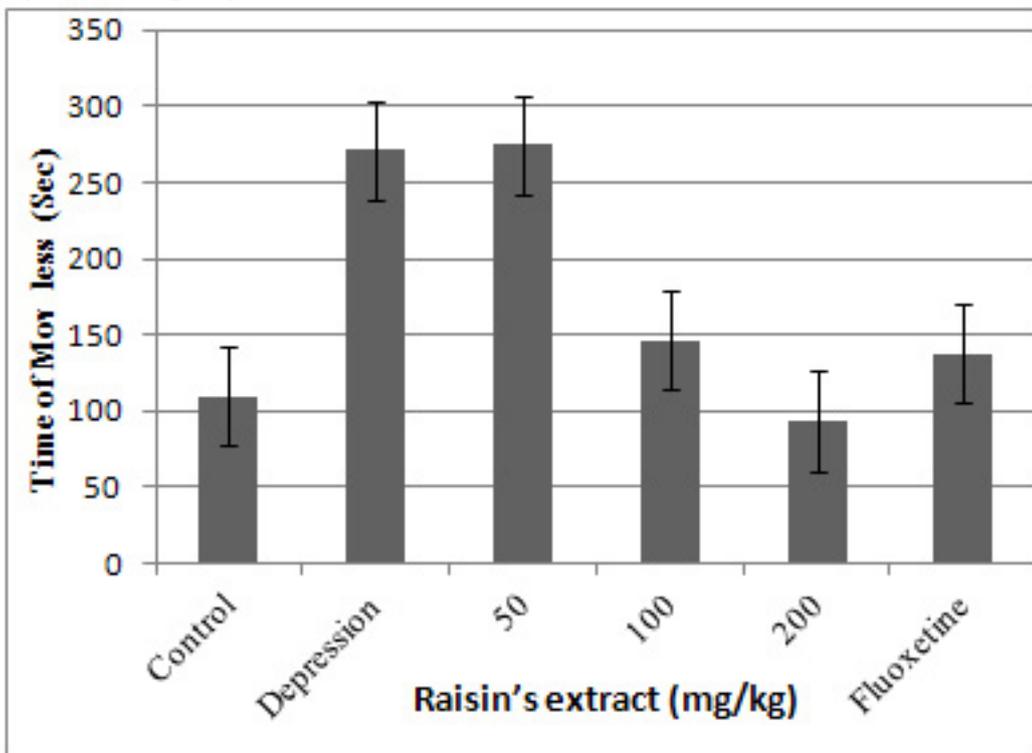
Figure 2: Time of move less in the tail suspension test in Control, Depression, Fluoxetine and three experimental groups



**Figure 3: Time of movement in the forced swimming test in Control, Depression, Fluoxetine and three experimental groups**



**Figure 4: Time of move less in the forced swimming test in Control, Depression, Fluoxetine and three experimental groups**



**Table 1: Average and standard deviation of variables**

	Suspension test (movement)		Suspension test (move less)		swimming test (movement)		swimming test (move less)	
	Average	Standard deviation	Average	Standard deviation	Average	Standard deviation	Average	Standard deviation
<b>Fluoxetine</b>	236.3	18.89	123.7	18.89	222.4	29.69	137.6	29.69
<b>Depressed</b>	183.1	27.83	176.9	27.83	89.1	7.26	270.9	7.26
<b>Control</b>	326.7	27.03	33.3	27.02	250.3	38.67	109.7	38.67
<b>50mg/kg</b>	199.3	28.39	160.7	28.39	112.6	42.47	274.4	42.47
<b>100mg/kg</b>	239.7	30.76	120	30.95	213.3	11.4	146.7	11.4
<b>200mg/kg</b>	244.2	47.41	115.8	47.41	266.7	7.1	93.3	7.1

## Discussion

In the current study, the effects of raisin extract and fluoxetine were compared on reducing depression symptoms of animal model by forced swim test and tail suspension test. Results showed that fluoxetine reduced immobility time of mice in tests significantly. Since fluoxetine controls serotonin reduction, it can explain anti depression effect because the mechanism of fluoxetine is increasing serotonin level in brain via preventing reuptake of it to pre-synaptic terminals. With this, fluoxetine can overcome symptoms of depression by correcting serotonin disorder in the brain (Stroud. 2012).

In pathology, decrease in function of some neurotransmitters such as serotonin, epinephrine and dopamine leads to depression and almost all chemical drugs with anti-depression properties increase function of at least one of these chemical messengers (Dalvand et al. 2016). It is important that serotonin reuptake inhibitors, including fluoxetine, are the most widely used antidepressant drug (Berietzke et al. 2012). It should be said that dopamine receptors placed pre-synaptic on the dopamine terminals and inhibition of them leads to releasing dopamine as an effective neurotransmitter that can decrease depression severity (Ebrahimi et al. 2017).

On the whole, results of this study showed that probably raisin's effect on immobility time of mice in suspension and forced swimming tests must be a pre-synapse effect due to a change in serotonin reuptake. Another probability is that raisin can be effective via other anti-depression routes. Since in this test, immobility was reduced and movement was increased, the extract has shown anti-depression effects. By more studies raisin's extract can be proposed in place of fluoxetine to reduce its chemical side effects.

## Conclusion

According to results, raisin's extract could reduce depression; but to prove this, more studies are necessary. Therefore, we propose more studies on wider range of doses and also comparing the extract with other anti-depressant drugs.

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# Antimicrobial Effects of Hydroxytyrosol Extracted From Olive Leaves, on Propionibacterium Acnes

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## Abstract

**Introduction:** The olive tree consists of twenty species that belong to the olive genus (*Olea*). These trees are always green and have small, seamless leaves that are facing each other. Acne vulgaris is one of the most common skin diseases and the most common cause for referral of patients to dermatologists. *Propionibacterium acnes* is a gram-positive bacteria, anaerobic rod that is found on the human skin surface as a natural flora, causing acne. It can also cause chronic blepharitis and endophthalmitis in the eye.

### Materials and Methods:

Standard well assay method in Mueller-Hinton agar based on CLSI protocol was used to evaluate the zone of inhibition of different hydroxytyrosol concentrations. Then the result of this assay was compared with standard antibiogram test by antibiotics choice for acne treatment such as Clindamycin, Tetracycline and Erythromycin.

To determine MIC and MBC, a sterile microplate was first prepared from hydroxytyrosol 20 dilutions consecutively from 10 fold serial dilution in sterilized Mueller-Hinton Broth from 200mg/ml until 0.00038mg/ml. Standard suspension of *Propionibacterium acnes* opposite  $5 \times 10^5$  cfu/ml was prepared and equally added to the tubes containing different dilutions of hydroxytyrosol.

**Findings:** Until the fifth dilution, growth was observed; the concentration of 12.5 mg / ml of the tested compound had the minimum bactericidal concentration. MBC converted unit to 12500 µg / ml.

In the 6th dilution (6.25 mg/ml) growth was observed, therefore this concentration was introduced as minimum inhibitory concentration (MIC) and the converted unit to 6250 µg / ml.

**Conclusion:** In this study, it was found that hydroxytyrosol has an antibacterial effect against *Propionibacterium acnes*. But it is weaker than existing standard antibiotics.

**Key words:** Olives, Hydroxytyrosol, Acne vulgaris, *Propionibacterium acnes*

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## Introduction and Importance of Research

(Olive) and scientific name *Olea europaea* contains approximately twenty species of small trees of the olive family and are found in the ancient world of the Mediterranean Sea, North Africa, Southeast Asia, North to South China, Scotland and Eastern Australia so has a wide dispersion. They are always green and have small, seamless leaves that are facing each other. In Syria, where olive oil has always been important for the economy of its inhabitants, it can be concluded that Syria has been the birthplace of olive. Olive contains a large amount of unsaturated oil, that contains plant chemicals that reduce cholesterol and the risk of cancer, and it contains a lot of antioxidants. Its durability and shelf life are higher than other oils, and it can even be frozen. (1)

Hydroxytyrosol, the scientific name of 2- (3,4-Dihydroxyphenyl) -ethanol, is a phenylethanoid that is made in a laboratory environment. In nature, there is olive oil and olive seed. It has been shown in laboratory studies that hydroxytyrosol prevents platelet aggregation. It also prevents the formation of thromboxane b2 (Thromboxane B2) (a non-active Thromboxane A2 metabolite) (2).

In the early studies, the antioxidant and anti-bacterial effects have been proven (3).

In rat studies, low hydroxytyrosol has been shown to reduce the effects of cigarette oxidative stress (4).

In some studies, the effect of anti-UV hydroxytyrosol on the skin has been proven (5).

*Propionibacterium acnes* is a gram-positive bacteria that is an anaerobic form found on the human skin surface as a natural flora, and causes acne. It can also cause chronic blepharitis and endophthalmitis in the eye (6).

Acne vulgaris is one of the most common skin diseases and is the most common cause of referral of patients to dermatologists. It usually begins at the same time as puberty. In the division of skin diseases, acne is one of the diseases of the skin's appendages, namely, hair. The root of the hair is located and grown in the localized canal space called the hair follicle. On the other hand, fat glands, as one of the other skin components, discharge their secretions into the hair follicle, which move upwards and spread on the skin surface. Acne treatment costs a lot at a high cost per day, causing many side effects to the skin, causing scars, wrinkles, and bad skin, which reduces self-confidence, and can lead to depression and even suicide. In some cases, acne can be found in the follicle known as acne fulminans and can be life threatening (7).

An important part of anti-*Propionibacterium acnes* antibiotic therapy is clindamycin, tetracyclines, erythromycin, metronidazole, nadifloxin and dapsone. In some cases, *Propionibacterium acnes* have been shown to be resistant to some of the drugs used, and some drugs are associated with complications that are painful for the patient (8).

Antibiotic resistance, the pathogenic microbes used to fight antibiotics, resist gene mutations in relation to these drugs and create new generations that cannot be combated. One of the most important factors in this type of drug resistance is the use of antibiotics arbitrarily or excessively. This phenomenon looks at the whole of the human society, which has put it at the risk of terrorism. The resistance of bacteria to antibiotics is one of the greatest challenges that threaten the health of the modern age (9).

Based on the above, finding new antibiotic treatments for acne is essential. It is also necessary to find out more about antibacterial hydroxytyrosol effects and its effect, by way of doing basic research, which is the basis for research on humans. Also, using the information obtained from this study, it opens the way for the creation of herbs and ointments of plant origin that have antibacterial and sun protective effects.

The purpose of this study was to determine the effect of hydroxytyrosol on bacteria *Propionibacterium acnes*. Using the results of this study, a way to build new antibiotics may be realised.

## Materials and Methods

This research was a descriptive cross-sectional study in which the studied population of *Propionibacterium acnes* was conducted in the Department of Microbiology of Yasuj University of Medical Sciences. The data gathering tool was a data registration form, direct observation, and culture results, and the research variables (MIC-MBC) were the no-growth field.

### Determination of zone of inhibition

CLSI protocol was used to determine ZOI by different concentrations of hydroxytyrosol. Six 10 fold serial dilutions from hydroxytyrosol were prepared. The concentrations prepared included 100, 50, 25, 12.5, 6.25, and 3.125 mg/ml. With the well method antibiogram test was performed on different concentrations of hydroxytyrosol on the Mueller-Hinton agar and results were compared with standard antibiograms. Standard antibiotics were included: Clindamycin, Tetracyclin and Erythromycin. The test was repeated three times.

### Determination of MIC and MBC

To determine MIC and MBC, a sterile flask tube was first prepared from hydroxytyrosol 20 dilution consecutively 1: 10 in sterilized Mueller-Hinton broth. Microplate dilution was then prepared from *Propionibacterium acnes* bacteria to the  $5 \times 10^5$  cfu/ml and equally added to the wells containing different dilutions of hydroxytyrosol. The wells were then incubated in a 37 ° C for 24 hours. After 24 hours, each well containing hydroxytyrosol and a bacterium was considered as ELISA reader at wavelength 620 nm wells that were not turbidity cultured on blood agar and kept in 37° C for 24 hours. After incubation time, bacterial growth was checked. At least the concentration of hydroxytyrosol that inhibits growth did not produce opacity, but had grown on the associated agar base, as the MIC and the least concentration causing the loss of 99.9% of the bacteria, or more in the well did not increase turbidity and did not develop on related agar. MBC was considered.

## Findings

Microplate dilution method was used to determine MIC and MBC with 10 fold 20 serial dilutions from 200 mg/ml until 0.00038mg/ml concentrations. The result showed that hydroxytyrosol in 6.25 mg/ml concentration contained MIC and at a concentration of 12.5 mg/ml showed MBC.

Results of diameter of the zone of inhibition in the well assay antibiogram at concentrations of 100mg/ml , 50 mg/ml, 25mg/ml, 12.5mg/ml , 6.25mg/ml and 3.125mg/ml were 25mm,21mm,19mm,16mm,13mm and 10mm respectively.

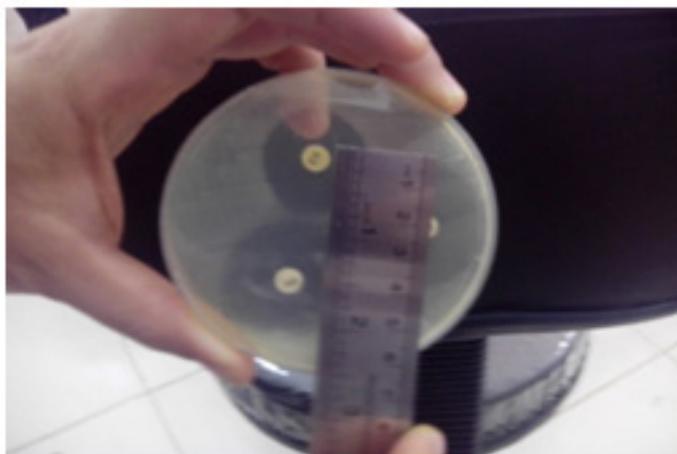
**Table 1: Diameter of zone of inhibition for different concentration of hydroxytyrosol (mm).**

Concentrations of hydroxytyrosol (mg/ml)	Zone of Inhibition (mm)
100	25
50	21
25	19
12.5	16
6.25	13
3.125	10

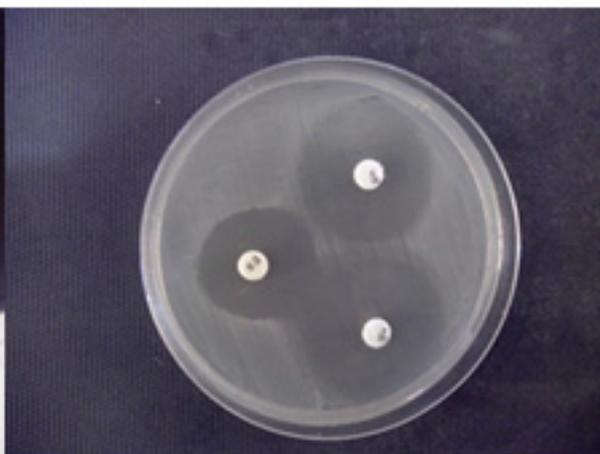
**Table 2: Diameter of zone of inhibition for standard antibiotics (mm).**

Antibiotics	The diameter of ZOI (mm)
Clindamycin (CC)	37
Erythromycin (E)	32
Tetracycline (TE)	29

**Photo – 1**



**Photo - 2**



## Discussion and Conclusion

In this study, it was found that hydroxytyrosol has an antibacterial effect against *Propionibacterium acnes*. Until the fifth dilution of growth was observed, the concentration of 12.5 mg / ml of the tested compound had minimum bactericidal concentration. The MBC was calculated at 12500 µg / ml at unit conversion.

From dilution 6, growth was observed, i.e. a concentration of 6.25 mg / ml was minimum inhibitory concentration and converted unit to 6250 µg / ml.

Pio Maria Furneri, et al in a study titled Antimycoplasmal Activity of Hydroxytyrosol said: "Hydroxytyrosol has an antibacterial effect on twelve species of *Mycoplasma hominis* and two species of *Mycoplasma fermentans* and one species of *Mycoplasma pneumoniae*." The MIC for these three species was 0.03, 0.25 and 0.5 µg / ml, respectively. In this study, the drug was safe and sufficient for use as an antibiotic (13).

According to this result and in comparison with the results of the present study, the effect of hydroxytyrosol on *Propionibacterium acnes* is less than *Mycoplasma hominis*, *Mycoplasma fermentans* and *Mycoplasma pneumoniae*.

**Table 3**

Antibiotic	MIC µg/ml
erythromycin	0.01 to 0.015
clindamycin	0.12 to 0.015
tetracyclin	0.12 to 0.015
Hydroxytyrosol	6250

In Wang WL et al's study entitled "Susceptibility of *Propionibacterium acnes* to Seventeen Antibiotics": the MIC was calculated for *Propionibacterium* for Clindamycin 0.015 to 0.12, for erythromycin 0.01 to 0.015, and 0.015 to 0.01 for tetracycline (14).

According to the results of this study, hydroxytyrosol has a weaker anti-microbial effect than standard antibiotics against *Propionibacterium acnes*.

Bisignano et al, in a study titled on the in vitro antimicrobial activity of Oleuropein (OL) and hydroxytyrosol (HT) OL and HT showed good antibacterial activity in the laboratory environment. But there is not enough information on human bacteria. The bacteria in this study included *Haemophilus influenzae*, *Moraxella catarrhalis*, *Salmonella typhi*, *Vibrio parahaemolyticus*, and *Staphylococcus aureus*. In this study, the MIC for hydroxytyrosol was measured for standard strains between 0.24 µg / ml and 7.85 µg / ml, and for clinical strains between 0.97 µg / ml and 31.25 µg / ml. This value was much lower for Oleuropin, for standard strains between 31.25 µg / ml and 250 µg / ml, and for clinical strains between 62.5 µg / ml and 500 µg / ml (3).

In the above study, it was found that hydroxytyrosol has much more antibacterial activity than Oleuropein. Clinical strains also had more bacterial resistance than standard strains.

Comparing the above research with the present study, the antibacterial effect of hydroxytyrosol on *Propionibacterium acnes* is much less than that of *Haemophilus influenzae*, *Moraxella catarrhalis*, *Salmonella typhi*, *Vibrio parahaemolyticus* and *Staphylococcus aureus*.

**Table 4:**

Bacteria	MIC µg/ml
<i>Mycoplasma hominis</i>	0.03
<i>Mycoplasma fermentans</i>	0.25
<i>Mycoplasma pneumoniae</i>	0.5
<i>Propionibacterium acnes</i>	6250

**Table 5**

Bacteria	MIC µg/ml
Standard bacteria	7.85 _ 0.24
Clinical bacteria	31.25 _ 0.97
<i>Propionibacterium acnes</i>	6250

Richard Kimura et al in A Novel Borinic Acid Ester with Antibacterial Activity Against *Propionibacterium acnes* stated that: ANO 128 is a new bionic acid that has a large antibacterial effect on Gram positive bacteria. In our study, it was found that this substance has an antibacterial effect against *Propionibacterium acnes*. MIC = 2 µg / mL. (15) Compared to the current study, hydroxytyrosol with MIC = 6250 µg / mL is much weaker than ANO 128 with MIC = 2 µg / mL.

Hardy et al. in *Susceptibility of Contemporary Propionibacterium acnes to Fusidic Acid* stated: Fusidic acid is a new substance tested for bone and joint infections. In this study, MIC was measured for 51 µg / mL *Propionibacterium* species between 0.5 and 1 µg / mL. As a result, we conclude that fusidic acid is effective against *Propionibacterium acnes* as it affects *Staphylococcus aureus* infection. (16)

Compared to the current study, hydroxytyrosol with MIC = 6250 µg / mL is much weaker than fusidic acid with a MIC of between 0.5 and 1 µg / mL.

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# The Epidemiology of Sudden Cardiac Death; a Forensic Autopsy Study in Iran 2013-2016

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## Abstract

**Background:** Sudden cardiac death is the most common and deadliest manifestation of coronary artery disease that causes more deaths than any other cause each year. This study has been conducted with regard to the highly fatal and the high prevalence and the lack of adequate information in this area in our country.

**Objective:** To determine the epidemiological findings of sudden cardiac death in Tehran, Iran from April 2013 to April 2016.

**Materials and Methods:** In this descriptive-analytic cross-sectional study, referring to the forensic archives of Tehran Legal Medicine Organization, information was collected based on a researcher-made questionnaire from patients who died of natural symptoms within 24 hours of onset of symptoms. Using statistical software SPSS V16 data was subjected to descriptive and analytical reviews.

**Results:** Findings show that about 77% of male subjects with an average age of 58.05 years (SD=13.56), 41.5% of cases in the age range of 50 to 65 years, were generally free or retired from their job (47.8% and 25.3%). The most common cause of death was "heart attack" (more than 99%) and mainly the location of death was prehospital (50%), which occurred in 82% of cases during rest or during normal activity, and mainly during the initial hour (60%) and the most common time of death was 6 to 12 in the morning

(39.6%). The mean heart weight was 380 g  $\pm$ 67.42, pulmonary fibrosis was 65%, and hyperemia was seen in 47%. The most common site of coronary involvement was LAD + RCA (77%).

**Conclusion:** Considering the rapid growth of sudden cardiac deaths over a three-year period, and considering the difference in the results of this research with similar research abroad, the need for the attention of clinicians to these differences could be helpful in the management of such valuable patients.

**Key words:** Epidemiology, Forensic, Autopsy, Sudden death, Sudden cardiac death

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## Introduction

Sudden Cardiac Death (SCD) is defined as a sudden, unexpected death with a heart origin with or without an existing heart problem that occurs shortly after the onset of symptoms (up to an hour) (3-1). Ischemic heart disease is the most common cause of natural sudden death. Major causes of ischemic heart disease include coronary artery atherosclerosis, hypertensive heart disease, aortic valve disease, coronary artery disease, cardiomyopathy, congenital heart disease, and artery disease, such as polyarthritis (4). The prevalence of SCD in several studies in the United States, China, Ireland and the Netherlands has been estimated at a range of 50-100 per 100,000 populations (5-10).

Despite the decrease in the ischemic heart disease mortality, unfortunately the incidence of sudden death has increased and in 50% of cardiovascular patients, it is the first manifestation of the disease (11-12). Unfortunately, the majority of people with this disease have no symptoms and are not in the high-risk group. In societies that have extensive training for the recovery of heart disease patients, only 8% of hospitalized patients are alive (13) and since more than 90% of patients die before they reach the hospital, recognizing high-risk patients and prevention measures is very important (1).

One of the most important issues that has always been in the mindset of clinical professionals, is to know the cause of death in cases of sudden death. This is not possible for clinicians in most cases. On the other hand, even with a complete autopsy, sometimes it is difficult or impossible to understand the exact cause of death in some cases of sudden death (white autopsies) (14-14). Unfortunately, despite the advancement of medical technology, our knowledge of the causes and risk factors of sudden

cardiac death, unlike other atherosclerotic diseases, is very limited (16). In our country, limited studies have been conducted on this disease. Due to referral of many dead people fewer than 24 hours from the onset of symptoms to the Legal Medicine Organization (LMO), the information in the forensic record may seem to be an authoritative and generalizable source for the disease.

## Materials and Methods

The present study is a cross-sectional, descriptive-analytic retrospective study. The Statistical population was all cases of sudden cardiac deaths referred to the LMO and the samples, of all the cases of sudden cardiac deaths were sent to LMO during the period between April 2013 to April 2016.

Sampling method was census and all samples were entered according to inclusion and exclusion criteria. Inclusion criteria were symptom onset up to one hour, and death because of cardiac causes and exclusion criteria was including suspicious, non-cardiac and abnormal deaths (such as poisoning, accident, stroke, acute pulmonary embolism, etc.). Data were collected in a researcher-made questionnaire with two parts. 1) Demographic information and individual history. 2) Autopsy findings. In all of the cases, autopsy was carried out by classical method and all necessary data including heart weight, fibrosis, hyperemia, coronary artery involvement were extracted. Eventually, 2182 sudden cardiac death during 2013 to 2016 were reviewed. All data were collected in a researcher-made questionnaire. SPSS V16 software was used for mean, median, mode, standard deviations, and also Pearson chi square test or Fishers exact test for analysis of mean differences or ratios. In analytical cases, P value less than 0.05 was considered significant. This study, was in keeping with the Helsinki Code of Ethics.

## Results

A total of 2,182 sudden cardiac deaths were referred to LMO during the three years 2013 to 2016. An increase in the annual trend of sudden cardiac death was seen. That means from 593 people (27.2%) in 2013, 793 people (33.4%) in 2014 and 861 people (39.5%) increase in 2015, which was statistically significant ( $0.04 > P$ ) (Table 1)

**Table 1: Annual trend of sudden cardiac death in 3 years 2013-6**

Year	Frequency	Percent	P value
2013	593	27.2	
2014	728	33.4	0.04
2015	861	39.5	
<b>Total</b>	<b>2182</b>	<b>100</b>	

### A) Demographic Findings

Out of 2,182 sudden cardiac deaths during the three years 2013 to 2016, there were 1,678 men (76.9%) and 504 women (23.1%) (Ratio 3.2: 1). The mean age of the samples was 58 years with a standard deviation of 13.56, in the range of 23-90 years old. Table 2 reviews the frequency based on age groups. As seen from the 2,182 cases, the highest frequency was observed in the age group of 50-65 years (41.5%, 906 = n).

**Table 2: Frequency of sudden cardiac death in 3 years 2013-6 based on age groups**

Age groups	Frequency	Percent	P value
20-34	48	2.2	
35-49	527	24.2	
50-64	906	41.5	.000
65-80	574	26.3	
80<	127	5.8	
Total	2182	100	

In Table 3 it can be seen the data about the cases' occupation, place of death, cause of death, the time and duration of onset of symptoms to death, and physical conditions and activity.

**Table 3: Frequency of sudden cardiac death in 3 years 2013-6 based on demographic variables**

Variable	Frequency	Percent	P value
<b>Occupation</b>			
Self employed	1047	48	
Employee	297	13.6	
Retired	552	25.3	.000
Housewife	225	10.3	
Student	61	2.8	
<b>Place of death</b>			
Out of the hospital	1090	50	
At the entrance to the hospital	316	14.5	.000
Hospitalized in hospital	776	35.6	
<b>Cause of death</b>			
Merely a heart attack	1681	77	
Myocardial infarction and diabetes	199	9.1	.000
Myocardial infarction and kidney failure	233	10.6	
Myocardial infarction and hypertension	52	2.4	
Pulmonary heart disease	18	.8	
<b>Duration of symptoms until death</b>			
Less than 1 hour	1224	59.1	
Less than 3 hours	374	17.2	
Less than 6 hours	278	12.7	.000
Less than 12 hours	207	9.5	
Within 24 hours	99	4.5	
<b>Conditions and physical activity</b>			
While sleeping	79	3.6	
During the break	921	42.2	
During normal activity	860	39.4	.000
During moderate exercise	274	12.6	
During extreme sports	48	2.2	
<b>Total</b>	<b>2182</b>	<b>100</b>	

### B) Autopsy findings

The mean heart weight was  $67.42 \pm 380.79$  g, with a median of 410 g in the range of 330 to 730 g. After the classic dissection and then the transverse, the findings of the existence of fibrosis and hyperemia were carefully investigated. 763 cases (35%) had no fibrosis and 929 (42.6%) cases had no hyperemia. Regarding the status of coronary artery involvement, 153 cases (7.2%) had no problem. The most cases of fibrosis were seen in left ventricular (523(243%)) and the interventricular wall (291(13.3%)). The highest incidence of coronary arteries involvement was in both LAD & RCA (1680(7780%)). The single RCA (14(2.2%)) and single LAD (48(.9%)) involvement were the least. Table 4 deals with these findings.

**Table 4: Frequency of sudden cardiac death in 3 years 2013-6 based on the presence of fibrosis, hyperemia and coronary artery involvement**

Variable	Frequency	Percent	P value
<b>Presence of fibrosis</b>			
Left ventricle	523	24	
Right ventricle	137	6.3	
Both ventricles	206	9.4	.000
Interventricular wall	291	13.3	
Interventricular and left ventricular wall	203	9.3	
Papillary	59	2.7	
Could not be seen	763	35	
<b>Hyperemia</b>			
Left ventricle	465	21.3	
Right ventricle	83	3.8	
Both ventricles	52	2.4	.000
Interventricular wall	308	14.1	
Interventricular and left ventricular wall	297	3.6	
Interventricular and right ventricle	48	2.2	
Could not be seen	929	41.6	
<b>Coronary involvement</b>			
LAD	48	2.2	
RCA	14	.6	
LAD+RCA	1680	77	.000
3 Vessels	287	13.2	
Could not be seen	153	7.2	
<b>Total</b>	<b>2182</b>	<b>100</b>	

## Conclusion and Discussion

In this study, information was obtained by the demographic findings of corpses sent to Tehran LMO in the three years 2013, 2014 and 2015, which identified a sudden cardiac death as a cause of death. During these three years, there was an increasing trend in sudden cardiac death ( $P < 0.000$ ). There are several causes that can be mentioned; improvement in diagnostic methods, physicians' preference to refer bodies to forensic medicine in such situations, increased burden of heart disease in the community, increase in severity of heart disease, lack of therapeutic response, and so on. According to the study by Cathritiss et al in 2016 at the Atomic Clinic of Athens and Harvard College and the Mayo College in the United States, 50% of sudden deaths were due to sudden cardiac death, and this ratio remained unchanged despite a general decline in cardiac mortality (17). According to the study by Fabian Sachs Kumar et al at the University of Madrid Research Center in 2016, there has been a significant increase in sudden cardiac deaths, rising more than 1.8 times over the last 5 years (18). According to the study by Dinash Rao, a legal expert on forensic pathologist in Jamaica during the years 2008 to 2011, by autopsy finding of 2,449 people, 204 had sudden cardiac death and had no significant increase compared to the previous years

(19). In the study of Mark Eisen from the American Boston Heart Center's Medical Center in 2011, the incidence of sudden cardiac death in the American society is estimated at 300,000 to 250,000 per year with a slight mild increase in annual rates, and sudden cardiac death is generally responsible for more than 50% of cardiac mortality. (20). In our study, the minimum age of patients who died due to sudden cardiac deaths was 23 with a maximum of 90 years, of which more than 75% were male, mostly in the age group of 50-65, 2.2% in the 20-35, 24.2, in 35-50, 42.5% in the 50-65, 26.3% in the 65-80, and 5.8% over 80 years old. The average age of the samples studied in this study was 58.05 years (standard deviation =13.56) with a mean age of 58 and mode 60-year. In the study of Rhajat deo and Hakaran from the Department of Cardiology at the University of Pennsylvania Philadelphia in 2011, the incidence of sudden cardiac death in the American society was between 180,000 and 450,000 per year and the risk increased with age, and males were more than women (21). According to Dinesh Rao et al's study, 62.24% of cases were in the age group of 50-60 years old and 28.43% in the age group of 60-69 years, and men were 10 times more involved than women (19). According to Dr Wu et al from the San Yatsen University Forensic Medicine Department of Guangzhou, China, during the period from 1998 to 2013, frequency of the sudden cardiac death was 43%, with a mean age of 38.2 years old and the highest

incidence was in the age group of 31–40 years; men were 4.3 times more likely to be involved than women. In this study, the majority of cases were free of job (47.8%) and then, retired (25.3%), employees (13.6%), and housewives (10.3%). There were also a few (2.8%) students among the sample of this study. In terms of the location of death, the largest out-of-hospital location (50%) included parks, vehicles, markets and streets, followed by death in the hospital (35.6%), and prehospital (14.5%). According to Dr Wu et al's study, 46.3% had sudden cardiac deaths in the hospital and 33.8% at home, and it was the highest in April–May (22). According to Dinesh Rao, the highest number of deaths (38.2%) occurred in the first hours (6 hours) of the onset of symptoms (19). In the study of Rajat Deo et al from the Department of Cardiology at the University of Pennsylvania Philadelphia in 2011, most cases occurred at home (21).

In our research, the onset of symptoms in the majority of cases were while resting or during normal activity (42.2% and 39.4%, respectively) and only 2.2% of the subjects had hard exercise. The onset of symptoms until death in most patients was less than one hour (59.1%), and about 90% of the patients died within less than 6 hours of onset of symptoms. The main cause of death in almost all patients was heart attack (99.2%). Myocardial infarction (MI) without any complications was found in 77% of cases, and MI with renal insufficiency, diabetes, and or hypertension was seen in others. In a study conducted by Miso Hayashi from the University of Nippon's Center for Cardiology at Tokyo University in an autopsy study in 2011, although the disease is called sudden cardiac death, about one third of patients died of other causes, such as bleeding or pulmonary embolism. (23). In the Mark Eestz study, the majority of patients didn't exist in the high-risk group, and even in societies with extensive training to rehabilitate patients with heart disease, only 8% of the patients left the hospital alive, and also the most common mechanism and cause of sudden cardiac death, was ventricular fibrillation (VF) (20).

In the Rajat Deo study, the risk of occurrence in the black race was more than white in any two-sex population, whose mechanism was not known; in men the cause of 80% of cases of sudden cardiac death was coronary disease, while in women 35%. The frequency of cardiomyopathy in women was 19% and in men 10%, and the heart was normal in 10% of cases in women and 3% in men. The most common arrhythmias have been associated with sudden cardiac death was related to ventricular thromboembolism (63%). Lower concentrations of magnesium were with a lower risk for sudden cardiac death and higher concentrations of trans fatty acids have been associated with higher risk. The CRP factor in men has been shown to be related to sudden cardiac death but in men not seen (21).

According to the Fabian Sachs Gumar study, sudden cardiac deaths occur in 62–85% of people with coronary heart disease, and in 15% of cases, sudden cardiac deaths are the first coronary manifestation (without previous history), as well. In the follow up of four years of patients with a

history of myocardial infarction, about one quarter of cases occurred during the first three months and half of sudden cardiac deaths occurred during the first year, with a higher risk for those with a lower ejection fraction (EF) of 35%. On the other hand, although a history of heart problems such as heart attacks and heart failure is associated with a higher risk of sudden cardiac death, 80% of the sudden cardiac deaths were asymptomatic patients and had no previous history, and in general, the risk of sudden cardiac deaths in women was at least a half of men (18).

Based on the study of catarrhosis, the most common cause of sudden cardiac death is primarily (50%) due to coronary artery disease and its ischemia, and then due to cardiomyopathy and genetic canalopathy (long QT syndrome, Borghada, etc.). Also, in sudden deaths occurring in sports, only about 25% of the cases have been diagnosed, of which 75% are associated with acute cardiac disease. Sudden cardiac deaths in the black race are twice as likely to occur than in white. In cases under 35 years of age, the most common cause of sudden cardiac death was arrhythmia, and in general, between 5% and 20% of cases of sudden cardiac death, no significant finding was found in autopsy (17).

In addition to demographic findings, in this study, the findings of the autopsy were extracted and analyzed. The average heart weight was 380.79 g (standard deviation = 67.42), with a median of 410 g and mode of 400 g in a range of 330 g to 730 g. 25% of the samples were less than 390 g and 75% of them weighed less than 480 g. Cardiac fibrosis was seen in 65% of the samples, with the highest in free left ventricular wall (24.0%) and then interventricular wall (13.3%). The lowest amount was observed on papillary muscle (2.7%). In terms of hyperemia, in about 42% of cases it was not observed. Left ventricle (27.3%) and subsequently interventricular wall (19.9%) were the most common hyperemia sites. In terms of coronary artery disease, about 93% of the cases had moderate to severe involvement, and the most common involvement was LAD and RCA (77.0%), followed by 3 Vessels (13.2%), LAD (2.2%) and finally RCA (0.6%). According to a study by Dr. Wu et al., The most common cause of sudden cardiac death was 41.6% related to coronary disease, followed by sudden unexplained death of 15.1% and myocarditis 11.8%. Of course, in patients under the age of 35 years, myocarditis and sudden unspecified death had a higher incidence of coronary disease.

Based on the anatomical area of coronary involved, single vessel coronary involvement was more than 2 and 3 vessels (47% vs. 39.7% & 16.2%;  $p=0.001$ ), and in general, the LAD branch had the highest rate of disease (95.4%), and the involvement of all three vessels increases with age. Also, the higher and more severe degrees of coronary involvement (grade 4) were in 67.2% of cases; the highest rates were seen at older ages. According to the Dinesh Rao study, the main cause in those cases were coronary disease (51.5% RCA & 42.6% LAD), and the involvement of all three major vessels in the age group of 50 to 59 years was more prevalent. In younger subjects,

the incidence of LAD was higher (proximal 3 to 5 cm of the anterior descending LAD) and, generally, the rate of involvement and obstruction in the LAD was greater than RCA (48.53% vs. 8.82%). Also, 39.2% died at home and 24% were hospitalized before death (19).

The aim of this study was to determine the epidemiological characteristics of sudden cardiac death among bodies submitted to the Tehran LMO. It has been mentioned that all such patients are not referred to LMO for forensic autopsy; a death certificate can be made by the physician by detecting normal death in a hospital, and or clinic, especially in patients with a history of heart attacks. So the results of our study can not be generalized to the community of all patients with sudden cardiac sudden. However, given the fact that autopsy can better find out the epidemiological features of sudden cardiac death and in most countries, including Iran, hospital autopsy (non forensic autopsy) is restricted, so the findings of this study can be helpful in finding out some of the epidemiological characteristics of sudden cardiac death.

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# Survey of Relationship Between Changes in Serum levels of Procalcitonin with Response to Treatment in Patients with SIRS Positive Acute Pyelonephritis

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## Abstract

**Introduction:** Urinary tract infection (UTI) is a common human illness. Patients with acute pyelonephritis may progress to septicemia and septic shock. Disease complications are significantly associated with increased mortality. Rapid and timely diagnosis of sepsis and differentiating it from non-infectious causes with similar symptoms is very important; because timely initiation of antibiotic therapy in patients with sepsis is vital in reducing mortality and improving final outcome. Serum procalcitonin level increases in patients with sepsis and bacterial infection. The aim of this study is measuring serum levels of procalcitonin in patients with Systemic Inflammatory Response Syndrome (SIRS) positive acute pyelonephritis before and after treatment and a survey of the relationship between changes in serum levels of procalcitonin with response to treatment in patients with SIRS positive acute pyelonephritis.

**Materials and methods:** This study was carried out on 30 patients older than 18 years with SIRS positive acute pyelonephritis who were admitted to Shahid Beheshti Hospital in Yasuj, Iran, in 2016. Before initiation of antibiotic treatment, procalcitonin levels were measured. Then 5 and ten days and two weeks after treatment simultaneous urine sample and a blood sample was taken. In cases with negative culture in each of their urine cultures, serum levels of procalcitonin were measured and the results were compared.

**Results:** This study included 30 patient (15 males, 15 females) with SIRS positive acute pyelonephritis. The mean and standard deviation of participant's pre-treatment serum procalcitonin level and post-treatment serum procalcitonin level were  $8/88 \pm 1/24$  and  $0/05 \pm 0/01$  ng/ml respectively, (p value= 0/001). The mean and standard deviation of pre-treatment serum procalcitonin level in patients with complicated and uncomplicated pyelonephritis were  $10/97 \pm 1/46$  and  $0/54 \pm 0/08$  respectively, (p value= 0/001).

**Conclusion:** The procalcitonin can be used in patients with urinary tract infections to evaluate their response to treatment and duration of hospitalization and duration of antibiotic therapy.

**Key words:** sepsis, pyelonephritis, procalcitonin, systemic inflammatory response syndrome, SIRS

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## Introduction

Urinary tract infection is a common and painful disease in humans (1). Urinary tract infections include cystitis (bladder infection), pyelonephritis (kidney infection) prostatitis (prostate infection) and urethritis (urethra infection) (1, 2 and 3). Following a urinary tract infection, the patient may have septicemia and septic shock. The incidence of disease complications is clearly associated with an increase in mortality (4). Currently, there are no strong inflammatory markers useful for determining the severity of the disease in febrile urinary tract infections (5, 6). Rapid and timely diagnosis of sepsis and its differentiation from non-infectious causes that manifest themselves with similar symptoms is very important because the timely start of antibiotic therapy in sepsis patients is to reduce mortality and improve the outcome of many patients (7). Many studies have been done in the last decade to access markers that can be used to detect early sepsis (8). Procalcitonin is produced during sepsis by macrophages and monocytes of various organs and released into the bloodstream (9 and 10). One of these studies has been conducted on the serum procalcitonin level in patients with sepsis, which results in an increase in the serum level of procalcitonin in these patients (11). Procalcitonin has a half-life of 20 to 15 hours in the blood and its concentration is related to the severity of infection in ICU patients (12, 13). Urinary tract infections cause more than 7 million referrals to doctors in the United States each year. These infections are detected in 1-3% of girls in school age and 2 to 8% of pregnant women. Symptomatic upper urinary tract infections are commonly prevalent in pregnancy and 20-30% of pregnant women with asymptomatic bacteriuria have pyelonephritis (4). Almost all women experience urinary tract infections during their lifetime (14). According to estimates, 10% of men and 30% of women after age 60 have bacteriuria, of which 30% are pyelonephritis (15).

The microbial spectrum of acute uncomplicated cystitis and pyelonephritis mainly consists of *Escherichia coli* (75 to 95%) and other *Enterobacteriaceae* species such as *Proteus mirabilis*, *Klebsiella pneumoniae* and *Staphylococcus saprophyticus* (2 and 3). The microbial spectrum of the UTI is wider and includes the above, as well as *Pseudomonas*, *Sarasia*, *Enterococcus*, *Staphylococcus* and fungus (16 and 17). Clinical manifestations of urethritis include: diarrhea, frequency, urgency and hematuria (18). Clinical manifestations include purulent discharge from the penis with irritation (1). Clinical manifestations of pyelonephritis include: high temperature symptoms associated with high fever (more than 38.5 degrees), chills, abdominal pain, tenderness of the vaginal cervix and vomiting (19). Pyelonephritis may cause complications including renal scarring and papillary necrosis and urinary tract obstruction and peri nephritis abscess, amphysematous pyelonephritis and chronic renal failure. Patients with urinary tract infections may also have septic septicemia and shock. The incidence of disease complications is clearly associated with increased mortality (4).

Diagnosis of acute pyelonephritis begins with taking a history and physical examination including body temperature measurement, tenderness of the costovertebral angle and examination of the abdomen and pelvis (20). The gold standard for diagnosis of urinary tract infection is urinary culture. Unfortunately, however, the results are not available until 24 hours after referral. Under the following conditions, growth of less than or equal to  $10^5$  micrograms can indicate a real infection:

- 1) Patients who received recent antibiotics.
- 2) Patients who have growths less commonly found in their urine culture such as *Pseudomonas*, *Klebsiella*, *Sarasia* and *Enterobacteria* (21).

Sepsis is a leading cause of worldwide mortality, accounting for 26% of hospitalized patients and 16% of patients hospitalized in intensive care units (22 and 23). It is also responsible for 18- 28% of hospital deaths (24). Rapid and timely detection of sepsis and its differentiation from non-infectious causes that manifest themselves with similar symptoms is very important because timely antibiotic treatment in sepsis patients is vital in reducing mortality and improving the final outcome of patients (25).

## Materials and methods

This cross-sectional and descriptive-analytic study was conducted on patients with acute pyelonephritis.

15 patients were male and 15 were female. Data were gathered and analyzed by SPSS 9.1 software. To examine the t-test, paired t-test and one-way variance analysis in the case of normal variables were used. In all statistical tests, the level of significance was less than 5%.

In this study, which was performed at Shahid Beheshti Hospital in Yasuj in 2016, patients over the age of 18 who had fever and at least one of the symptoms of dysuria and frequent urination, pain and tenderness of costovertebral angle were diagnosed with acute pyelonephritis. After explaining the goals of the study, they indicated their willingness to cooperate. After receiving informed written consent, the urine specimen was collected in a sterile container and cultured on an agar culture medium, and patients who, after 48 hours of urination, had more than 100,000 colonies of bacteria per milliliter were considered as urinary tract infection (UTI), and among these patients, those with two or more criteria of SIRS, were included in the study. Before starting antibiotic treatment, 2 ml of blood sample was taken and after centrifugation and separating the serum, the specimen was transferred to a freezer and stored at a negative temperature of  $40^{\circ}\text{C}$  until all samples were maintained under the same conditions. From patients on day 5 and on day 10 and two weeks after the start of treatment, urinal culture and blood samples were taken simultaneously. If urine culture in each of the cultures was negative, the serum sample of the same day was used to measure the serum Procalcitonin level. Sample serum freeze was deciphered at room temperature after completion of the sampling, and the Procalcitonin serum titre was measured using electrochemiluminescence

method based on the electron velocity in the circuit with ELEXIS.

## Results and Conclusion

The results of this study showed that Procalcitonin serum level in patients with acute pyelonephritis is associated with response to treatment, and with the onset of antibiotic therapy and negative urine culture, its level is significantly reduced. These results, with the study of Mobin et al. (2010), correspond to the relationship between Procalcitonin and response to treatment (29).

The results of this study showed that patients with serum Procalcitonin before treatment had a higher serum Criteria SIRS score. In a study by Fardin Asadi et al, in 2014 comparing CRP and Procalcitonin in children with SIRS and septic shock, it was shown that the Procalcitonin and CRP levels in patients with septic shock was significantly higher than patients with SIRS and sepsis. Procalcitonin is more sensitive in differentiating them (32). From these findings, it can be concluded that patients with acute SIRS-positive pyelonephritis, with higher Procalcitonin levels, are at increased risk of septic shock.

This study also showed a significant relationship between the Procalcitonin serum level before treatment in patients with acute SIRS positive acute pyelonephritis and the number of admission days, and patients with serum Procalcitonin before treatment had higher the number of days in hospital. Sugimoto et al. (2013) in a study on acute pyelonephritis patients showed that patients with high Procalcitonin levels (greater than 10 ng / ml) had more severe complications than other patients (27).

Ahmadinejad et al. (2009) conducted a three-year study on the procalcitonin role in the differential diagnosis of infectious and noninfectious systemic inflammatory response syndrome that showed a significant difference between serum Procalcitonin (greater than 10 ng / ml) and death; there was a meaningful relationship between patients with infectious sepsis (30). In a study by Levy MM et al. (2003) on patients with sepsis admitted to the intensive care unit, the survival rate of these patients was reported to be closely correlated with a reduction in procalcitonin serum levels between two to three days (28). From these findings and the results of previous studies, it can be concluded that patients with acute SIRS-induced acute pyelonephritis with a higher serum procalcitonin level will have longer hospitalizations.

In this study, patients with serum Procalcitonin before treatment were shown to have a longer urine culture negativity. The results of Hladík et al. (2005) in the study of procalcitonin and its role as an inflammatory bio-marker correspond to the results of our study (26).

From the findings, it can be concluded that in patients with acute pyelonephritis, SIRS-positive Procalcitonin can be used as a biomarker for rapid assessment of response to treatment, and in patients with a low serum Procalcitonin

antibiotic treatment can be stopped.. This can reduce the long-term use of antibiotics and reduce the growing trend of microbial resistance to antibiotics. Future studies are suggested separately for each infectious disease with a larger sample size and the results should be compared.

The results of the study showed that there was no significant difference between Procalcitonin level before treatment and type of microorganism grown in urinary culture. Of the 30 patients, 22 patients were positive for urinary culture with *E. coli*. The mean and standard deviation of Procalcitonin level before treatment in this group of patients was  $5.56 \pm 4.15$  ng / ml, whereas in one the patient had positive urine culture with an *Acinetobacter*. The mean and standard deviation of Procalcitonin serum level in this patient was  $22.67 \pm 12.12$  ng / ml. It is recommended that more studies be done with a larger sample size to compare the type of bacteria grown in urine culture and Procalcitonin levels and compare the results.

In this study, it was also shown that in patients with complicated urinary tract infection, the serum Procalcitonin level before treatment is higher than patients with uncomplicated acute pyelonephritis. Therefore, the duration of antibiotic treatment and the length of hospitalization should be carefully considered in these patients.

In this study, only Procalcitonin was used to evaluate the response to treatment. Mitaka C reported that Procalcitonin and CRP increase in sepsis and inflammatory diseases. The study, which was conducted in 2005 on differentiated clinical trials between infectious and non-infectious SIRS, showed that Procalcitonin and CRP increased in infectious and non-infectious SIRS, but Procalcitonin was more closely related to the severity of sepsis (31).

In this study, Electrochemiluminescence (ECL) method was used to measure Procalcitonin level and it is based on the latest laboratory methods. On the contrary, the ELISA method used to determine the Procalcitonin level based on changes in particle color Latex. In this method, the serum level of Procalcitonin is quantitatively titrated, which will be more valuable than the semi-quantitative ELISA method to assess the response of patients to treatment. Most of the previous studies have been done on Procalcitonin using semi-quantitative ELISA and further studies are recommended using the new ECL method and the results to be compared.

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# Effects and mechanisms of medicinal plants on dopamine reward system to reduce complications of substance abuse: A systematic review

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## Abstract

Substance abuse is one of the problems that many countries are currently dealing with and it imposes several complications on our communities. The dopamine reward system is one of the regions of the brain that plays important roles in the pleasure and persistence of addiction. This review was conducted to investigate the effects and action mechanisms of medicinal plants on the dopaminergic reward system in preventing substance abuse. The key words "dopamine\*" in combination with "substance abuse", "drug abuse", "addiction" or "medicinal plant", "herb\*", and "phyto\*" were used to retrieve relevant publications indexed in the Institute for Scientific Information (ISI) and PubMed using the EndNote software. After examining the studies, we included 23 of them in final analysis. Medicinal plants and their derivatives can exhibit anti-addiction effects in substance use disorders mainly through influencing dopamine receptors (D1 and D2). They can also serve as appropriate alternatives to drugs and to help treat relapse due to stimulating the dopamine reward system. Because substance abuse is multifactorial, it should be taken into account that phytotherapy alone cannot be effective in treating it but instead a combination of different therapies should be adopted to fight it.

**Key words:** Medicinal plant; Dopamine; Neurotransmitter; dopamine reward system

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## Introduction

Substance use disorders (SUDs) represent one of the problems that have engaged global communities in terms of both morbidity and mortality with stupendous costs on them (1). Substance abuse can lead to increased risk of chronic diseases, family breakdown, job loss, reduced longevity, crime and increased violence (2). The dopamine reward system of the brain is one of the most important mechanisms that arouses SUDs and prevents substance abuse withdrawal. In other words, stimulation of this system in the brain is misused and substance abuse occurs as an associated complication (3). Dopamine (DA) is considered one of the most important neurotransmitters in the dopamine reward system. The reward reinforcement circuitry modulates certain physiological and instinctive activities in humans including eating, water drinking, and sexual behaviors (4, 5). The disorders that involve the dopaminergic system impair cognitive functioning, and certain drugs are helpful to treat schizophrenia or attention deficit hyperactivity disorder (ADHD) in children (6), schizophrenia, Parkinson's disease, bipolar disorder, and Huntington's disease through targeting dopaminergic neurotransmission and its receptors (7-9).

Currently, despite the availability of several psychotherapies and behavioral therapies, chemical treatments for various disorders remain particularly important (10-16). Meanwhile, medicinal plants are being increasingly welcomed because of fewer side effects and lower costs (17-24). Medicinal plants can serve as effective treatments for different disorders and diseases (25-32).

Given the physiological and psychological significance of DA, we conducted this review to identify and investigate the action mechanisms of medicinal plants and their derivatives on the dopamine reward system, to decrease SUDs.

## Materials and Methods

The search terms of interest and Endnote software were used. The key words "*dopamine\**" in combination with "*substance abuse*", "*drug abuse*", "*addiction*" or "*medicinal plant*", "*herb\**", and "*phyto\**" were used to conduct this review. Relevant articles were retrieved from the databases Institute for Scientific Information (ISI) and PubMed. Then, the plants and the plant-based products that were effective on dopamine reward system in substance abuse were selected according to the comments of two colleagues. The articles included in this review were published between 2010-2017. The articles whose full text were not accessible, studies with non-positive effects, articles written in non-English languages and irrelevant to the purpose of this study were excluded after the authors' agreement was achieved. Finally, 23 articles were included in the study.

## Results

Plants and plant-based compounds can be used to treat SUDs through relatively similar mechanisms, mainly influencing dopamine receptors (Table 1 - next page).

Controlling mental pressures contributes greatly to treating and preventing substance dependence. Choi et al. reported that the plant combination extract of *Elsholtzia ciliata*, *Shinchim*, *Angelicae gigantis Radix*, and *Eugenia caryophyllata* was helpful to reduce withdrawal complications through increasing dopamine function of the brain and affecting dopamine transporter (DAT) protein (50). An-jun-ning is the other herbal formulation that returns dopamine D2 receptor (D2R) and DAT to normal levels and decreases dopamine system with opioids in mice with addiction (51). In a study with alcoholic mice, the other herbal combination made up of *Tianma* (*Rhizoma Gastrodiae*), *Gouteng* (*Ramulus Uncariae Rhynchophyllae cum Uncis*), and *Baishao* (*Radix Paeoniae Alba*), called *Pingan Fingan*, was shown to decrease DA and glutamate (Glu), and  $\alpha$ -aminobutyric acid (GABA) in the dopamine system of the brain and therefore can be effective in alcohol withdrawal (52). Kudzu is a Chinese herbal combination that can decrease the scores on Alcohol Use Disorders Identification Test in people with alcoholism due to daidzin (53). In two studies, patients with heroin addiction were administered with *Jitai* tablet. These studies showed that 6-month treatment with *Jitai* tablet led to increase in striatal DAT availability and DAT (54,55).

Medicinal plants exhibit anti-addiction properties through several mechanisms including physiological, biochemical, psychological, and transcendent mechanisms (56). Studies have also investigated the other aspects of this issue. A study showed that medicinal plants could decrease the unpleasant complications due to long-term substance abuse such as depression and anxiety and even be useful in treating these two psychiatric disorders (55). Herbal combinations cause increase in serotonin, DA (57), and dopamine transporters (55) and are therefore effective in treating anxiety, which is the other mechanism to decrease this complication. Medicinal plants can exert their effects in regulating the dopamine system of the brain and treating the associated diseases through important mechanisms such as influencing dopamine receptor antagonism (40). Medicinal plants and their derivatives decrease oxidative stress in the body (58-60). They may control neuroinflammation and decrease dopaminergic degeneration in the nervous system (61-65). It is important to determine the active doses of medicinal plants so that they can be effective in modulating and regulating dopamine. They should be usually consumed as balanced to cause as few side effects as possible (66). In addition, it should be taken into consideration that certain medicinal plants that contribute to increasing DAT levels and can decrease lactation, and therefore should be consumed cautiously and under physician's supervision in lactation (67-70).

Table 1: Medicinal plants and phytochemicals effective on dopamine

Plants /Phytocompound names	Type of use/ Origin	Main effects and mechanisms	References
<i>Brugmansia arborea</i>	Extract	Affecting the dopaminergic and the cholinergic systems, probably providing a neurobiological substrate for treatment of morphine or cocaine abuse	(33)
<i>Black asphaltum</i> (shilajit)	Extract	Altering cortico-hippocampal dopamine in alcoholic mice	(34)
<i>Thunbergia laurifolia</i> Linn.	Extract	Stimulating dopamine release from the nucleus accumbens (reward area responsible for addiction) both in vitro and in vivo as with cocaine and amphetamine without being addictive.	(35, 36)
<i>Paecilomyces japonica</i>	Extract	Modulating brain dopaminergic systems.	(37)
<i>Scutellaria baicalensis</i> Georgi	Extract	Attenuating morphine addiction-related behavior through functional regulation of dopamine receptors	(38)
Silibinin	<i>Silybum marianum</i>	Attenuating decreases in the dopamine content of the prefrontal cortex and treating the methamphetamine (METH)- induced cognitive impairments	(39)
Tetrahydropalmatine (l-THP)	Corydalis and Stephania	Preventing substitution of the dopamine D2/D3 receptor agonist and attenuating the reinforcing and subjective effects of cocaine, therapeutic effect on METH-induced locomotor sensitization; suppressing the rewarding properties of METH and elevating extracellular dopamine (DA) levels in the nucleus accumbens shell (nAcb); treating addiction and preventing relapse in nicotine and heroin-induced reinstatement.	(40-44)
Terpenoid cannabinoids	Cannabis plant	Modulating endocannabinoid and transient-receptor-potential-channel systems for cannabinoid abuse	(45)
Sauchinone	<i>Saururus chinensis</i>	Blocking the acquisition and expression of conditioned place preference (CPP) and acute hyperlocomotion induced by METH in mouse.	(46)
Tetrahydroprotoberberine	Corydalis yanhusuo W.T. Wang	Binding dopamine D1, D2, and D5 receptors and treating cocaine addiction	(47)
L-Stepholidine	<i>Stephania intermedia</i>	Influencing dopamine D1 receptor agonist/D2 antagonist properties and treating heroin relapse	(48, 49)

It is also worth mentioning that relapse of substance abuse is a complex and multifactorial issue that is affected by certain factors such as inappropriate lifestyle, unhealthy diet, unhealthy social relationships, inadequate physical activity, and even the type of abused substance, and therefore various treatments may be required to prevent substance abuse relapse (71,72). Therefore, using medicinal plants alone cannot be sufficiently effective to treat the complications of substance abuse and a combination of different therapies such as chemical treatments and psychotherapies should be

adopted to achieve the highest possible efficiency. Certain plants and their derivatives decrease withdrawal syndrome symptoms even through fighting the opioid system (66).

## Conclusion

Medicinal plants and their derivatives can exhibit anti-addiction effects in SUDs mainly through influencing D1 and D2. They can also serve as appropriate alternatives to drugs and to help treat relapse due to stimulating the dopamine reward system. Although medicinal plants and their derivatives can help withdrawal from drugs and prevent substance abuse relapse through various mechanisms including physiological, biochemical, and psychological, it should be taken into account that phytotherapy alone cannot be effective in treating a complex disease such as substance abuse because they have mainly biologically therapeutic effects.

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# Medicinal plants effect on prolactin: A systematic review

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## Abstract

Prolactin has many roles in the human body and in other mammals. Increased prolactin can cause many diseases, including infertility, sexual dysfunction, and mental illness. Therefore, in this study, we sought to identify and investigate the action mechanisms of medicinal plants and their derivatives in increasing, modulating and neutralizing the harmful effects of prolactin (PRL). In this systematic review, articles indexed in the Institute for Scientific Information (ISI) and PubMed databases were retrieved using relevant search terms by using the Endnote software. Of the 432 retrieved articles, finally 37 articles were included in analysis. Plants and herbal compounds such as *Withania somnifera*, *Fructus Hordei Germinatus*, resveratrol and kolaviron, are effective in reducing PRL and improving hyperprolactinemia (hyperPRL). But, some plants such as *Cnidioscolus aconitifolius*, *Meenakshi Cissampelos pareira* Linn., *Mimosa pudica*, *Cyperus rotundus* Linn., *Urtica dioica*, soybean and compounds such as silymarin and puerarin are effective in increasing PRL and lactation. Certain plants and their derivatives increase PRL levels due to phytoestrogenic properties and isoflavones by influencing dopamine receptors and other mechanisms that need to be further investigated. On the other hand, by inhibiting dopamine-2 receptors, these compounds can be effective in modulating or reducing PRL and treating diseases such as hyperPRL.

**Key words:** Medicinal plant; Prolactin; Phytotherapy

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## Introduction

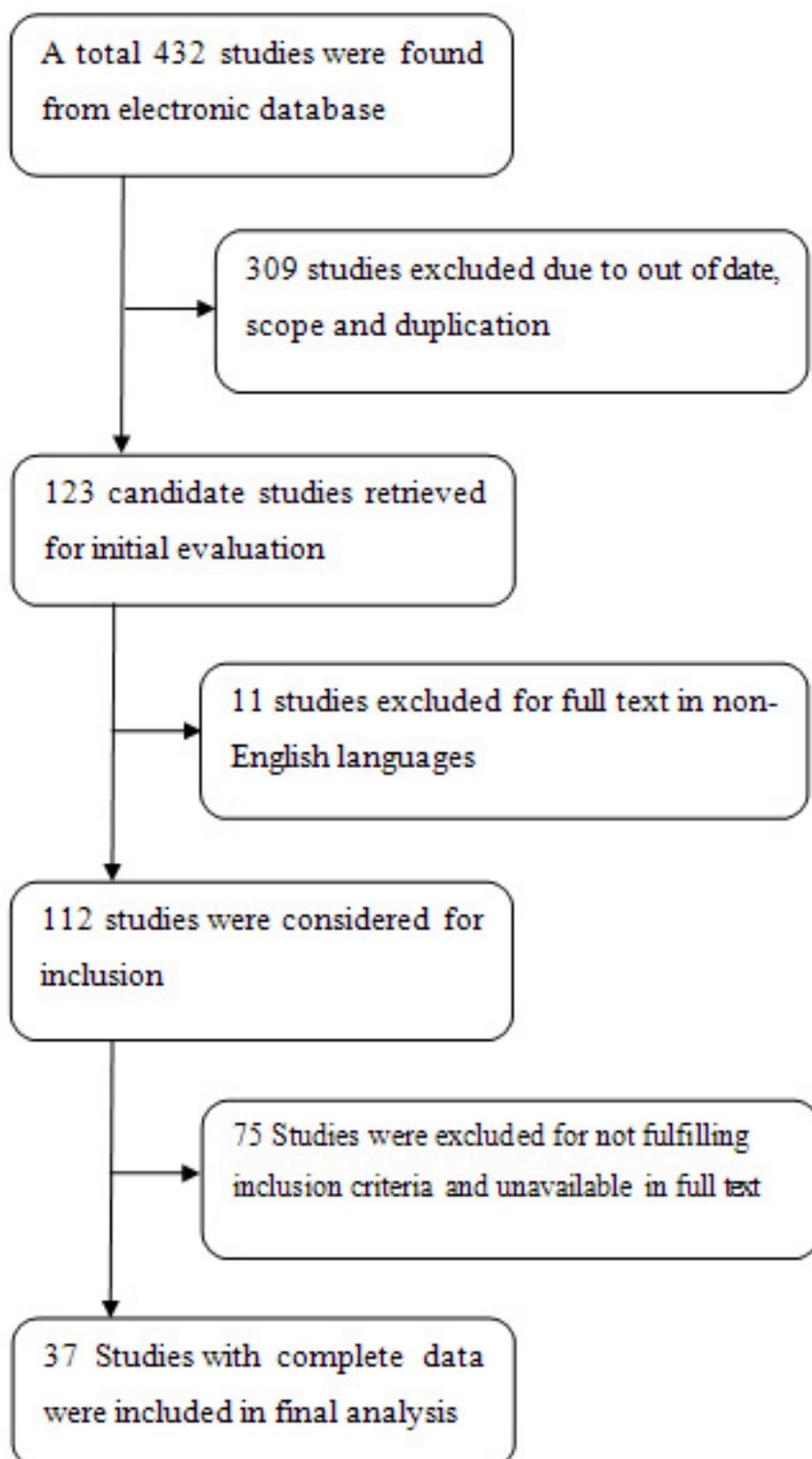
Prolactin (PRL) is a hormonal protein that is widely distributed in animals and is secreted from the anterior pituitary (1). The balance of this hormone in the body is very important, because its increase or decrease in the body causes many complications. Increased PRL secretion, known as hyperPRL, is associated with ovulatory disorder and subsequently secondary amenorrhea or oligomenorrhea (2) and also is considered a male infertility factor (3). It is associated with other disorders such as hypothyroidism (4, 5), osteopenia (6), depression, hostility, and anxiety (7). On the other hand, PRL deficiency in lactating women may disrupt the growth of infants, necessitating therapeutic measures (8, 9). In addition, the presence of PRL disrupts the process of breast cancer chemotherapy and thus its production should be reduced in the body [10].

Today, in spite of numerous therapies to promote different dimensions of health, chemical treatments and phytotherapy are still important with respect to the treatment of different disorders and diseases (11-15). Dopamine is a major inhibitor of PRL secretion by influencing D2 receptors in membrane cells of lactotrophs (16). Therefore, dopamine agonists can be used to treat hyperprolactinemia (2). But chemical treatments for PRL-related disorders are associated with several complications. Hence, finding several therapeutic strategies can help reduce these complications especially in lactating women (17, 18). In addition, medicinal plants are used for the treatment of psychological and physiological diseases due to their comparatively fewer side effects and lower cost (19-27). Therefore, in view of the importance of PRL in human health, we conducted this review to identify and investigate the action mechanisms of medicinal plants and their derivatives in increasing, modulating and neutralizing the adverse effects of PRL.

## Materials and methods

The search terms of interest, medicinal plant, herb and phyto, and the EndNote software were used to retrieve the relevant articles indexed in the Institute for Scientific Information (ISI) and PubMed. Then, the plants and the plant-based products that were effective on prolactin were selected by two colleagues. The manuscripts included in this review were published between 2007 and 2017 and reported the studies with clinical trial or experimental design. The articles published in non-English languages and not related to the purpose of this study were excluded after the authors agreed on it. Figure 1) is the flowchart that illustrates how the articles were selected for final analysis.

**Figure 1. Process of selecting articles for final analysis**



**Table 1: Medicinal plants effective on PRL**

Plants	Kind of use	Main effects and mechanisms	References
<i>Cnidoscopus aconitifolius</i>	Leaves extract	Increasing serum prolactin concentration	(28)
<i>Meenakshi Cissampelas pareira Linn.</i>	Methanolic leaf extract	Altered gonadotropin release (LH, FSH and PRL) and estradiol secretion and cause infertility	(29)
<i>Mimosa podia</i>	Root extract	Increasing level of PRL secretion and altered gonadotropin release	(30)
<i>Lithuania somniferous</i>	Root extract	Reducing levels of PRL and increasing the chance of male fertility	(31)
<i>Fructus Hordei Germinatus</i>	Total alkaloids and aqueous extract	Regulating serum PRL levels to normal in the rats with hyperprolactinemia and reducing the secretion of PRL in hyper PRL rats	(32-35)
<i>Cyperus rotundus Linn</i>	Aqueous extract	Stimulating synthesis of PRL significantly and consequently effective in increasing the lactation	(36)
<i>Urtica dioica</i>	Hydroalcoholic extract	Increasing in serum prolactin and alveolar diameter	(37)
Soybean	Hulls	As a phytoestrogen can increase level of PRL	(38)

**Table 2: Phytochemicals effective on PRL**

Phytocompound names	Origin	Main effects and mechanisms	References
Genistein	Soy bean	Estrogenic effect of genistein can increase serum prolactin and gene expression and prolactin release	(39, 40)
Daidzein and Equol	Soy bean	Exerts estrogenic like effects on the lactotropes in ovariectomized rats and increases level of serum prolactin and regulate PRL and prolactin receptors (PRLR) and regulating gene mRNA levels in the hypothalamus-pituitary-gonadal axis	(41-43)
Silymarin	Milk thistle (Silybum marianum fruits)	Increasing circulating prolactin through involving, at least in part, dopamine D(2) receptors	(44)
Rutin	Supplement	Promoting pituitary PRL and up-regulated the gene expression of PRLR	(45)
Resveratrol	Supplement	Decreasing prolactin level via impact on estrogen receptors and suppression of GH3 cell growth and through the inhibition of PRL synthesis	(46)
Kolaviron	<i>Garcinia kola</i>	Ameliorating the PRL in benign prostatic hyperplastic rats	(47)
Puerarin	<i>Pueraria lobata</i>	Increasing levels of PRL and effect on somatotropes and pituitary estrogen-responsive mRNA expressions	(48)

Several plants and herbal formulations were found to contribute to increasing, modulating and neutralizing the harmful effects of PRL in the body (Tables 1 and 2).

## Discussion

Several herbal formulations are used to counteract variations in PRL level in the body. For example, Lirukang Granule is a herbal formulation used in traditional Chinese medicine that regulates PRL levels in patients with hyperplasia of mammary gland (49). Ushiroyama et al. conducted a study on Xiong-gui-tiao-xue-yin with women

in the postpartum period. The results of Ushiroyama et al. indicated that this herbal formulation increased PRL and subsequently increased the breast milk in the mothers treated with it (50). The combination of two herbs called ayahuasca vine (*Banisteriopsis caapi*) and a shrub called chacruna (*Psychotria viridis*) is a herbal formulation called Ayahuasca, which is used in some regions as tea. This formulation increased the levels of PRL by influencing neuroendocrine stimuli (51). The studies of Wang et al. and Yuan et al. on Peony-Glycyrrhiza Decoction, which is a dopamine agonist, with animal models indicated that this combination could lead to a decrease in PRL production in

MMQ cells via modulation of dopaminergic (52-54). Two compounds of this combination, paeoniflorin and liquiritin, are also effective in treating hyperprolactinemia (55). Li et al. examined the use of a Chinese herbal formulation called Lirukang Granule with psychotherapy in patients with cyclomastopathy and menoxenia. They found that treatment with this formulation reduced PRL levels (56). A study on a Chinese formulation called Huiru Yizeng Yiha showed that this formulation reduced PRL levels, increased estradiol levels and led to hormone modulation in hyperPRL (57). In a study on the effect of a herbal mixture called formula malt decoction (FMD) on hyperPRL, this Chinese herbal mixture was found to exert a potent anti-hyperplastic activity by suppressing PRL synthesis and influencing dopamine D2 receptor (58).

## Conclusion

Certain plants and their derivatives can increase PRL levels due to phytoestrogenic properties and isoflavones by influencing dopamine receptors and other mechanisms that should be further examined. Besides that, by inhibiting dopamine-2 receptors, these combinations can be effective in modulating or reducing PRL and to treat diseases such as hyperPRL.

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# Complications of vaginal delivery after previous cesarean delivery in Iran

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## Abstract

Pain has been known to man since the very beginning of creation, and man has always tried to fight it in various ways. One of the most severe of these pains is labour pain.

These days, despite the increasing number of cesarean sections, most women simply opt for natural delivery. According to the World Health Organization, the rate of cesarean delivery is 15%, which is very different from the recommended rate in most parts of the world.

On the other hand, physicians believe that cesarean delivery can be considered as a delivery method only if it is impossible to carry out normal delivery or if the health and life of the mother, the fetus or both of them are at risk. One of the most effective ways to reduce the incidence of cesarean section is to carry out normal delivery after cesarean section and to reduce cesarean section repeatedly. The above review article aims to survey vaginal delivery indices after delivery of cesarean section, maternal and fetal complications, as well as suggestions and strategies for proper use of this type of delivery.

**Method:** This paper is a literature review.

**Key words:** vaginal delivery, cesarean section, complications of childbirth, normal delivery after cesarean section

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## Introduction

Childbirth is one of the divine blessings for generating mankind on earth, which has always been on the rise since the creation of mankind. The delivery mechanism is a spontaneous process, without the need for intervention, has been going on for many years in its natural course. With the advent of science and technology over the past decades, human beings have come up with ways to help it with surgery in cases where the mother or fetus's life is in danger. Unfortunately, after some time, this method, which was only used for emergency use and to save the lives of mothers and fetuses, has become more prevalent among societies and has become a means of escape from labor pain, so that today in many societies the delivery by cesarean section has become a culture and more than half of women volunteer for cesarean section.

However, the surgery itself has many consequences, including complications of anesthesia, bleeding, embolism, post-operative infections, and maternal mortality after cesarean section, all of which are physical and emotional complications for the mother. The cost of delivery for mother and family is 2-3 times higher. Also, the mother's disability after cesarean section causes the mother to be completely neglected and her baby is not properly nursed after birth. Despite all the complications, the prevalence of this surgery is increasing in most Western and developing countries (1,2). The prevalence rate in the United States is 26%, England 21%, South Ireland 23%, Australia 23%, Brazil, Chile and Paraguay 50% in 2006 (3) and in Iran, according to the 2006 statistics, the rate of cesarean section was 42.3% (2-4)

One of the causes of increasing cesarean section in the whole world is the increase in the age of pregnant mothers, the increase of electronic care for the fetus, increased interventions in labor and the fear of doctors and medical staff from the implementation of legal procedures for childbirth (complaints). (3-4) The World Health Organization, in order to maintain maternal and fetal health, has approved a cesarean delivery rate of 15 % by 2010 for mothers who are pregnant for the first time and has called for a reduction in repeat cesarean rates from 62% to 72% among the world's societies. (5)

About 20 years ago, the American College of Obstetricians and Gynecologists (ACOG) began offering strategies for reducing cesarean delivery and reaching the WHO standard by 2010, including postpartum vaginal delivery Cesarean section (Vaginal birth after cesarean section). (6-7)

Following the launch of these strategies between 1989 and 1996, the rate of cesarean section in the United States is declining in the rate of VBAC. (7) A US study between 1997 and 2002 showed that out of 54,146 deliveries, 8,030 cases (14.8%) of vaginal delivery were postpartum after cesarean delivery, and the results of this study showed that maternal and fetal complications in this group, (group VBAC) were not statistically significant in terms of cesarean section (repeated cesarean section). (8)

The results of a retrospective cohort study in 2006 of 61,619 out of 17 American hospitals showed that if the conditions for vaginal delivery were observed after delivery of cesarean section, the maternal side effects in the VBAC group were significantly lower than those of the selected cesarean group. The researchers suggested that it is better for women to receive the necessary training if they have the necessary conditions for the delivery of vaginal delivery after delivery of cesarean section. (9) Postpartum vaginal delivery Cesarean section can be one of the biggest changes in women's care and midwifery in the current century. To perform this type of delivery, the clinical conditions (scientific) and legally prescribed conditions should be taken into consideration, and then the delivery should be done to avoid complications for mother and fetus. The purpose of this article is to review the conditions, benefits, complications and clinical care of women who are candidates for this type of delivery.

## Discussion

Childbirth is a physiological and completely natural process that begins on the basis of some regular activities and regular changes that occur on their own. Delivery is divided into three general stages: the first stage, which initiates labor pain and progresses so that the uterus is ready for the baby to leave. The second stage, in which the baby leaves the womb and the birth occurs. The third stage, the delivery of the placenta.

Caesarean section is defined as the birth of an embryo by creating an incision in the abdominal wall (laparotomy) and the uterine wall (hysterotomy) (10) and is now commonly used as a surgical procedure in most cases of labor in Iran (11). The use of cesarean technique in recent years, has been increasingly prevalent, while cesarean was once used only for mothers who were at risk during their pregnancy and childbirth (12). The standard of delivery for cesarean delivery is 15% from the WHO statistics (10), but in many parts of the world it is significantly different from that recommended by the World Health Organization (13). Cesarean delivery in the United States from less than 5% in 1965 increased to 30% in 2005. (14) Martel 2005 reports that in Canada there is an initial cesarean

section rate of 21.1% (15), Boewley (2013) in the United States in nulliparous women (30.8%), and in multiparous (11.5%), Bengal in India (22) at 24% (17) Festin (2009) reported in China at 25% (18) and Bragg (2010) in Italy reported 35% (19). In Iran, the actual cesarean section (2002) in Shahrood was 26% (2) Sayed Noori (2006) in Rasht, (57%) East Afshin (1389 ) in Ardebil, 58.6% (21) Shakerian (2002) Mahal and Bakhtiari, 44% (22) Farzan (1389 ) reported in public and private hospitals in Isfahan, 73.6% (23). Also, in a study done by Khosravi (2007) in Bojnourd, the rate of cesarean section was 25.4%. Natural treatment after cesarean section is associated with possible risks and sometimes has a clinical indication of cesarean section repetition. Clinical judgment is important in deciding whether to have normal delivery after cesarean section or to repeat cesarean section.

### Natural prophylaxis after cesarean section.

The classic scars of caesarian section are the lower vertebral scar, extending up to the upper segment scar. (5) If the choice of the patient is accurate and the delivery is adequately monitored, most women who have already received cesarean section can undergo subsequent vaginal delivery (5) The success rate of normal delivery after cesarean delivery in selected patients is approximately 60-80% (5)( Naji (2013) in England). The success rate of postnatal delivery after 2013 in the study of cesarean section was 61%. (Bengal showed that 85% of people who entered normal delivery after cesarean section succeeded and 15% failed (2012). If normal delivery is successful after cesarean section, complications such as hospitalization, maternal fever, and repeated cesarean section will be less (26), but problems in normal delivery after cesarean section occur when the supervision is not directly on the patient. Detection of uterine rupture is delayed (5). Due to the importance of the subject and the complications of repeated cesarean section and that we did not have access to research work in this field, a research aimed at determining the frequency and some maternal and neonatal outcomes of the natural delivery after cesarean section was conducted in the hope that the results of this study would be a step towards child-rearing policies. Sisters usually take 45 minutes to 1 hour to perform a caesarian section.. It can be done with an anesthetic of the spine, where the woman is woman awake or under general anesthesia. Then an incision about 15 cm is usually done through the mother's abdomen. The uterus then opens with a second incision and the baby is delivered. The =incision is then closed (24). This incision is not limited to the abdominal skin and it is necessary to split several layers so that the surgeon can access the embryo inside the uterus. Caesarian section is a surgical procedure. As a result it can have complications for the mother across three categories: physical, emotional and fetal complications. The physical complications of cesarean delivery are higher than normal delivery. These complications are usually postpartum hemorrhage, infection, pelvic damage and coagulation disorders for the mother, and can lead to complications such as respiratory problems for the infant before the onset of labor pain for the mother, due to the lack of a respiratory system and subsequent shortness of

breath. Caesarean section can cause urinary problems such as urticaria, urinary tract infections and bladder pain after cesarean delivery. Mothers who undergo caesarean section undergo a longer process to return to their original state, and in the subsequent pregnancies of those who have had with cesarean section, the probability of having a placenta other than the normal place in the uterus (or pathways) or growth-related adhesions. Abnormalities occur in the tissues of the uterus and in the adjacent organs, causing severe complications for the mother, or even causing maternal death. Iran is ranked second in terms of cesarean section statistics. Caesarean section indications are because of probable infection of the uterus. It is higher than in a natural delivery due to the opening of the abdomen and the uterus, the risk of infection, the location of sutures, and the amount of bleeding in the body. Due to the loss of large amounts of blood, the likelihood of need for blood transfusions increases, which can cause complications. There are also drowsiness-related illnesses. The possibility of constipation due to the use of anesthetic drugs in Caesarean section is more than normal delivery. There is a risk of uterine rupture due to the opening of sutures in subsequent pregnancies. In the cesarean section of mothers, there is a risk of contracting the placenta to the site of uterine suturing in the next pregnancy, resulting in a risk of uterus more in mothers Cesarean delivery than mothers with normal delivery. The duration of hospitalization is higher in mothers with cesarean section. As a result, the risk of infection increases on the one hand, and on the other hand it is more economically costly than normal delivery. In cesarean section women, the probability of a subsequent cesarean section increases. Complications may also occur after several weeks, several months, or even several years after cesarean section. These include abdominal pain due to abdominal bloating, bowel obstruction due to adhesions due to surgery, and opening of the surgical cutting site in the next pregnancy. Cesarean section mothers feel tired and sleepy, which can be due to anaesthesia drugs. These mothers may not necessarily have a good emotional and immediate relationship with their baby because of the state of aches and pains after the operation. Sitting and walking after this operation is associated with severe pain, but mothers must walk in order to prevent the accumulation of gas in the intestines. The mother should be hospitalized for several days after surgery. Respiratory and jaundice problems from birth problems can occur with cesarean section. Caesarean section is better for the baby as it does not impose pressure on the baby, but this pressure is also beneficial for the baby, because their lungs are moved by the stimulation of the condition. That is why respiratory problems in newborns are more in caesarian births than normal birthd. The pressure on the head of the fetus should also not be worrying because the bones in the head are constructed naturally in a way that can tolerate this pressure. Anesthetic agents can have effect on the fetus because we know that the use of any drug can affect the fetus. It is possible that fetal injuries such as fetal skull fractures or fracture of other bones and paralysis may occur. The failure rate of breastfeeding is also higher than in normal delivery. Since the benefits of breastfeeding are natural, cesarean delivery will be

problematic for mothers who are feeding their babies with breast milk. Breastfeeding does begin in women with cesarean delivery. The most dangerous side effect of cesarean section is neonate premature inflammation, the term "prematurely" is commonly used to describe a neonatal condition where the baby was born prematurely due to the timing of the cesarean section. It has been found that babies who are born with a selective cesarean section are significantly at increased risk of developing RDS (respiratory distress syndrome). In most hospitals, general anesthesia is performed for cesarean section and unfortunately, the drug used for maternal anesthesia reaches the baby's body through the placenta. In this case, the baby is occasionally touched and lacks the necessary responses. Based on scientific research, newborn babies who are born with selective cesarean section are at risk of 50% more asthma, 20% more diabetes and 50% more obesity. The results of studies in England have shown that the risk of maternal death from cesarean delivery is three times higher than normal delivery. During delivery, cesarean section babies lose significant bacteria in their stomachs, which can be reconstituted if they are breastfed up to 4 months of age. These bacteria are produced, but the loss of these bacteria can cause many problems Neonates born in the cesarean section are four times more likely to have lung-borne bacteria than the other infants and, therefore, are more likely to be admitted to as infants to the neonatal intensive care unit. In cesarean section, due to the lowering of cortisol secretion in the mother whose secretion of the hormone is due to the onset of labor pain, there is no chance of maturation of the baby's lungs. Short-term complications of cesarean section include:

**Clot formation in the arteries of the legs:** This clot is associated with redness and swelling and causes lung complications. If the clot is not treated, it enters the bloodstream and causes lung embolism. As a result of lung embolism, the patient also suffers from shortness of breath and it can be fatal. This clot is seen in obese women, especially those who have had multiple cesarean delivery or too much rest.

**Lack of weight, need for special care, gastrointestinal tract failure, jaundice and respiratory distress** can be long-term complications of cesarean section. Laryngeal congestion due to the use of anesthetic drugs, having uterine fibroids, women with large embryos or Twin or multiple pregnancies have been sequelae of cesarean section.

**In those who have a waters break, or secretions of infection,** there are symptoms such as fever, redness, swelling and contaminated discharge from the cutting site. With these complications, the mother needs re-admission.

**Mastitis:** Because milk is secreted later in mothers who have had cesarean section, mammary wounds such as nipple wounds or inflammation of the breast are more common. From the definitive and relative indications of cesarean section, during the delivery, the incongruity of the cervix with the pelvis is determined. Fetal distress means changes in the amount of fetal heart rate, indicating that

that its oxygen levels are not sufficient and volume of blood is excessive. The normal position is the placement of the embryo head-to-head inside the pelvis of the mother. If the embryo is transversely situated, there is no possibility of normal delivery. If the legs of the embryo are in the pelvis, sometimes there is a possibility of normal delivery, but caesarean section is the preferred route. If the placenta is discontinued or the placenta is placed on the cervix, the best way to deliver is by cesarean section.

Failure to recognize the type of cesarean section may cause uterine rupture during normal delivery, in which case the health of both mother and infant is threatened. It should be noted that the type of incision on the abdominal skin with the type of incision created on the uterus may differ, so that only the abdominal cavity cannot be detected in the uterus, so having a medical record with an incision on the womb is mandatory. For this reason, and due to the precautions required by physicians, in our country, usually a cesarean section often is selected. Early use of medications or contraceptive stimulants (over-the-counter) can slow the progress of labor and cause cesarean delivery. Premature and late (less than 38 weeks and more than 42 weeks) may cause complications. Embryos with problems with blood RH should be born with cesarean section. Sometimes the delivery of twins is performed naturally, but in most cases cesarean section is chosen as the best way. More than two pregnancies should end in cesarean section. Cases such as herpes simplex infection, high blood pressure, fibroid tumors, diabetes, maternal aids, and prolonged delivery pain are other than cesarean section. The history of the baby's death, the history of infertility and the first abdomen (over 35 years old) is also often associated with cesarean section.

#### **Vaginal birth stages:**

**Normal delivery stages:** The first stage of delivery is divided into "hidden" and "active" stages. (15) The hidden phase is generally a starting point in which the woman is aware of regular contractions of the womb. (16).

**The second stage:** Embryo withdrawal. The stage of deposition (stimulated by prostaglandins and oxytocin) begins when the cervix is fully developed and when the baby is born. Then the embryo head continues down to the pelvis, under the arc of the abdominal area and outside through the. The appearance of the embryo is called the "crown". At this point, some women can feel fatigue. (19) Stage III: The third stage is called labor. Plasma excretion begins as a physiological separation of the uterine wall. (20) Plasma exit can be controlled continuously, which allows the pair to be expelled without medical help. (21) The fourth stage is a period that begins immediately after the birth of a child and lasts about six weeks. (22) It is time for mother's body, including hormone levels and uterine size, to return to normal. (23) Outcome from normal delivery in some few women, and fear of childbirth can cause anxiety and emotional disturbances. While most natural births are simple, unforeseen complications such as maternal hemorrhage during delivery can occur. Pelvic rupture risk can increase the duration of recovery. In very rare cases, uterine inversion may occur. If this problem is not treated

in a timely manner, it can be dangerous and serious. If a wound or episiotomy occurs, the woman may feel pain in their sexual relationship for 3 months after the baby is born. (9) Pregnancy causes problems and disorders in the urinary system and feces. Problems such as bladder dyspnea, followed by frequent urination problems and, on the other hand, stool problems. Of course, these problems are not always present in normal vaginal delivery, although after natural vaginal delivery of these complications are more frequent. Bladder discomfort means changes that occur in the bladder area and cause the mother to have urinary incontinence in the coming years. Of course this may also be the case in those who have not even given birth, but more common among those who have more pregnancies (4 and 5 deliveries), especially if the delivery is natural. Infection and bleeding may be other problems of childbirth. Rarely a rupture of the pathway or excretion of the stool, as well as other complications may occur due to normal vaginal delivery. Some women attribute the fall of the uterus to normal or cesarean section, while in most cases it is due to faulty walking, false sitting and lumbar injuries.

#### **Short-term complications of normal delivery:**

Uterine contractions during delivery

Embryo, pressing the infant's umbilical cord during delivery: In this case, the mother may have bleeding during delivery. Bleeding up to 500 cc is normal. If the amount of bleeding is high and the mother is referred to a doctor late, the baby may die.

The change in the genital form, bladder dislocation, or rupture of the vagina, may occur mainly in women who have multiple births or have a large embryo.

Infection, high blood pressure, severe pain, is one of the methods of pain control, injection of medication into the muscle. The second method is the use of respiratory gases, and the mother's labor pain decreases slightly by breathing the gas. The third method is to create numbness through the epidural in the lumbar region. An anesthetic is injected into the epidural by using a narrow needle through the mother's spine, and a local anesthetic in the waist, which causes these complications. Anorexia injection in the epidural space delayed delivery, which means that if the baby is to be born within 6 hours, this time will change to 8 hours. Injecting an anesthetic causes the mother to not have the power to strain and the doctors use forceps to remove the baby. Physicians may remove the baby from the abdomen using a physical device called forceps or a suction device. This device should not be used by non-specialists, as it sometimes causes damage to the baby's brain and skull, as well as tearing of the mother's genital tract. Direct and unprotected direct local anesthetic for episiotomy of the mother may cause a newborn seizure. Oxytocin consumption can increase the risk of newborn jaundice and excessive consumption of it results in pulmonary contractions and anoxia in the newborn.

Complications of normal delivery in the newborn are more: long and hard labor, increased risk of mechanical lesions, and hypoxia.

With very short and fast breathing there is increased risk of intracranial hemorrhage and asphyxia. The births cause tachycardia and increased blood pressure and rarely anemia in the mother. Pain in the mother has been shown to decrease the blood flow of the uterus, and the blood of the neonate is lower.

## Method

The purpose of this study was to compare the complications after normal delivery after cesarean section and repeated cesarean section. In the United States, the overall rate of cesarean section increased from 4.5% in 1965 to about 25% in 1988. Approximately one million births (24%) are done in the United States through cesarean section. (29). In Iran, the prevalence of cesarean section was reported to be 82.8%, which increased to 96.64% in 1996. The prevalence of cesarean section in the years 1378 and 1379 was 32.3% and 34.8%, respectively. This is reported in higher private hospitals (30-31). With normal delivery after cesarean section, the number of cesarean sections can be reduced. In 1978, Gibbs and Marble reported that 83% of patients who had a history of cesarean section had a normal delivery without risk. Impi and Is, Impi and Oehrelli 1998 reported that even taking the most precise criteria for diagnosis of dystocia, the normal delivery rate after cesarean delivery reached 68%. Between 1996 and 1989, cesarean section rates declined in the United States, the main reason being the increase in natural birth after cesarean section (32-33). In a study conducted at the California Hospital in 1995, 61 percent of women experienced natural vaginal delivery after cesarean section, out of which 35 percent had normal delivery (5). Despite the advice of the College of Women, the prevalence of natural birth after Cesarean section is less than 7%, and this belief is that after a cesarean section, cesarean section is more often due to fear of complications such as uterine rupture (35-34). Uterine rupture is a life-threatening or risky condition for mother and baby whose incidence is less than 0.1% in pregnancy and in normal delivery, after cesarean section less than 1%, which is monitored carefully during normal delivery. The availability of staff and equipment to carry out an emergency cesarean can minimize mortality and morbidity. (36). The natural delivery over cesarean leads to less risk to his mother and baby. It allows mother to leave hospital as soon as possible and with less (37).

47% of mothers who were able to complete delivery / a total of 8 natural cases following cesarean section. From the maternal outcomes, the mothers of the normal delivery group had less constipation than those who had after cesarean section. There was no statistically significant difference between the two births. Today, because of the possible risks of cesarean delivery, many women who have been given cesarean section during their previous pregnancies are encouraged to have normal delivery, since normal birth has many benefits and risks as low as possible (38-39)

Some complications of normal delivery after cesarean delivery:

normal delivery fails, the 25% of women who choose normal delivery after cesarean delivery in their previous births cannot tolerate normal delivery. As a result an emergency cesarean section will be necessary. The risk of infection with the uterus, in emergency cesarean section, will be more than planned cesarean section. Because of the use of medications to accelerate the natural delivery process, it can sometimes cause severe contractions in the mother's womb, which may cause uterine rupture. This complication usually occurs along the previous delivery line performed by the cesarean section. However, in the case of rupture of the uterus before or during normal delivery, the mother will need an emergency cesarean section. Also, in some cases, cesarean section is essential to prevent any life-threatening complications such as blood loss, infections, or brain damage in the baby.

The benefits of vaginal delivery after delivery of cesarean section, include low postnatal infections, reduced postpartum hemorrhage, reduced bladder and intestinal injuries, and reduced mortality (40)

## Summary

Complications of Vaginal Birth After Caesarian (VBAC): VBAC complications t may be one of the causes of fear and concern of gynecologists and obstetricians for this type of delivery. Postpartum vaginal delivery of cesarean section benefits VBAC. Shorter maternity stay in a hospital (41) Reduced likelihood of infections (42-43) Reduced mortality

Reduce blood loss during delivery or after delivery (44)  
Reduce the likelihood of need for blood transfusions or blood products (41)

Reduce thromboembolic events (44) Reduce perinatal mortality to less than 1% (42)

Reducing interventions in the pain and delivery room (including decreasing the use of oxytocin) (43)

### Complications.

Rupture of the uterus (the most common complication) (44-45)

Increased probability of hysterectomy following uterine rupture (46)

Increased VBAC-induced injuries and accidents are an increase in VBAC-induced injuries and events of the fetuses, rupture of the uterus after vaginal delivery.

In a 2006 Cahill study in each group of VBAC and cesarean delivery, rupture of the uterus and rupture of the bladder and intestine, as well as uterine arterial injuries, were significantly lower in the VBAC group than in the cesarean group. Postpartum infection (fever) and the need for blood and blood products were significantly lower in the

VBAC group than in the cesarean group. The incidence of uterine rupture in the VBAC group was 0.4% in the study, compared with uterine rupture in the cesarean group (selective (0.6%) and statistically significant.) (10)

In the US Department of Obstetricians and Gynecologists In the lower segment of the laryngeal scar, it is possible that the tear reaches approximately 0.2% (47). In a study by Rageth in 1999, among 33,698 women with a history of previous cesarean section, 17,897 women (53.1%) were ready for vaginal delivery after cesarean section and 15,801 (49.9%) cesarean section.

(See: Table 3: Recommendations for vaginal delivery after delivery Cesarean section (conditions) VBAC delivery recommendations. Table 2: Complications of vaginal delivery after cesarean delivery. There is no definitive midwifery condition for performing definitive cesarean section (Breech, shoulder, twin, post-trauma, etc.). (48-49)

The incidence of erythrocyte rupture and uterine rupture symptoms among the VBAC group was about 0.7%, and this difference was not statistically significant in the CR group. In this study, the rate of fetal ischemia and hypoxemia was not statistically significant between the two groups.(16) The College of Obstetricians and Gynecologists recommended reducing the most important complication of VBAC, uterine rupture, in conditions such as the high number of previous cesareans of longitudinal or classic scars on the uterus Excessive uterine distension does not occur in this type of delivery. Postpartum Cesarean: Several studies have shown that 60-80% of women with previous cesarean section can easily have vaginal delivery, provided that the conditions mentioned by the American Association of Obstetric and Gynecological Obstetrics (ACOG). The individual and the care team are executed thoroughly and accurately. The requirements for this type of delivery (VBAC) are given in Table 3. Suggested VBAC Candidate Care Options: The American College of Obstetrics and Gynecology has developed and presented a series of supportive care measures for post-cesarean vaginal delivery that minimize the possible complications of this type of delivery by implementing these care programs. These conditions and care are given in Table 4.

Natural delivery after cesarean section: Today, because of the possible risks of cesarean section, many women who have had cesarean delivery during their previous pregnancies are encouraged to have normal birth because, as stated, normal labor has many benefits.

The most common VBAC complication, which may be one of the causes of fear and concern for gynecologists and obstetricians for this type of delivery, is rupture of the uterus following vaginal delivery.

Table 1: The benefits of vaginal delivery after delivery of cesarean section
<p><b>Benefits of VBAC</b></p> <ul style="list-style-type: none"> <li>Short stay mother's stay in hospital</li> <li>Reduce the likelihood of infections</li> <li>Reduce maternal mortality</li> <li>Reduce blood loss during delivery or after delivery</li> <li>Reduce the likelihood of need for blood transfusions or blood products</li> <li>Decreases the incidence of thromboembolism</li> <li>Reduce perinatal mortality to less than 1%</li> <li>Reducing interventions in the pain and delivery room (including decreasing the use of oxytocin)</li> </ul>

Table 2: Complications of vaginal delivery after delivery by cesarean section
<p><b>Complications</b></p> <ul style="list-style-type: none"> <li>- uterine rupture (the most common complication)</li> <li>- Increased risk of hysterectomy following uterine rupture</li> <li>- Increased VBAC-induced injuries and accidents</li> <li>- Increased vaginal and fetal events caused by VBAC delivery</li> </ul>

Table 3: Recommendations for vaginal delivery after delivery of cesarean section
<p>(Conditions) VBAC Delivery Advice</p> <ul style="list-style-type: none"> <li>- There is no definitive midwifery condition for performing a definitive cesarean section (breech arm, shoulder, twin, post term, etc.)</li> <li>- There are no symptoms of hip disorder (CPD).</li> <li>- Self-priming (cervical dilatation 4-3 cm).</li> <li>- Do not instigate or initiate labor pain and soothe the cervix with drugs such as prostaglandins and oxytocin (to reduce the chance of uterine rupture).</li> </ul> <p>Do not use gadgets such as Vacuum or Forceps for childbirth.</p> <ul style="list-style-type: none"> <li>- The fetal weight is less than 4000 grams (macrosomia not proved).</li> <li>- Term of gestational age (accurate diagnostic methods used to determine LMP).</li> <li>- The distance between the current pregnancy and the previous cesarean delivery is at least 24 to 19 months ago (a short interval in pregnancy can increase the chance of uterine rupture by 2-4 times).</li> </ul> <p>Cut the cesarean delivery as a low transverse (the lower segment).</p> <ul style="list-style-type: none"> <li>- The number of previous cesarean section is not 2-1 times higher.                     <ul style="list-style-type: none"> <li>There is no scar or rupture on the womb.</li> </ul> </li> <li>- The mother is ready during pregnancy and has received training in this type of childbirth.</li> <li>- There are no putative problems, such as a decollete.</li> </ul>

- Conditions that increase the likelihood of uterine rupture, such as multi-striae, macrosomy, Polyhydramnios , are absent.
- There are no medical and internal diseases in the mother (diabetes, obesity, hypertension, etc.)
- Have a history of once-in-time vaginal delivery.
- There are no muscle problems

**Table 4: Care of women with VBAC conditions**

**Care**

- Delivery is done in a well-equipped hospital
  - A well-functioning and active operational team including a gynecologist, pediatrician, anesthesiologist, midwife in the operating room, and more.
- Uterine contractions and embryonic heart rate are regularly recorded by the electrodes and, if urgent action is required, do this without waste of time. (Check every 10-5 times the monitor).
- Use local anesthetics and anesthetics to reduce maternal stress (pethidine and epidural).
  - Do not exacerbate labor pain (no induction).
  - The signs and symptoms of uterine rupture are monitored regularly (embryo heart monitoring, uterine contraction control, etc.) and, if uterine rupture is possible, laparotomy is performed immediately.
  - Apply to save blood for at least 24 hours.
  - The vital signs and hemodynamic status of the person should be monitored regularly.
  - Mental and psychological support of the woman in the pain and delivery room (especially by the spouse).

undeniable benefits will increase the likelihood of cesarean delivery (14). A review by Fatemeh Abbasalizadeh and colleagues in Tabriz in order to evaluate the women's desire for delivery after a single cesarean section showed that 67.5% of women tended to repeat cesarean section, the most common cause (88%) mentioned was less pain. While 32.5% of women tended to have normal delivery, 83% of them reported eating more comfortably after cesarean section (4). In a study conducted by Gamble et al. (2001) in Australia, the cause of women's cesarean section was the previous unpleasant experience of normal delivery, maternal anxiety and insufficient knowledge of the complications of cesarean section (15). In a study by Masoomah Ali Mohammadian and colleagues to examine the effect of mother's request on the amount of elective cesarean sections was conducted in Tehran hospitals. It found that the most common cause of elective cesarean section (73.5%) was repeated cesarean section (16). In the present study, 134 (52.9%) patients tended to repeat cesarean section. According to studies, 80-60% of women with previous cesarean section could have normal and normal delivery. In a study by Linda French and colleagues in Nova Scotia (1984-92), about 53% were able to have normal delivery (14). In a study conducted by Malyha Arab in Hamedan to evaluate the natural outcome after cesarean section, the results show that out of 81 deliveries no maternal deaths were reported and only 3 cases of postpartum complications were observed, while of 271 cases of cesarean section w 19 cases were observed after cesarean section (17). The results of this study indicate that complications after cesarean delivery are higher than normal delivery. The results showed fever in 36 cases, bloating in 13 cases, constipation in 3 cases, hysterectomy in 1 case and uterine and abdominal damage was seen in 1 case. While in normal delivery, only 1 case of fever was observed There were no complications in the womb and adnexa. Also, in the research conducted in Hamedan, the mean hospital stay was 2.8 days in the cesarean section and 1.1 days in the normal delivery group (16). In the present study, the duration of hospitalization in the two groups was 3.1 days versus 1.2 days. The most important complication of natural birth due to previous cesarean section is the risk of uterine rupture. According to available evidence, rupture of the uterus following normal delivery is in mothers who have had a transverse cesarean section is 0.5-1.2%. In the study of Linda French and colleagues, also reported uterine rupture in the natural delivery group at 0.3% (15).

**Conclusion**

The results of this study showed the need for precise selection of subjects for natural delivery after cesarean section and with care during delivery, normal delivery after to cesarean section has no severe complications and can be used to reduce unnecessary cases of natural delivery following cesarean section. Vaginal delivery after cesarean delivery is one of the most appropriate and scientific methods for controlling and reducing the selective and unreasonable cesarean section rate among women and thus reducing the risks of this type of delivery for the mother

The complications of VBAC are listed in Table 2. (16-19). Several studies have shown that 60-80% of women with previous cesarean section can easily vaginal delivery, provided that the conditions mentioned by the American Association of Obstetrics and Gynecology (ACOG) by the individual and the team Care should be taken thoroughly and accurately. (15) The conditions for this type of delivery (VBAC) are given in Table 3. (17-17 and 15), the American College of Obstetrics and Gynecology has developed and presented a series of supportive and care measures for vaginal delivery after cesarean section that, by implementing these care programs, it is possible to minimize the possible complications of this kind of childbirth. . These conditions and care are presented in Table 4. Currently, the most commonly used cesarean section rate in the United States is one million cases per year. In a study by Jazel et al. (2001) in Brazil, the percentage of cesarean section increased from 68.3 to 81.8 (13) during the study. The economic burden of cesarean delivery in the United States is twice that of normal births, and in addition, the length of stay and recovery time and return to work are twice as likely to occur in cesarean delivery. Various studies and studies have shown that, if there is no specific monitoring system for assessing cesarean section and normal delivery, normal delivery with all the

and the fetus. Therefore, in order to achieve these goals, women and midwifery professionals need to be aware of the conditions, benefits and goals of this type of delivery, and if necessary have the knowledge and awareness to do so. The results show that in the case of repeating of cesarean section, duration of hospitalization was less, so were complications following surgery.

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# The Relationship between Organizational Culture Based on Hofstede Model and Personality Assassination among Educational Staff in Yasuj University of Medical Sciences in 2017

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## Abstract

**Background:** Organizational assassination is an attempt to spoil the reputation of an individual. This practice involves disseminating misleading and exaggerated cases or dealing with facts in order to provide the wrong image of the person in question. The purpose of this study was to determine the relationship between organizational culture based on Hofstede model and personality assassination among educational staff of Yasuj University of Medical Sciences.

**Materials and methods:** The present research is a descriptive correlation study conducted in 2017. The research sample consisted of 100 employees of Yasuj University of Medical Sciences who were selected by purpose sampling. The data collection tool was Hofstede organizational culture questionnaire and Lehman personality assassination questionnaire.

**Results:** The results of the study showed that the mean age of the subjects was  $38.3 \pm 7.15$  (range: 25-59 years). 42.0% were male and 58.0% were female. 82.0 percent were married and the rest were single. In terms of jobs, 73 percent of employees are non-faculty and 27 percent have been employed as faculty. Also, the findings showed that "avoidance of uncertainty" was the dominant organizational culture among Yasuj University of Medical Sciences teaching staff. In addition, the subscale of "avoiding uncertainty" culture with a subset of "communication threatening behavior" was positively correlated at 99.0% ( $p = 0.002$ ), and there was no correlation between other organizational culture sub-scales with organizational subsidence ( $p > .05$ ).

**Conclusion:** According to the findings of this research, it is necessary to provide training on the consequences of the assassination of the personality of the workplace for all educational staff, including management, faculty members and staff.

**Key words:** organizational culture, personality assassination, Hofstede model.

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## Introduction

Organizations as the main pillar of the current community play a decisive role in meeting the expectations of communities, and human resources are the most valuable source for organizations. The physical and mental health of the workforce is one of the factors affecting productivity which, along with education, forms the two main axes of human capital (1). Several factors can affect the physical and mental health of employees and one of the possible factors involved in the stress of the organizational environment is the issue of assassination of the organizational personality. In recent years, research has focused on the field of organizational behavior by focusing on the study of a set of negative and destructive behaviors that act in the opposite direction to productive behaviors. The researchers tried to organize these behaviors in the form of one or more general concepts. The result of these efforts was to create the concept of diversion in the workplace or anti-production behaviors (2,3). Occupational counter-productive behaviors are voluntary behaviors aimed at harming individuals within the organization or the organization itself (2), which are collectively referred to as personality assassinations. In fact, organizational assassination or organizational mobbishness is an attempt to spoil the reputation of an individual. This practice involves disseminating misleading and exaggerated cases or manipulating the facts in order to present an incorrect image of the target person. In fact, the assassination of a person is a form of defamation, which can include, in addition to the person, family, and surrounding people. The assassination of the person has a historical background and has historically been used as an alternative to the physical removal of individuals. In this way, people who are endangering the interests of the individual or another group are being attacked by them in order to isolate and defame them (4).

The results of some of the research have introduced organizational climate as one of the most important advances in organizational mistreatment (5), which is closely related to organizational culture. In fact, organizational culture is the concepts, commonalities and shared patterns that have been learned and accepted at the group level and institutionalized by the members of the organization (6), which shapes the behavior of managers and employees at all organizational levels and organizational capabilities (7). Many researchers have identified organizational culture as a key factor in the success of organizations. The organizational culture system is not readily apparent, but its organization is well known, and in organizations, the law of culture is stronger than any other law (8). Therefore, considering the importance of organizational culture in the phenomenon of organizational assassination and the impact that this can have on the productivity and effectiveness of human resources, as well as the great role of organizational culture at all organizational levels, it is necessary to determine the relationship between these two.

Also, due to the fact that in order to develop human health, mental health of human resources has a special importance and among them, universities as the important pillar of development of every country are of special importance. The present study aims to determine the relationship between Organizational Culture based on Hofstede Model and Personality assassination among educational staff in Yasuj University of Medical Sciences.

## Materials and Methods

This research is a descriptive correlational study done on 100 employees of Yasuj University of Medical Sciences in 2017. The research environment of this research, the deputy of education affiliated to Yasuj University of Medical Sciences and its research community, was educational staff including staff and faculty members. The sampling method is available on a target-based basis. After obtaining permission from the Vice-Chancellor for Research in Yasuj University of Medical Sciences, firstly, staff who have criteria for entry into the study, such as having a bachelor's degree and above, having at least one year of work experience, and for each sample on how to conduct the research and the purpose for doing it they were given enough explanation, and if they were willing to participate in the research, they were given questionnaires. Data collection was done using two questionnaires. One of the questionnaires was Hofstede's organizational culture questionnaire, which has four dimensions including patriarchy versus femininity, individualism versus collectivism, avoidance of uncertainty and power distance. The questionnaire is based on a 5-point Likert scale (very low, very high), with a score of 1 to a very low option, and a score of 5 to a very high option. The questionnaire has 25 questions. The categorization of the answers of this questionnaire is such that the score of the phrases 1 to 9 is summed up and divided by the number 9 (MF). Score points 10 to 14 are grouped together and divided by number 5 (IC). The score obtained from questions 15 to 19 is also summed up and divided by number 5 (UA) and finally the score of the expressions is 20 to 25, and divided by number 6 (PD). The results of the questionnaire should also be interpreted. This means that if the score obtained from the MF is greater than 3, there is a patriarchal culture, and if it is less than 3, the female-dominated culture is dominant, and if there is 3, there is a balanced state.

Also, if the calculated score in the IC part is greater than 3, there is a collectivist culture. If the score is less than 3, the individualist culture exists and if the score is 3, there is a balanced cultural state. In addition, if the score obtained from UA (test) is greater than 3, the culture is avoiding uncertainty and if it is less than 3, a risk culture exists, and if there is a score of 3, the two cultures are in a balanced state. If the score obtained from PD is greater than 3, it indicates that the distribution of power in the community is unfair while the distribution of power takes a fair position if the score is less than 3. The score of 3 indicates an equilibrium between these two states.

The second questionnaire was the Lehman personality assassin's questionnaire, which has 45 questions and its responses are based on a Likert scale (very low, very high) with a score of 1(very low) until 5(very high). This scale consists of five categories, which means that questions 1-11 on "communication threatening behavior", questions 12-16 on "threatening social relationships," 17-31 questions refer to "behavioral threats to personal well-being, 32-40 questions" threatening job position "and Questions 41-45 refer to" threat to Physical Health "(9).

The reliability coefficients of this questionnaire were obtained by using alpha of Cronbach by Homayuni et al (2014) and Pinsif respectively of 0.96 and 0.90. Finally, the relationship between these two variables was analyzed by SPSS software using Spearman correlation coefficient, Chi-square and Kappa. Also, due to the fact that the organizational culture scores and corporate identity assassinations did not have normal distribution, the results of nonparametric tests have been reported.

## Results

In the present study, the mean age of the subjects was 38.3 ± 5.7 (range: 25-59 years). 42% were male and 58% were female. 82 percent were married and the rest were single. In terms of jobs, 73 percent of employees are non-Faculty and 27 percent have been employed as Faculty. The results also indicated that 50% of faculty members had a female-dominated culture and 45% had male-dominated Farhag , and only 5% had a balanced culture. In addition, 44% of employees have a female-dominated culture and 42% have patriarchal culture and the rest of the culture has a balance.

87 percent of employees and 85 percent of faculty members had a collectivist culture, and 98% of staff and 95% of faculty members had the culture of "avoiding uncertainty". In the culture of power distribution, although 44% of employees believed that power distribution was fair, 45% of faculty believed that power distribution in the organization was unfair. Chi-square and Kappa statistical tests did not show a significant statistical difference between the dimensions of organizational culture and the employment status of educational staff of the University of Medical Sciences (p> 0.05). Also, the findings showed that in the subscales of organizational culture, only the subscale of "anxiety avoidance culture" with a subset of "communication threatening behavior" was positively correlated with 99% (p = 0.002) and among other subscales of organizational culture the subscale of organizational assassination was not correlated (p> .05). Other results are presented in Tables 1-4.

**Table 1: Relationship between Dimensions of organizational culture and Employment Status of Educational Staff of Yasuj University of Medical Sciences**

Organizational cultural dimensions		Job		Employee		Faculty		Chi-square test		
		Percent	Number	Percent	Number	Percent	Number	Chi-square	Significance level	Kappa
MF	1	44	44	50	50	1.1	0.5	0.4		
	2	13	13	5	5					
	3	43	43	45	45					
IC	1	7	7	10	10	0.2	0.9	0.7		
	2	6	6	5	5					
	3	87	87	85	85					
PD	1	44	44	35	35	0.6	0.7	0.4		
	2	15	15	20	20					
	3	41	41	45	45					
UA	1	2	2	5	5	0.5	0.4	0.4		
	2	-	-	-	-					
	3	98	98	95	95					

The findings of the study show that the majority of men (61%) had male-dominated culture and, in contrast, 56% of women had a female-dominated culture. (Table 2 - next page). There is no significant correlation between gender and type of culture (P = 0.03). 87 percent of men, compared with 86 percent of women, had a collectivist culture (P = 0/7). 100% of women versus 93% of men have a culture of avoiding uncertainty and in terms of the culture of power distribution, 36% of men versus 47% of women have a fair distribution culture in organization and there is no significant correlation between gender and the three areas mentioned above in organizational culture (P> 0.05).

**Table 2: Correlation between organizational culture and gender**

Sex		Male		Female		Chi-square test		
		Percent	Number	Percent	Number	Chi-square	P- Value	Kappa
MF	1	32	32	56	56	7.1	0.03	0.3
	2	7	7	14	14			
	3	61	61	30	30			
IC	1	10	10	7	7	0.6	0.7	0.4
	2	3	3	7	7			
	3	87	87	86	86			
UA	1	6	6	-	-	0.2	2.8	0.09
	2	-	-	-	-			
	3	93	93	100	100			
PD	1	36	36	47	47	0.5	1.06	0.5
	2	16	16	16	16			
	3	48	3	37	37			

**Table 3: Average grades of organizational culture according to gender**

Sex		Mean	Standard deviation	Independent T-test	
				T	P- Value
MF	Male	3.1	0.7	2.3	0.02
	Female	2.7	0.7		
IC	Male	3.8	0.6	0.4	0.7
	Female	3.7	0.6		
UA	Male	4.2	0.8	-0.2	0.8
	Female	4.2	0.6		
PD	Male	3.1	0.7	0.08	0.9
	Female	3	0.6		

The findings of the table above show that there is no significant statistical difference between men and women in the mean scores of organizational culture areas except in the MF domain ( $P > 0.05$ ).

**Table 4: Average grades of organizational culture according to job**

Job		Mean	Standard deviation	Independent T-test	
				T	P- Value
MF	Employee	2.9	0.7	0.4	0.6
	Faculty	2.8	0.7		
IC	Employee	3.6	0.5	0.1	0.9
	Faculty	3.7	0.6		
UA	Employee	4.2	0.6	-0.5	0.6
	Faculty	4.3	0.8		
PD	Employee	3.1	0.7	0.2	0.8
	Faculty	3	0.5		

The findings of the table above show that there was no significant difference in the mean scores of organizational culture among faculty members and regular staff ( $P > 0.05$ ).

## Discussion and Conclusion

According to the findings of this study, "avoidance of uncertainty" was the dominant organizational culture among the staff of Yasuj University of Medical Sciences. This culture was still evident and dominant even if academic staff members and staff are distinguished from each other. Rashedi et al. (2012) investigated the characteristics of organizational culture among academic members of Hamedan University of Medical Sciences using the Hofstede model. They concluded the culture of the university was a balanced culture with a desire for masculinity, collectivism culture, low-taking risk prone and a fairly balanced distribution of power (10).

Avoiding uncertainty demonstrates the level of acceptance and tolerance of environmental uncertainty and ambiguity in different societies. In the societies with a high level of uncertainty avoidance, people do not tend to get involved with environmental uncertainty and reduce the risk of unstructured situations. Also, the possibility of structuring the activities in the institutional and national level is high in this culture. It should be noted that there are more written rules and procedures in this culture and the managers and staff are less risk prone (11).

Considering a relatively centralized approach in the Medical Universities in Iran, the nature of medical disciplines and the sensitivity of these disciplines in terms of dealing with the health and lives of people, the culture of avoiding uncertainty is acceptable. So that, the prevalence of this organizational culture would request such written rules for these prevailing conditions.

Also, the subcategory of uncertainty avoidance culture was highly correlated with the subset of communication threatening behavior at 99 percent level based on the results of this study. The culture of avoiding uncertainty demonstrates the level of concern and anxiety of individuals about uncertain future in the community or organization. Therefore, as it could result in the communication threatening distance it is necessary to provide training on workplace mismanagement with all employees including managers and staff at all levels.

This training should include a definition of thuggery, signs and the impacts associated with thuggery. Employers should organize regular workshops on mobsters using skilled foreign-speakers. The training should also include specific exercises to prevent thuggery. The training for management level should include the development of skills to identifying employee's conflicts and finding active ways to eliminate maladministration. The primary alerting signs of the thuggery should be learnt in these training sessions in order to help the supervisors at identifying the potentials for tampering situations (12).

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has been taken from the research project which has been confirmed at ethical committee of Yasuj University of medical science.

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# Evaluation of Quality of Work Life and its Dimensions in Iranian Higher Education

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## Abstract

**Objectives:** The purpose of this study was to evaluate Quality of Work Life (QWL) and its dimensions in a higher education institution Qom, Iran.

**Research Design and methods:** A descriptive and analytical research method was utilized. The Statistical population included all educational employees of Qom University during 2015-2016 academic year from which a sample of 240 was selected from 633 faculty members and employees of 6 faculties through stratified random sampling. The data collection instrument was QWL questionnaire adopted from Timossi et al. (2008). Face and content validity of the questionnaire was confirmed by experts and its reliability was estimated as 0.81 through Cronbach's alpha coefficient. The gathered data was analyzed through descriptive and inferential statistics.

**Results:** The findings showed in Qom University that QWL and its six dimensions (Safe and healthy working conditions, Immediate opportunity to use and develop human capacities and talents, Social integration in the work organization, Constitutionalism in the work organization, Work and total life space and Social relevance of work life) mean scores were lower than mid-level. The two dimensions of QWL (Adequate and fair compensation, Opportunity for continued growth and security) were higher than mid-level while the lowest mean was related to Constitutionalism in the work organization. Significant differences were also observed regarding demographic variables.

**Conclusion:** QWL is an increasingly important organizational factor in health facilities. Recognizing work life within the context of the entire life, and approaching employee wellbeing through workplace factors is debated and speculated under the umbrella title of QWL.

**Key words:** Quality of work life; dimensions; Faculty members; employees; Higher Education

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## Introduction

Higher education is the principal and main factor which addresses the requirement and challenges of industry and the society. The effectiveness and efficiency of the education industry is directly dependent on employees only because the substructure and technology is lesser required in comparison to other industries. On average, employees spend around ten hours daily at the work place, which is around one third of their entire life; this effects the overall employee's life. "Quality of Work Life (QWL)" is a human resource management concept which is used to recover the work life of employees. This in turn improves both the employee's family and social life. Today, QWL is regarded as an important dimension of the QWL. Moreover, a high QWL is crucial for organizations to attract and retain workers (1). QWL assessments of the organizational environment in accordance with a wide range of requests of their employees' wellbeing in the workplace can lead to career advancement (2, 3). QWL is the favourableness of a total job environment and working situations that are excellent for people in addition to the economic health of the organization (4). QWL is a philosophy, a set of values, which holds that people are the most important resource in the organization as they are truthful, responsible and capable of contributing valuable involvement and they should be treated with pride and respect (5, 6).

Once an organization offers QWL to their employees, it is a good indicator to boost its image in attracting and retaining employees. This is important as it indicates firms are able to offer a suitable working environment to employees (7).

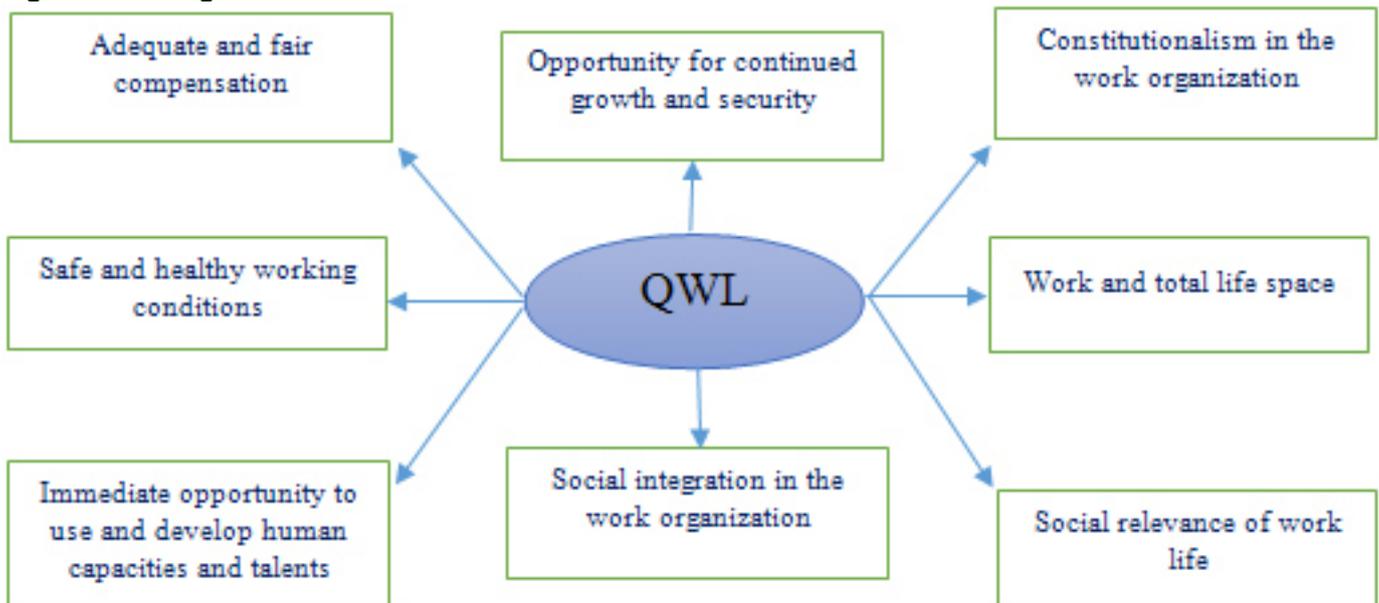
The aim of QWL culture is to generate a fear free organization in which employee involvement is pursued strongly. It generates a high grade of reciprocal commitment between the needs and development of the individual, and the aims and development of the organization (8). The evolution of QWL was created in late 1960s emphasizing the human dimensions of work that was focused on the quality of the relationship between the employee and the working environment (5, 6). Shamir and Solomon (1985) have defined QWL as a comprehensive construct that includes an individual's job-related well-being and the extent to which work skills are rewarding, fulfilling, and devoid of stress and other negative personal consequences(9). Sirgy et al. (2001) stated in their research that a new measure of QWL was developed based on need satisfaction and spillover theories. The measure was designed to meet the needs of an employee to capture the extent to which the work environment, job requirements, supervisory behavior, and auxiliary programs in an organization. They further explained that QWL differs from job satisfaction where by job satisfaction is construed as one of many consequences of QWL (3). Furthermore, QWL in an organization also concerns the contribution of workers in problem solving and decision making. Higher QWL would then connect with lower work-to-family interference (10). This review on the meanings of QWL indicates that QWL is a multi-dimensional construct. It is difficult to best conceptualize the quality of work life elements.

For instance, Casio (1992) determined that components of the qua QWL consist of employees' participation, job development, conflict resolution, communication, health, job security, equal compensation, safe environment, and sense of honor (2). Walton (1975) stressed that QWL was a significant approach to save human and environmental values which have been ignored due to technological advancement of economic growth and productivity (11). QWL was no longer a new issue in organizations because most past studies conducted by various researchers have proved that QWL was the most significant priorities that should be measured by an organization. Hackman and Oldhams (1980) mentioned that conceptual elements of QWL in relation to the association for work environment and employees personal needs. The work environment satisfied employees' personal needs that were considered to provide a positive interaction effect that will cause an excellent QWL (12). Work environment must be conducive as it is the place where employees will work and pass most of their time to do their work. Employees will still attempt to work hard to complete their task regardless of the workload when they find that their working environment is pleasant for them. If their salaries were better with good benefits that satisfied their personal needs they will stay and be loyal to the organization which is a good approach of employee retention in an organization. Walton, proposed eight main conceptual categories relating to QWL as (a) adequate and fair compensation, (b) safe and healthy working conditions, (c) immediate opportunity to use and develop human capacities, (d) opportunity for continued growth and security, (e) social integration in the work organization, (f) constitutionalism in the work organization, (g) work and total life space and (h) social relevance of work life (5, 6, 13). Walton pointed out that QWL emphasized humanistic values and social responsibilities and suggested the QWL was eight dimensional constructs as shown in Figure 1 (next page).

QWL defines satisfaction of employees in seven foremost needs and consists of: (a) Health and safety needs, (b) Economic and family needs, (c) Social needs, (d) Esteem needs, (e) Actualization needs, (f) Knowledge needs and (g) Aesthetic needs (3). Wyatt and Wah (2001) also stated that Asia emphasized to a lesser degree on QWL compared to North America and Europe because of few organizations working using QWL programs and few research papers published on QWL in the South East Asia regions (14). Certo (2004) believes that QWL is the degree of opportunity of employees to make decisions that impact their work condition. The greater the opportunity of workforces to make such decisions, the higher the quality of work life is said to be. Employees would like to make decisions, that tend to create the following:

- 1) jobs that are interesting, challenging and responsible;
- 2) worker rewards through fair wages and recognition for worker contributions;
- 3) workplaces that are clean, safe, quiet and bright;
- 4) minimal but available supervision;
- 5) secure jobs that promote the development of friendly relations with other system members, and
- 6) organizations that provide for personal welfare and

**Figure 1. The eight dimensional constructs of Walton’s QWL**



medical attention (15). Luthans (2005) consider QWL as an attempt to develop more satisfying work situations through the collaborative efforts of management and employees. Many popular QWL projects provide opportunities for growth in the workers’ personal and professional lives. Some popular QWL activities include problem solving meetings with representatives of management, labor and members of product development teams (16). Serey (2006) defined that QWL was connected with meaningful and satisfying work. It includes an opportunity to utilize one’s skills and capacities, to confront challenges and situations that require self-initiative and self-direction, an activity that should be practiced by the persons in organization (17). Muftah (2011) mentioned that QWL was one of the key areas of human resource management that is attracting attention and research focus. It is a philosophy that considers persons as the most important resources in the organization and views them as an “asset” to the organization rather than as “costs” (18). Hisk et al. (2010) indicated that by motivating communication between employer and employee, increasing experience to the working environment can improve self-efficacy and skill of more adaptive coping strategies (19). Gangly (2010) indicated that the selected group of university employees supposed different aspects of their QWL as uncongenial viz: Autonomy, top management support and worker’s control mainly or they had a certain amount of dilemma in commenting on a few other aspects such as personal growth opportunities and work complexity mainly bearing the potential involving a slight trend of negative opinion (20 ). Kumar and Deo (2011) did a study to measure the effect of stress on QWL of college teachers. Findings exposed that junior teachers had more stress than senior teachers. Also female teachers were feeling more stress in their job in comparison to male teachers (21). Arif and Ilyas (2013) focused on QWL of private universities. This study also explored the QWL effects on employee commitment, engagement, job involvement and reputation of the university (22). Therefore, the aim of this study was to examine the QWL and its dimensions at Qom University.

In this research, the scores of employees on the main factors such as adequate and fair compensation, safe and healthy working conditions, immediate opportunity to use and develop human capacities, opportunity for continued growth and security, social integration in the work organization, constitutionalism in the work organization, work and total life space and social relevance of work life, were analyzed.

**Methodology**

This research was a descriptive and analytical research method. The research population included all educational employees (Faculty members and employees) in Qom University; 633 individuals, where 240 individuals were chosen as the sample using Cochran’s formula.

$$n = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{1}{N} \left( \frac{z^2 pq}{d^2} - 1 \right)}$$

Data were gathered by one questionnaire: QWL questionnaire, consisting of 8 variables including Adequate and fair compensation, Safe and healthy working conditions, Immediate opportunity to use and develop human capacities and talents, Opportunity for continued growth and security, Social integration in the work organization, Constitutionalism in the work organization, Work and total life space and Social relevance of work life. The questionnaire contained 47 questions of which 29 questions were for determining QWL according to Walton’s theory with a five-point Likert scale (1=very little, 5=very much) used. To gather data from the respondents, an established measuring instrument was adopted and employed which was developed by Timossi et al. (2008) for QWL (23). To collect the data, the samples were chosen through simple random sampling. Of the 240 returned questionnaires, 5 were incomplete. The residual 235 valid

and complete questionnaires were used for the quantitative analysis. To verify the questionnaires validity face and content method and authority opinions were utilized. Reliability coefficient of questionnaires were estimated through Cronbach's alpha coefficient (Table 1). The questionnaires were distributed among the participants by the researcher who tried to attend for clarification if needed and after two weeks the questionnaires were collected by the researcher. According to the researchers' follow-up and participants' cooperation, 95% questionnaires were returned to the researchers.

### Ethical Considerations

The questionnaires were distributed among examinees by the researchers who tried to attend for clarification if needed. To observe morality in research, the examinee's agreement to participate was acquired. Impartiality and avoiding bias by the researchers, was achieved utilizing the newest informative and scientific resources, observing objectivity while analyzing data, and avoiding distortion of data and keeping the questionnaire data confidential.

### Data Analysis

Mean scores of the QWL were calculated through descriptive statistics. Besides, one way ANOVA, t-test, Fisher test and MANOVA were used to determine differences among them with demographic variables. The study used SPSS, version 21, and the level of significance was considered as 0.05.

## Results

69% of faculty employees, who participated in the research, were male, and 31% were female. 67% of the members who responded were age 31-40. 46.5% of the members who responded were Bachelor, 86% were married and 39.9% of faculty members, who participated in the research, had a 6-10 year working background.

According to the result, in Table 2, the mean score of the QWL and six dimensions were less than mid-level, and Social integration in the work organization, highest mean score was  $2.50 \pm 0.506$  and Constitutionalism in the work organization the lowest mean score which was  $2.23 \pm 0.680$ . The two QWL dimensions where mean scores were higher than mid-level were: Adequate and fair compensation mean score at  $3.21 \pm 0.960$  and Opportunity for continued growth and security mean score at  $3.13 \pm 0.947$ . ( $P < 0.001$ ). (Table 2 - next page).

According to the findings of multivariate analysis (MANOVA) showed that observed F at confidence level of  $p \leq 0.05$  for QWL dimensions according to demographic characteristics was significant. Eta square for age was not significant. But Eta square for sex, working background, married status, and grade was significant (Table 3).

According to findings of table (3), LSD test results identified that Social relevance of work life in married employees was more than in single employees, Opportunity for continued growth and security to grade employees with MS grade were more than those with Bachelor grade. LSD test results identified that Social relevance of work life to sex of employees with males more than with females and Adequate and fair compensation to working background of 15-20 years were more than those with 5-10 year working background. Furthermore, LSD test results identified that QWL dimensions in Faculty members were more than those of employees of the Faculty.

**Table1: Variables' alpha coefficients**

Variables	Cronbach's alpha coefficient
Adequate and fair compensation	0.85
Safe and healthy working conditions	0.71
Immediate opportunity to use and develop human capacities and talents	0.82
Opportunity for continued growth and security	0.91
Social integration in the work organization	0.83
Constitutionalism in the work organization	0.80
Work and total life space	0.72
Social relevance of work life	0.83
QWL	0.81

**Table 2: Mean and Standard deviation of QWL dimensions ( =3, df = 239)**

Variables	$\bar{X}$	S	$\bar{X}_d$	t <sub>ob</sub>	P
QWL dimensions	2.33	0.816	0.051	11.32	<0.001
Adequate and fair compensation	3.21	0.960	0.088	8.45	0.008
Safe and healthy working conditions	2.42	0.819	0.057	5.41	0.004
Immediate opportunity to use and develop human capacities and talents	2.37	0.841	0.061	10.57	<0.001
Opportunity for continued growth and security	3.13	0.947	0.092	8.31	<0.001
Social integration in the work organization	2.50	0.506	0.066	6.05	<0.001
Constitutionalism in the work organization	2.23	0.680	0.063	4.11	0.002
Work and total life space	2.30	0.602	0.087	5.22	0.003
Social relevance of work life	2.48	0.729	0.097	7.45	0.007

**Table 3: Paired comparison of Mean Differences and standard deviation of QWL dimensions**

QWL dimensions	Demographic Variables	Mean Differences	Sig
Work and total life space	married status married and single	0.9612	0.005
Opportunity for continued growth and security	grade MS and Bachelor	0.4302	<0.001
Social relevance of work life	Sex male and female	0.7915	0.006
Adequate and fair compensation	working background 15-20 year and 5-10 year	0.3482	<0.001
QWL dimensions	Educational employees Faculty members and employees	0.679	<0.001

**Discussion**

A new world can be built by young brains and educational institution employees have a major contribution for nurturing, and educating these brains. The educational employees' working life and environment play a major role in their life. QWL is important to organizational performance and it is an important factor that affects employee motivation at work (13).

Research results showed that QWL dimensions mean such as safe and healthy working conditions, immediate opportunity to use and develop human capacities, social integration in the work organization, constitutionalism in the work organization, work and total life space and social relevance of work life, were lower than mid-level and QWL dimensions mean such as adequate and fair compensation, opportunity for continued growth and security were higher than mid-level. And so, research results showed that Social relevance of work life in married employees was more than in single employees, Opportunity for continued growth and security to grade employees with MS grade were more than those with Bachelor grade. The results identified that Social relevance of work life to sex of employees was

more with males than those with females and Adequate and fair compensation to working background with 15-20 years was more than those with a 5-10 year working background. Furthermore, the results identified that QWL dimensions in Faculty members was more than those employees of Faculty.

Results of this study are almost compatible with a study that showed that the selected group of university employees perceived different aspects of their QWL as either uncongenial viz. Autonomy, top management support and worker's control mainly or they have had a certain amount of dilemma in commenting on a few other aspects such as personal growth opportunities and work complexity mainly bearing the potential involving a slight trend of negative opinion (20). Kumar and Deo (2011) did a study to measure the effect of stress on QWL of college teachers. They took 100 college teachers of universities of Bihar and Jharkhand and studied their different perceptions of QWL. Findings exposed that junior teachers had more stress than senior teachers. Also female teachers felt more stress in their job in comparison to male teachers (21). Arif and Ilyas (2013) focused on quality of work life of private universities in Lahore, Pakistan. They explored various dimensions of QWL which affected life and the attitude

of teachers. This quantitative study took 360 members of university and analyzed their perception of QWL. This study also investigated the QWL effects on employee commitment, engagement, job involvement and reputation of the university (22). This research suggested that the perceived value of work, work climate, work-life balance and satisfaction are the main factors which shape the work attitude and also improve employees work life. Therefore, the educational employees (Faculty members and employees) feel that the University leaders do not: make any attempt to eliminate unsafe and unhealthy working conditions, provide immediate opportunity to use and develop human capacities, social integration in the work organization, constitutionalism in the work organization, work and total life space and social relevance of work life in the organization. However, this perception exists and the management should take some measures to persuade the Faculty members to express their beliefs where they feel that the senior manager value their beliefs and managers should pay attention to it to increase the QWL dimensions. In order to justify this finding, it could be said that if senior managers encourage educational employees to freely express their opinions, so they have to create the ground for more participation in the organizational duties. There are some limitations of this study. It should be noted that the generalizability of the research results may be limited to educational employees' university population. This study was conducted in Qom University, so these results cannot be generalized to all universities in Iran. Secondly, the data collecting instrument was questionnaire; thus, a common method bias may be present.

## Conclusion and Recommendations

An educational institution is made up of people who possess skills, ability and aptitudes that create a competitive advantage for it. Various functions of an institution are planned, executed and controlled by human resources. So it is essential for the educational institutions to provide proper management of human resources in order to achieve their objectives efficiently and effectively. The management of human resources plays a key role in opening up new opportunities for promoting the growth of both individual and institution. Through 'Quality of work life' an institute works in the same direction. Now-a-days, jobs are so demanding that, they imbalance the family and work life due to job pressure and conflicting interests. So it is essential for the educational institution to develop a better and effective working environment, where employees should be treated as a key element rather than working as a machine. In order to attract and retain

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# Effective Factors of Professional Ethical Competency in Medical Students: A Qualitative Study

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## Abstract

**Introduction:** Attaining ethical competency for medical practitioners, especially physicians, is one of the critical concerns for the education and management system. The competency related factors rely upon the context and culture physicians live and train in. Therefore, it is necessary to initially identify the factors to improve ethical competency.

**Objective:** This qualitative research was carried out to study the effective factors of professional ethical competency in medical students through using participants' life experiences.

**Methodology:** The research was qualitatively conducted. Research data were collected following written informed consent. 14 participants who had experience in teaching medical students were semi-structurally interviewed. Data were analyzed using conventional qualitative content analysis method. Data reliability and validity were verified using Lincoln and Guba criteria.

**Results:** Three groups were extracted in the study according to participants' experiences, including comprehensive recognition, ethical development supporting climate, and comprehensive role model training.

**Discussion:** Directing students to know the self, profession, and culture, followed by improved social and economic communications in the organization, as well as enhancing ethics contribution in educational assessment, and emphasizing ethical models may pave the roads to the ethical competency of a physician. It is recommended that policy makers adopt a holistic view in medical instruction.

**Key words:** Professional Ethical competency, physician, qualitative study

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## Introduction

Despite the significance of professional ethical competency in medicine, evidence reveals that medical students' education mainly focuses on technical aspects rather than ethical dimensions(1). Technical capability may not turn an individual into a proficient, influential physician without ethical competency. Ethical competency is indeed the capacity and commitment to protect the rights of patients and the families such that technical and specialized ability is part of the patient's request and rights(2).

Professional ethical competency is often recognized as professionalism; it is also largely emphasized in a prospective physicians' education and institutionalized (3). A professionalism-based act may cause improved relationship between physician and the patient. Ethical competency magnifies a physician's satisfaction and meanwhile improves health care team communication [4]. It is shown that students' professionalism influences patient care. On the other hand, unprofessional behavior and absence of values among students is related to medical students with burnout (5).

Professional ethical competency is defined through two approaches including character-based approach and an approach concentrating on visible performance and professional behaviors [6]. The two are sometimes combined to provide a more comprehensive definition; in better words, professional ethical competency is indeed considered as a professional way of conducting oneself based upon values and commitment [7]. However, the relationship between professionalism and humanism is such that they are interchangeably used. It is generally believed that professional values are prioritized to behavior. But they are typically mixed. However, human values and professional conduct may literally overlap in definition, some believe that human values play the central role and are more important than professional behavior [8].

To operationalize ethical competency of physicians, some clinical instructions are often used containing values and behaviors. A Virtue oriented school asserts that human values must be centrally considered in all professional activities. In other words, freedom, dignity, value, and personal opinions are required to be respected and individuals' difficulties and needs are removed through sympathy and no contempt. Modern medical ethics refers to the significance of human values and virtues and introduces leading virtues of medical ethics [9].

The main message of ethical competency is that the client is ensured of the physician's fair and honest effort, accountability, and correct observance. Therefore, professional conduct and accountability are critical dimensions of professional conduct. According to the present professional ethics, conduct is categorized as behavior to self, behavior to the patient, behavior to colleagues, behavior to the community or social accountability [10]. In this regard, ethical competency is regarded as an institution to organize physician's social behavior. As a result, social development of medical practice is associated with the practitioners' ethical competency.

Improving public health is directly related to the capability and effect of medical practitioners. Since professional ethics competency of health care providers is critically important in enhancing public health; thus, it is of significant interest to experts and scholars in many health affiliated professions by. Current medical students are the future physicians who significantly contribute to public health development; further, profession ethical competency of medical students may result in proper outcomes for patients, society, and the profession; thus, it is largely necessary to pay attention to the development of ethical competency in medical students.

As ethical competency is a social issue, it is viewed differently relying upon various social contexts and variable social values in different cultures and communities [11]. Therefore, research requires that social values of various communities are recognized. Few studies have examined effective factors of ethical competency in the medical profession [2]. Hence, the present qualitative research intended to study how Iranian medical lecturers recognize effective factors of professional ethical competency in medical students. A qualitative study can provide useful information of a community, which is unique regarding any particular community culture and context.

## Method

We performed this research to study factors affecting the medical professional ethics from the perspective of clinician teachers. Therefore, 14 clinician teachers with medical ethics teaching experience from two medical faculties of Tehran and Qom, were selected for interview.

All participants were informed about the purpose of the research. The participation was voluntary, and confidentiality and anonymity was maintained at all stages. The main questions were asked focusing on development of professional ethics, their experience of working with students, and their view on factors affecting professional ethics. Each interview was recorded and lasted between 40 to 60 minutes (with an average of 50 minutes), and then transcribed verbatim and analyzed before the next interview. This stage was continued until data saturation was reached.

We used qualitative content analysis in this descriptive study. This approach helps the researcher to explore and interpret the data and explain the great and major themes of the participants' perspectives. (7). Data analysis used in the present study was based on methods described by Graneheim and Lundman (8). In this study, MAXQDA software was applied to improve the classification procedure and continue data comparison.

To establish credibility of data, interaction, close relation and sufficient collaboration were done with participants. Also peer check and continuous comparison were performed. Data dependability was established using experts' review, and revision was done by observation of participants by an outside reviewer. To obtain adequate conformability, the researchers tried to avoid advance judgment and not interfere with previous beliefs. Transferability was prepared by complete explanation of data.

## Results

Effective factors of students' ethical competency achievement of research participants in Iranian medical instruction context are as follows:

In Iranian medicine instruction, effective factors of professional ethics are categorized into three major classes: comprehensive recognition, ethical development supporting atmosphere, and a comprehensive model-based educational system.

### 1. Comprehensive recognition (awareness):

the physician requires recognition to achieve ethical competency. The recognition may result in ethical competency if it is deep and comprehensive. The recognition dimensions based on research participants' experiences are as follows:

#### Self-awareness

According to the participants' experiences, self-awareness may be an introduction to the professional ethics for medical students. The participant professors named some values and virtues, which may lead to ethical competency through institutionalization. One of the participants with 12 years of work experience claimed that "a student gradually self-recognizes some capacities like high tolerance and the ability to identify and to develop peace, and self-control power in delicate, difficult occasions".

The participants confirmed that a medical student may endeavor to raise the value of professional ethics if he/she considers ethical aspects in treatment and attains self-awareness:

"Medical students must firmly trust in god, be purposive, and seek for spirituality rather than material issues. They are supposed to study and ask questions of experienced teachers in order to remove the ambiguities rather than wasting time. Medical students are disallowed any retreat in studying, burnout and frustration; rather, they are expected to pursue the objective of helping sick patients".

#### Professional awareness

According to experiences of research participants, recognition of the medical profession values is the introduction to strengthen professional ethics in medical students.

One of the participants believed that "the first step is to recognize and love the profession associated with intrinsic motivation and academic effort for science rather than other objectives such as earn money, position, etc."

Another participant, referring to the significance of profession awareness, expressed professional duties and boundaries, "to be ethically qualified in medicine, a student may require being adequately aware of their profession, what are their duties, and how the profession interacts with various other groups".

### Cultural awareness

According to research participants, Iranian cultural awareness with a proud history of civilization and medicine is the requirement of achieving professional ethical competency; additionally, cultural awareness makes the physician respect other nationalities and culture.

One of the professors highlighted the role of medical history in Iran and stated that "physicians were called Hakim in Iranian medical history since they had other necessary requirements in addition to the science".

Another participant indicated that "women in Muslim communities wear the hijab and expect visiting by female physicians (minimal contact with male physicians). Indeed, privacy should be respected".

"The community culture should be preserved in appearance and conduct. Some acts are not accepted in our culture like long hair for men. I think traditional medicine may provide a Hakim who is proficient and preserves social and ethical consideration as well", declared one of the research participants.

Research participants asserted that medical students must consider community culture in social behaviors, way of clothing, and communication, and act according to the common culture. It is necessary to observe way of clothing based on the community in order to prevent any annoyance or surprise for patients and clients.

### 2. Ethical development supporting climate:

to attain ethical competency, a physician needs to be located in a pro-ethical context. Ethics supporting environment embraces organizational climate and social support, which may lead to professional ethics if properly formed.

#### Organizational atmosphere

Organizational climate is another effective factor of professional ethics. Ethical atmosphere provides the opportunity for professional ethical conduct. The ethical theme would penetrate social institutions of the organization trying to develop ethics.

One of the participants mentioned the positive role of university and hospital in inspiration "at a university or hospital where professional ethics are valued, the individuals are encouraged to strengthen this feature".

According to another participant, "disordered university schedules and messed up curriculum of medical faculty are transferred to the student-teacher and student (future physician) - patient relationship".

Participants' experiences demonstrated that when an organization is accustomed to unprofessional ethics, the individual may gradually lose ethical sensitivity over time.

One of the teachers reminded of the effect of organizational ethical environment and asserted that, "in case that observed professional ethics or failure to observe the professional ethics is not welcomed by any system reaction; so, does it really matter to observe ethical issues?"

### Healthy socioeconomic structure

Social relationships influence professional ethics. Experiences of research participants reveal that the social system may provide the required opportunity to develop professional ethics for different individuals including medical students.

“If the society properly supplies socioeconomic conditions and if politics observes ethics; then, observed professional ethics would be promising”, one of the participants related.

According to the experience of another participant, “a friend of mine with moral and altruism spirit, recently finished surgery residency, and started working at a hospital. He was newly married and was looking for an inexpensive house. As he was unable to afford it, he started receiving a bribe”.

Another participant believed that “proper financial support during study, providing proper training to learn how to interact with others, and transferring ethical and professional experiences, etc. significantly contribute in enhancing professional ethics among students” in addition to the effect of social and economic systems.

The role of family in establishing professional ethics among physicians must also be regarded in social substructures. Of the issues emphasized by participants was the effect of family in child rearing and institutionalizing individual virtue. In fact, family as a model critically contributes in the acquisition of moral virtues and vices. “Moral characteristics such as courage, generosity, honesty, and trust, and the like are inherited from parents. Moral vices like lies and betrayal may be learned from family, which largely influence future professional ethics”.

**3. Comprehensive model-based educational system:** to train a professional ethically competent student, a facilitative educational system is required. According to the experiences of research participants, an effective educational system is characterized as follows:

#### A holistic educational system

Almost all participants considered holistic, comprehensive education. Excessive particularism is one of the disadvantages leading to the absence of ethics in different sciences. Medical education not just means learning medicine; rather, a physician needs knowledge of other associated sciences including ethics to develop professional ethical competency. One of the participants thinks that, “according to “Summaries of wisdom”, a physician must be proficient in another 10-12 sciences in addition to medicine, including ethics, wisdom, Jurisprudence and hadith, logic, geometry, astronomy, etc. and the materials taught today at universities are inadequate”.

Another participant believes that “in addition to the medical knowledge and expertise, familiarity with medical philosophy, visiting psychology, and in general, a comprehensive education system is required”.

### Continuous and comprehensive evaluation

Development of professional ethics of the current medical students and prospective doctors depends on diagnostic, developmental, and incremental evaluation. The medicine entrance exam does not ensure individual ethical competency; rather, it is permanent evaluation, screening, and sensitivity that create a professional physician from a non-professional individual. One of the participants declared that “medical application just through entrance exam is improper; instead, personal interview is also required to understand how much the individual is ready for this profession. In medicine, the students must be evaluated both at the onset and over the period”.

Evidently, instruction, even ethical instruction, may not suffice in developing ethical competency in medical students. The student must always feel under assessment and surveillance such that the professional ethics are institutionalized. Feedback of permanent assessments may lead to developing professional ethics.

One of the participants experienced that “continuous ethical evaluation with students’ feedback is required in addition to academic effort for professional ethics and using rewarding mechanisms”. Cultural and social foundations of Iranian universities call for team and interdisciplinary assessment of professional ethics in medical students in order to attain a comprehensive evaluation. One of the participants noted in regard to the efforts made to find a proper evaluation approach along with other teams, “there has been much doing on how to evaluate ethical behavior of medical students. Professors and residents are involved. Clinical groups were involved in a workgroup. It is necessary to consider what framework is appropriate for ethical assessment of the students?”

#### Role modeling

Another existing effective factor in the educational system is teacher (professor) as the student model. What the student learns in the area of profession ethics is largely influenced by teachers. However, teacher also have some negative effects in addition to the positive effects. In other words, teachers’ proper conduct causes professional ethics promotion; while, inappropriate behavior may lead to justified unprofessional behavior in students. Referring to the positive measure that one of the teachers adopted, “for instance, one of the colleagues returned the extra money granted for an approved proposal as it was not used in that project”, one of the participants narrated.

Another person mentioned a humanitarian characteristic of a physician who was known as a perfect model, “an internal medicine doctor visits inpatients at night without any benefit, due to accountability”. One of the participants believes that experienced, qualified physicians may also ignore professional ethics and irritate the patient, “we do not expect the physician to insult the patient”.

Some participants witnessed unethical behaviors of the physician that negatively influenced medical students, for instance, “an orthopedic patient who had paid for a planned surgery was rejected by the surgeon asking for extra

money. The surgeon said that diagnosis and operation requires more than the agreed amount; otherwise, there would be no operation”.

## Discussion

The present research studied effective factors of professional ethical competency in medical students and were classified according to the participants' experiences in the Iranian context. In the following, research effective factors are discussed.

### 1. Comprehensive recognition

Recognition is the first effective factor of professional ethics, which is classified into three subdivisions: self-recognition (self-awareness), professional recognition (profession-awareness), cultural recognition (culture-awareness).

The research highlighted self-recognition. Self-awareness is referred to being aware of motivations, desires, and abilities of the self. It can be stated that self-awareness is the foundation of professional ethics. It is critically significant in accountability and encouraging medical students' motivation [14]. In addition, self-awareness also causes reduced anxiety among students, and finally, patients get better care [15]. The self-awareness dimension has individual features as well as moral values and virtues that significantly contribute to professional ethics. Today ethical character is increasingly of interest. It is of important factors such that a character-oriented approach is created even in medical ethics and professional ethics instruction, which may develop a new acceptance in the students [16].

The second step, after self-awareness, is the profession-awareness emphasized in the research. The medical student should be aware of medicine, its characteristics, and interaction with other health team members. Significance of professional identity is cited in different articles meaning that the student as a prospective doctor must know how to be and how to interact [17]. If the individual achieves that level of awareness and professional identity is formed, it may be expected that professional ethics competency is also attained. That is why numerous articles have highlighted the significance of professional identity in medicine instruction [17-20]. It is worth noting that medical practice in Iran, regarding the history and characteristics, requires it to be introduced by known physicians such as Avicenna introduced to medical students.

The third recognition to reach comprehensive awareness is the society and culture recognition. The finding indicates that professional ethics-based behavior is obtained by cultural awareness and cultural respect. However, different cultures share common features. For instance, values like humility, truth, honesty, patience, and commitment are not merely dedicated to the Jewish or Christianity faiths; rather, are acknowledged in other cultures, too. For example, the holy Quran repeatedly referred to these values. However, cultural differences largely influence professional ethics. Decision-making authorities in European/ American communities versus

east-Asian communities is an important example. Western communities esteem individual autonomy; whereas, family autonomy is dominant [21]. Islamic culture also embraces some values health care crews need to know, the most important of which is to avoid interacting with the opposite sex, especially for women. Female patients are expected to be visited by a female doctor or nurse; or interact with male physicians as little as possible. In addition, Islam forbids alcohol and ham. However, this may be violated in emergency [22]. In Islamic communities, a physician is expected to have other features in addition to professional ethics including faith, conscience, good character, perfect performance, and accountability. Therefore, it is required that medical students achieve cultural competence and behave along the values of community culture, which are largely facilitated by education [23].

### 2. Ethical development supporting climate

An Ethical supporting climate plays a critical role in founding and development of professional ethics. Some believe that professional behavior not only stems from individual character, but also, more importantly, it originates from the context where the individual is trained. The research categorized ethics atmosphere into two classes of organizational climate and healthy socioeconomic structure.

Organizational climate may lead people to professional ethics. The significance of ethical organization is increasingly cleared in developing professional ethics. A healthy organization significantly contributes in ethical performance of organizational members through preventing or encouraging. Therefore, organizational policies and supporting them may effectively influence a tendency toward professional ethics [24]. A study, conducted on Korean physicians, inferred that the physicians prioritize ethical duties such as accountability and truth over ethical values like honesty and kindness because of government's health system pressure [3]. Context is an effective factor in professional behavior. It consists of three environments of clinical, university, and virtual environment. Clinical context is more important and has a greater impact on professional behavior [25, 26]. It is necessary to note that the organization may have a negative effect, too. At present, public trust in health care institutes is endangered due to health management mechanisms as incentives of some health care institutions have caused some limitations for physicians in terms of care quantity and quality [9].

The present research concluded a healthy socioeconomic structure as a professional ethics factor. Ensured health of social and economic structures may direct all social classes, including physicians, to ethical issues rather than trying to make money because of future uncertainty. Regarding that students undergo financial difficulties or mental distress during long study, guaranteed social and financial support significantly contributes in reducing anxiety and developing professional ethics. Uncertainty may make the individual look for his own interests, ignoring the patient's interest, which leads to violating professional ethics. Therefore, it is recommended that governments increase payment to enhance professionalism in young physicians [2]. On

the other hand, medical students endure lots of stress because of the nature of medical practice. According to a study, fresh students showed increased anxiety, decreased academic motivation, and social life maladjustment [27].

Furthermore, psychological distress increased in medical students comparing other age groups [5]. Different research has discussed the issue using the term well-being. Well-being means that an individual physically, mentally (psychologically), and socially, feels healthy. Students' well-being decreases stress and consequently leads to enhanced professional ethics. Studies demonstrated that mental well-being is largely related to residents' empathy, one of the important dimensions of professional ethics [28]. It seems that adjusting and removing financial relationships between physician and patient as well as a fair structure may improve professional ethics.

### 3. Comprehensive model-based educational system

If a combination of ethics, technical issues, and medical expertise is considered in the curriculum, it would certainly help in developing medical ethics. The curriculum must consider ethical instruction in addition to the medical knowledge and expertise.

The research explored comprehensive model-based education through continuous comprehensive evaluation and enhancing role model; moreover, it is also provided as a medical students' professional ethics development factor. Education is realized through formal training (classes), informal training (workplace and clinic), and hidden training (models) [29]. Clinical training plays a critical role in students' attitude such that clinical students and pre-clinical students differ in perspectives. Further, universities' approach also influences students' perspectives [1]. Clinical experiences of early years may cause prospective professional responsibilities' awareness for students and encourage ethical values. That is why medical students, around the world, are early exposed to clinical experiences [30].

Comprehensive education is not merely dedicated to the medical students; rather, almost all curriculums are interested in it. However, the education success varies in different centers. Some medical universities in the world teach medical humanities including humanities, social sciences, and art, which develop empathy and improve physician-patient interaction, and constructively influence private and professional values [31]. Medicine associated fields like nursing also refer to comprehensive training for nurses. In addition to nursing knowledge, physiology, and anatomy, virtuousness must be aware of ethics, psychology, economics, as well as sociology [11].

The present research provides targeted and directed evaluations. Students often organize learning relying upon the tested and assessed content. Thus, the present research reveals that if students' assessment considers ethics beside academic and specific issues; then, professional ethics is probably enhanced. Evaluation is important since it gives some knowledge of the current status to the individual or educational authorities; as a

result, it is necessary that medical curriculum concerns professional ethics evaluation [32]. Students' performance is intensified through reliable valid measurements of professional ethics. Different studies suggested various tools and measures to assess professional behavior [33]. Evaluations recently concentrated on behaviors rather than attitudes as behavior and attitude may be irrelevant due to the context effect [29]. However, professional behavior is a complex issue demanding frequent measuring in various learning contexts through a combination of different methods and instrumentations [6].

The issue of teacher role as a model is obviously clear-cut. Teachers (professors) are not only clinical models for students, but also largely influence developing ethical competency in students through ethical knowledge and ethical conduct. Thus, according to many research findings, it is accounted for as an effective factor of professional ethics learning. Role modeling is effective in teaching and learning professional ethics, particularly in the clinical context [26]. In a study conducted on medical students, facing good doctors and negative models caused increased and decreased interest into medical ethics, respectively. In fact, the physicians involved in teaching were viewed as models in medical ethics training, even if they were not teaching medical ethics [34, 35]. In a qualitative study, students indicated role model as the greatest factor of learning professional ethics. The model contained teacher in classroom, peers, and clinical practitioners. The research pointed out peer role as model and teacher role as negative model [36]. However, teachers or peers are not the only models; rather, residents, nurses, and other health team members may act as a model, too [37]. Moreover, model also is the significant factor in establishing students' professional identity [35]. A model aids in forming professional identity for a medical student, in addition to teaching medical knowledge and proficiency, to enter into medical work as a doctor [25]. Other studies also focused on the significance of clinical teachers beside the patient bed in students' professional identity [38]. However, some behaviors of the teachers may influence students as negative models [39]. Therefore, it is recommended that teachers and residents watch carefully how they interact with colleagues as it improves students' behavior [40,41].

## Conclusion

The current study uniquely organized effective factors of medical students' professional ethics in Iran, which may be utilized in educational, managerial, and service systems. The factors were classified as awareness, organization role, and comprehensive role-based educational system. Medical professional ethics is facilitated by managing and organizing the aforementioned classes through managerial-educational institutions. However, further studies may explore detailed effective factors and interventions' efficiency.

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# The Effect of Self-Regulatory Learning Strategies on Academic Engagement and Task Value

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## Abstract

**Background and objective:** Regarding the positive effect of self-regulation strategies on academic achievement, the purpose of this study was to investigate the effect of training self-regulatory strategies based on Pintrich's model on academic engagement and task value of high school students.

**Materials and methods:** This study is quasi-experimental with pre-test and post-test with control group design. The statistical population of this study was all male students of first grade high school students in District 3 of Tehran, in the academic year of 2010-2011. According to the size of the sample, based on the effect size and the test power, two 30-member classes as test groups and Controls were selected by random cluster sampling. The tools used in the research include the students' academic engagement questionnaire and the task value subscale in the Motivational Strategies for Learning Questionnaire. After obtaining the license to carry out the research from Tehran education department of Tehran and performing pre-test on the sample subjects, the training program of self-regulation strategies based on the Pintrich model was conducted for 8 weeks, that is, 8 sessions 90 minutes from the first half of October to the first half of December of the academic year of 2010-2011 on the subjects of the experimental group. During this period, there was no intervention in the control group. After the end of the intervention period, the level of educational engagement and task value were re-evaluated in both groups.

**Results:** The results of covariance analysis with the control of the pre-test variable showed that the scores of all the components of academic engagement (i.e. behavioral, cognitive and emotional engagement) and task value in the experimental group after training the self-regulation strategies significantly increased compared to the control group.

**Discussion and conclusion:** Self-regulation training curriculum can have a beneficial effect on students' academic achievement due to the focus on strengthening areas such as interest and motivation, concentration, scheduling and time management, taking notes and summarizing, knowing the attribution and source of control and problem solving.

**Key words:** Self-regulation, academic engagement, task value

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## Introduction

Lack of motivation and academic failure in students are two of the main concerns of most parents, and many students have not been able to achieve their expected progress despite intelligence and aptitude because academic achievement emphasizes controllable and educable factors such as meta-cognition and learning strategies (Ruffing, Wach, Spinath, Brünken & Karbach, 2015). Academic engagement and task value are two of the interconnected structures related to motivation and academic achievement in students.

The concept of academic engagement refers to the quality of the effort, which, students take on targeted educational activities to achieve desirable results directly (Linenbrink and Pintrich, 2002) and encompasses three dimensions of behavioral, cognitive and motivational engagement. Behavioral engagement refers to visible educational behaviors such as effort and persistence when facing problems while doing homework and asking for help from teachers or peers to learn and understand the lesson. Cognitive engagement refers to the types of processes that students use to learn (Ravindran, Green, and Debaker, 2000). In addition, motivational engagement involves internal interest in content and assignments, value and importance of them, existence of positive affection and absence of negative emotions such as frustration, anxiety and anger while doing homework and learning, and includes indicators of interest, value and affection.

The internal valuation of the tasks also refers to the importance that a learner attaches to a specific assignment or course, belief in the task and the purpose of study. Students who have internal valuation use deeper and meta-cognitive strategies (Ames & Archer, 1988). According to the expectation-value theory (Eccles and Wigfield, 2002), the value that students put on their tasks act as incentives for engagement in academic activities (Wigfield and Eccles, 2000). In addition, research has shown that task value effects academic achievement indirectly by influencing the learning strategies (Gan, 2005).

Factors affecting academic achievement and failure have always been a central issue in education, but despite extensive research and large budgets, there are still a large number of students who drop out or face academic failure (Malekzadeh, 2007). It is obvious that students without the necessary motivation will not benefit from education. Such issues can be observed both in educational environments and in the context of research (Spaulding, 1998). In fact, there is a relationship between the motivation of students and use of learning strategies (Berger & Karabenick, 2010). Considering that motivation is the most important learning condition (Kadivar, 2003), we should investigate effective strategies to increase motivation in students. One of these strategies can be self-regulation learning.

The theory of self-regulation learning is rooted in cognitive psychology and its origins lie in the theory of social-cognitive learning of Albert Bandura (Bandura, 1997). Self-regulation is a cyclic process because personal, behavioral

and environmental factors usually change during learning and are reviewed. These revisions lead to changes in strategies, cognition, emotions and behaviors (Pintrich, 2007). Self-regulation learning consists of three main components: cognition, meta-cognition, and motivation (Zimmerman, 2000).

Adaptation and success in school require that students develop and reinforce their emotions or behaviors through self-regulation development or similar processes (Schunk & Zimmerman, 1997). Research conducted over the past few years has shown that successful and self-regulated students have some characteristics such as intrinsic motivation, task value beliefs and self-sufficiency and use cognitive and meta-cognitive strategies. They are confident in their ability and use more resources to achieve their goals (Pintrich & Schunk, 2002; Perry, 2008; Kwan Ning & Downing, 2010; Berger & Karabenick, 2010; Foulad Chang and Latifian, 2001; Malekzadeh, 2007; Davoudi Filabadi, 2011).

One of the proposed models for self-regulation is the model proposed by Pintrich (1999). In this model, learners are actively involved in their learning process, and as a result, they can direct their thoughts, emotions and actions in a way that has a positive impact on their learning and motivation (Boekaerts & Corno, 2005). Pintrich and Schunk (2002) argue that self-regulation learning is an active and practicable process in which students determine goals for their learning and then attempt to monitor and regulate their motivation and behavior.

The Pintrich model of self-regulation learning includes three general categories: a) cognitive strategies b) meta-cognitive strategies and c) resource management strategies. Cognitive strategies are such as repeating and reviewing information, expanding and adding more details to new content. Text organizing can be considered as a set of processes or actions related to acquisition, maintenance, or use of information (Pintrich & De Groot, 2010) Meta-cognitive strategies such as planning, thought monitoring, academic performance, regulate the process of learning and study, help the person to monitor their progress while learning and knowing of tasks. It also helps them to assess the results of their efforts and evaluate their own proficiency over the content they read (Seif, 2004; Pintrich, 1999). Finally, learners, in addition to self-regulation of cognition and meta-cognition, must be able to resource management strategies, manage and regulate their time and environment, monitor efforts, learn from their peers and ask for help of peers and teachers (Pintrich And De Groot, 1990; Chen, 2002). Among self-regulation models, the self-regulation model proposed by Pintrich (1999) has good experimental support (Abedini and Kadkhodaie, 2012).

According to the mentioned issues in the present study, the researcher tries to study academic engagement and task value of the students by educating self-regulation strategies based on the Pintrich model while expressing engagement between motivational and cognitive factors, which affect learning and advancement together.

## Method

### Society, sample and sampling method

The present study is a quasi-experimental study with pretest-posttest design with control group. The statistical population of this research includes all male students of first grade high school students in district 3 of Tehran, in the academic year of 2010-2011. To determine the sample size (two groups) based on the effect size of 40 and the test power of 78, were selected, about 30 people. In order to select the experimental and control groups, we selected two schools and from each school a class of 30 students by random cluster sampling from the list of male students of first grade high schools in district 3 of Tehran.

### Tools

The tools used in this study are:

#### 1. Academic engagement questionnaire for students

This questionnaire was developed by Kang, Wang and Lam (2003) and includes 62 questions in the 5-point Likert scale (never = 5, always = 1). The internal consistency of subscales of emotional engagement scores is 0.77, cognitive engagement is 0.73, and behavioral engagement is 0.70 (Kang et al., 2003). It should be noted that in the present study, we discarded other subscales (superficial strategy, deep strategy, trust, interest, tendency to achieve results, anxiety, despair, accuracy, assiduity and spending time), due to the fact that three dimensions of educational engagement were considered

#### 2. Task value questionnaire

In order to measure task value, we used a task value subscale in motivational strategies questionnaire for learning (Pintrich, Smith, Garcia, and McCatchy, 1991). This subscale contains 6 items. The internal consistency coefficient of this questionnaire was 0.88 in research of Lavasani et al. (2011). In addition, Cronbach's alpha in task value questionnaire was 0.86.

### Research methodology

After obtaining a license from the Department of Education in Tehran and satisfaction of Razi and Sobhan Schools' principals and consultants to conduct the research, in the pre-test phase, questionnaires containing questions related to academic engagement and task value were provided to all students (experimental and Control groups). After distributing the questionnaires, students were asked to read the questions and select the appropriate option. Students were reminded that the answer to the questions would remain confidential and had no effect on their final score or any other score. Then a training program was conducted for the experimental group. This program was previously set up by Tavakoli (2008) and is based on the Pintrich self-regulation model. This training program lasted for 8 weeks, i.e., 8 sessions of 90 minutes, and the duration of training continued from the first half of October to the first half of December in the academic year of 2010-2011. It should be noted that at each session, they were given a task to use learning strategies and asked to submit the result to the next session in the classroom. At the end of these eight weeks, we re-evaluated the educational engagement and task value test in both groups. Motivational interviewing sessions are presented in Table 1:

## Findings

The mean and standard deviation of the components (behavioral, cognitive and emotional) of academic engagement and task value of students are presented in Table 2.

As it can be seen, the mean of all three components of academic engagement and task value in the post-test in the experimental group is more than the control group. The covariance analysis was used to determine the significance of the differences in the averages, which is shown in Table 4- page 246. The insignificance of Levine's test (Table 3) also indicates the homogeneity of the variances of the groups.

As it can be seen, there is a significant difference between the experimental group, who were subjected to self-regulation training and the control group who had no intervention, in terms of all components of academic engagement and task value in the post-test. In other words, self-regulation training has increased the academic engagement and task value of students.

## Discussion and Conclusion

The purpose of this study was to investigate the effect of self-regulation training strategies based on Pintrich's model on academic engagement and task value of high school students. The findings indicated a significant effect of self-regulation training strategies on strengthening academic engagement and task value of students. The findings of this study can be verified in two general directions:

The results of the first direction include the effectiveness of self-regulation strategies on improving the academic engagement of high school male students in all courses. These results are in line with the studies conducted in this area (Malekzadeh, 2007; Askan, 2009; - Heikila et al., 2006). Given that self-regulating strategies predict future motivation for students, successful application of these strategies leads to an increase in student's self-efficacy beliefs, thus increasing students' academic engagement in learning lessons. Heikila et al. (2006) reported that self-regulatory strategies could increase cognitive and motivational engagement and problem solving, and lead to success and achievement in learning goals. In his study, Askan (2009) found that improving self-regulatory skills caused student motivational engagement. The skills help learners make a good choice and give more value to tasks. Therefore, learners need to know how to learn, and how learning is accomplished. It should be noted that student's involvement in the lessons was low, but the covariance analysis showed that self-regulation strategies improved students' academic engagement in the courses.

The results of the second direction indicate the effectiveness of self-regulating strategies on increasing the task value of the students, meaning that, this training has been able to increase task value of student in all courses. Students with more task value are more motivated to learn lessons and use more and deeper learning strategies. Green's et al

**Table 1: Structure of Pintrich's Self-Regulation educational Sessions (1999)**

Sessions	Content and techniques	
First	Establish communication	Introduction, Establishing a friendly relationship, Students' motivation to learn lessons, Explanation of the goals and benefits of the curriculum
Second	Motivation and interest	Discussion on motivation and interest, discussion on the motivation impact on studying lessons, introducing methods for increasing motivation (identifying available goals, establishing self-reinforcement system, determining the types of thoughts and their effects, concluding a contract), homework
Third	Concentration	Discussion on focusing, affecting factors on concentration (study place, interest, beliefs and attitudes), homework tasks
Fourth	Timing	Talk about scheduling and adjusting time and its benefits, using a timetable, setting priorities, using modeling in education, homework
Fifth	Summarizing and note taking	Talking about taking notes and summarizing, learning how to use notes and summarize, homework
Sixth and seventh	Source control strategy	Discussion on the theory of documents and internal and external control source, homework
Eighth	Problem solving	Teaching problem solving strategy, homework

**Table 2: Descriptive Results of academic engagement and task value of students**

Variable	Group	Pre-test		Post-test	
		M	SD	M	SD
Behavioral engagement	Control	3.45	0.87	3.33	0.86
	Experiment	3.47	0.83	3.74	0.60
Cognitive engagement	Control	3.14	0.32	3.13	0.52
	Experiment	3.16	0.46	3.38	0.35
Emotional engagement	Control	3.13	0.58	3.10	0.60
	Experiment	3.11	0.29	3.37	0.31
Task value	Control	3.88	0.62	3.63	0.91
	Experiment	3.85	0.68	4.20	0.71

**Table 3: Levine test for homogeneity of variances**

	F	Df1	Df2	Sig.
Behavioral engagement	0.00	1	58	0.95
Cognitive engagement	0.07	1	58	780.
Emotional engagement	0.00	1	58	0.65
Task value	1.78	1	58	0.18

**Table 4: The results of covariance analysis in single-variable of scores and academic engagement and task value components in students**

Variable	Source of change	Sum of squares	Df	Averages of squares	F	Sig.	Test ability
Behavioral engagement	Pre test	13.83	1	13.83	42.74	0.00	1.00
	group	2.50	1	2.50	7.74	0.00	0.78
	Error	18.44	57	0.32			
Cognitive engagement	Pre test	0.00	1	0.00	0.02	0.89	0.05
	group	0.90	1	0.90	4.47	0.04	0.55
	Error	11.49	57	0.20			
Emotional engagement	Pre test	2.39	1	2.39	12.44	0.00	0.93
	group	1.21	1	1.21	6.30	0.01	0.70
	Error	10.96	57	0.19			
Task value	Pre test	2.645	1	2.645	4.176	0.05	0.52
	group	5.067	1	5.067	8.004	0.00	0.79
	Error	36.081	57	0.633			

study (2004) showed that task value of individuals, which they called "perceived usefulness," anticipates elegance choices. In addition, task value has meaningful participation in academic achievement (Hejazi and Abedini, 2008), affects academic achievement indirectly through influencing the learning strategies (Gan, 2005), and stated as an incentive for engagement in academic activities (Wigfield et al., 2006). In general, task value can be measured in different subjects and domains (for example, mathematics, chemistry, etc.) (Eccles, 2005). However, most studies (such as this study) have conducted on relationship between task value and academic performance in general (without distinction of different courses). Overall, it can be argued that training in self-regulation strategies is a way to increase task value in them due to the focus on improving students' interest and motivation and discussions with them in this field.

Limitations of the study included: 1) Information resources are limited to self-assessment tools and did not use parent or teacher information resources for the status of studied variables due to time constraints and lack of cooperation from schools. 2) Since the academic background is controlled in this study, generalization of the results to other grades and classes are limited. 3) Research has been carried out in boys' schools, so it is difficult to generalize the results to both genders and finally, (4) due to time constraints, long-term follow-up (more than two months) was not accomplished to pursuing the sustainability of the effect of education.

Finally, since these strategies are considered as general skills, they are necessary for learning all the courses. Considering the importance of teaching these skills, especially in high school, it is suggested that teachers in their in-service training should familiarize themselves with self-regulation learning strategies and provide a basis for teaching such skills in schools because learners do not use self-regulation strategies on their own unless they are taught and required to use them.

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# An Assessment of the Relationship between Social Support and Mental Health of Students of Zabol University of Medical Science in 2017

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## Abstract

**Introduction & Objective:** Students in each society are considered the most important forces influencing the development of the country. The prevalence of any mental disorders among them can lead to waste of material and spiritual investments. Therefore, the present study was conducted to identify the importance of social factors' role in mental health as well as the relationship between perceived social support and resilience with mental health of students.

**Materials and Methods:** The statistical population included 1,900 undergraduate bachelor students at Zabol University of Medical Science during the academic year of 1997-98. In this research, 500 students were selected by stratified sampling from the whole society and evaluated using the 12 general health questionnaire (GHQ-12) and the multidimensional perceived social support scale (MSPSS). For data analysis, in addition to descriptive statistics, inferential statistics methods were used including: the Pearson correlation coefficient, t-tests and analysis of variance (ANOVA) by SPSS software and linear regression analysis using Stata software.

**Results:** The findings of this study showed that there was a significant correlation between social support and mental health ( $P < 0.0001$ ). Among the social support sub-scales, social protection of the family, social support of the most important individuals in their lives and social support of the friends were mostly related to mental health, respectively ( $P < 0.0001$ ).

**Conclusion:** The findings of the study showed that mental health of students improved with increasing their perceptions of social support, and their mental health was compromised by decreasing the sources of support.

**Key words:** Mental Health, Social Support, Students

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## Introduction

The WHO experts have defined mental health as being able to have harmonious communication with others, changing and modifying the individual and social environment, and resolving conflicts and personal preferences logically, fairly and appropriately, and they believe that mental health is not lack of psychological diseases, but the ability to respond to different types of experiences of life flexibly and meaningfully (1).

Universities are organizations that attract a significant number of young people annually and, over a specified time, foster the scientific and practical capabilities of these individuals, and ultimately provide more educated and specialized staff to the wider community. The Academic period, due to the existence of multiple factors, is a stressful period and a common model which has been introduced to describe the onset of mental illness is the vulnerability-stress model (2).

In recent years, the progressive increase in the number of students referred to counseling centers, the increased prevalence and severity of their mental health problems have increased the concern of experts about mental health of students (3). Many studies in Iran also suggest that there are many psychological problems among students. Multiple reports from 1963-2001 show that the range of mental disorders between students varied from 11.7% to 54 % (4). The study of mental health of student groups in the country conducted by the Youth National Organization (5) shows that 53.4% or more than half of the students are among those who need counseling to be able to resolve their own problems and enter society as a powerful and strong young person.

In several studies, researchers from different psychosocial variables reported a strong relationship between social support and mental health (6). "Social Protection" has been defined as the level of enjoyment of love, companionship, care, respect, attention, and received assistance by the individual from other individuals or groups such as family members, friends and important people (7). Various studies have shown that social support is associated with social isolation, stressors, psychiatric disorders, depression symptoms, intimate marital relationships, rate of suicide attempts, and the rate of social interaction (8).

Social support affects mental health and the human body directly and indirectly. Social support is defined as one's confidence in their abilities to overcome stress, and improve stress coping ability, self-esteem, emotional stability, and individual characteristics that increase social support on the part of others (9). Research shows that people with high social support who do not have self-defeating behaviors, are emotionally calm and able to cope with adverse and unpleasant conditions (10). In the context of the outcomes of social support, we can point out to increased level of mental health and life satisfaction in the research of Lazarus (11) and Basu (12) and on mental health or reduction of emotional problems and life

satisfaction in the research of Basu (12) and Samani et al. (13).

The mental health of people in a community, especially its effective and constructive class, is a necessity for the dynamics, maturity and promotion of that community. The unique and imperative role of students as future managers and future-makers of each society necessitates supporting their mental health as well as identifying and eliminating negative factors affecting their mental health. Considering the increasing prevalence of psychological problems in students, the imperative role of social support in preventing these problems, and also due to inadequate research and cultural conditions in Zabol city, this study was conducted to determine the relationship between social support and mental health of students.

## Materials and Methods

Research method is correlation, which is one of the descriptive research methods. The statistical population consisted of 1,900 students who studied in nursing, midwifery, medicine, pharmacy, paramedical and public health schools of Zabol University of Medical Science in 2016-17. In this research, 500 students were considered as a random sample of the entire community. Individuals were selected through stratified sampling and being selected from the colleges, academic years and both sexes.

After selecting the students, the relevant questionnaires were randomly distributed in the classrooms between the students and were collected by appropriate specified time immediately after completion by the researcher and colleagues. Four questionnaires were used in this study. The general profile of the respondents was set by the researcher and the individual and demographic characteristics of the respondents were questioned. The General Health Questionnaire with 12 questions (GHQ-12) was prepared with the aim of screening healthy people for mental disorders. This questionnaire is validated and used in many countries around the world.

In Iran, the short form of 12 questions was validated by the Research Institute of Health Science of Jihad University of Iran under the direction of Dr. Ali Montazeri and his colleagues with Cronbach's alpha,  $r = 0.87$ . The validity of the questionnaire was also obtained through convergent validity with the quality of life scale ( $P < 0.0001$ ,  $F = 58.6$ ). (34). Questions are scored in terms of two digits scoring (0-0-1-1), resulting in a range of 0 to 12 variables. Further scores indicate less mental health. According to the cut-off point of the questionnaire, scores greater than 3.5 were identified as suspect to mental disorders and scores below 3.5 as healthy subjects (34).

Multidimensional perceived social support (MSPSS) was used to evaluate social support. This questionnaire as a 12-phrasal is developed by Zimet to assess perceived social support from three sources: family, friends and imperative people in life. The multidimensional perceived social support scale measures the extent of perceived social support in each of the three mentioned areas. The

scale of multidimensional perceived social support has a favorable internal consistency. The alpha coefficient of the whole test is 0.91 and the alpha coefficient of its sub-scales is in the range from 0.9 to 0.95 (35). Salimi et al. have achieved the validity and reliability of this scale in Iran, so that the reliability coefficient of Cronbach's alpha for each dimension was 0.86, 0.86 and 0.82, respectively, and its validity was appropriate by causal analysis method (36).

In this study, the following mentioned options have specific points: totally disagree; 1 point; disagree; 2 points; almost disagree; 3 points; I have no comment; 4 points; almost agree; 5 points; agree; 6 points; totally agree; 7 points. To obtain the average score of the total test, all the scores are summed and divided by their number. To obtain a score for each sub-scale, the score of the terms associated with the sub-scale are summed up and divided by the number of its terms. A high score on this scale reflects a high level of perceived social support. According to the midpoint of the questionnaire, scores above 3.5 were assigned as high social support and scores below 3.5 as low social protection (35).

In this research, in order to analyze the data and test the hypotheses in accordance with the levels of measurement of variables, in addition to descriptive statistics, inferential statistics methods were used by Stata 12 software, including: the Pearson correlation coefficient, t-tests and analysis of variance (ANOVA) by SPSS software version 18 and linear regression analysis.

### Findings

The results showed that the mean age of students was  $20.7 \pm 1.55$  years and most students (52.6%) were in the age group of 21-23 years. Furthermore, according to the findings, most students were female (76%), single (86.2%), unemployed (97.2%), native (60.2%) and dormitory-resident (70.2%).

The findings showed that there was a significant negative relationship between social support and mental health ( $r = -0.33, p < 0.0001$ ). This means that by increasing the social support score, the mental health score will decrease. In other words, students with higher social support had higher mental health. Moreover, among the sub-scales of social support, the social protection of the family mostly related to mental health ( $r = -0.32, p < 0.0001$ ). This means that students who had more family support had higher mental health (Table 1).

### Discussion

The findings of this study showed that mental health of students will improve their perception and imagination of the received social support rate by family, friends and important people in their life and by reducing the supportive resources, their mental health is compromised. This finding, according to the results of conducted research in this field, including Azad (37), Bakhshani et al. (38), Bakhshi Pour et al. (39), O'Connora et al. (40) and Landman et al. (41), suggests that perceived or received social support can improve mental health.

Additionally, the findings of this study showed that among social support types, family social support was more important than the support of friends and other people. Indeed, this study showed that those who felt they had high social support had greater mental health than other people. This result is consistent with the studies conducted by Tabrizi and Razi (42) and Chi and Chou (43).

The relationship between social support, health and its beneficial effect on mental and physical health in recent years has attracted the attention of researchers. Social support is one of the strongest predictors of mental health, so that the better and wider social network of the individual will lead to a greater level of mental health. In fact, social support acts as a backbone or a mediator between the stresses of life and the disturbance of well-being (44). Sarafino maintains that social support from friends, family, and others leads to reduction in mental health problems in people, thereby affecting the mental health of individuals (7). Lo also believes that social support modifies the effects of stressful events and leads to experiencing positive emotions (45). Stroebe et al. reported that the higher receiving of social support from others led to greater mental health (46). Social support also acts as a barrier against stress. This support can be especially important for those experiencing stress in life (47).

According to the results of this research and other research, it can be stated that informal support and the perception and efficiency of family and friends as sources of support can play an essential role in controlling and reducing stress. Thus, protecting the umbrella of the family, friends and important individuals in a students' life, as well as having strong social relationships and interactions, can help a person to better face and adapt to life problems. Obviously, it is important to note that in the meantime,

**Table 1: Evaluation of the correlation between social support and its sub-scales with mental health**

Variable	The Pearson correlation coefficient	Significance
Mental health etc.		
Total social support	-0.33	<0.0001
Social support of family	-0.32	<0.0001
Social support of friends	-0.2	<0.0001
Social support of imperative persons	-0.26	<0.0001

receiving social support from the family has a significant effect on reducing stress, better adaptation, and more desirable performance.

The possible explanation in this regard is that social support may reduce the adverse effects of pressures (stressors) in two ways. First, social support reduces psychological pressure by attempting to vaccinate a person against experiencing pressures. If someone has a rich social network for advice, resources and facilities and financial assistance, potential pressures will not be a cause for concern and anxiety. Secondly, social support networks act as a barrier to psychological pressure. Knowledge and confidence of a person can be under the social network support when he / she experiences stress that allows him/her to evaluate the events of life as less threatening. Ultimately, social support can increase the resistance of individuals to the negative effects of stressors, and therefore, the individual's mental health is more likely to be protected and improved.

## Conclusion

The most important result of the present study was to confirm the relationship between the level of social support perceived by the students and their mental health, being consistent with the presented research background on social protection and its relationship with mental health. More clearly, as expected, the findings of the research showed that mental health of students increased their perception of social support, and their mental health was compromised by reducing their supporting resources.

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# Cross cultural differences in students with regard to study habit – counseling as an intervention

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## Abstract

The present study focuses in the Intervention Program aimed at improving the study habits of students. Academic performance is highly influenced by study habits. Study habits ensure the student actively works on their subject matter to retain what they were taught in class. We have 70 Iranian students, and 100 Indian students who live in a suburb and are not proficient in English. They are in different majors at Hyderabad University, India. This study was held to investigate the study habits of the students, and the way they learn to show their improvement in English language learning, their lessons and their self-awareness. Also self-counseling and group counseling had a positive impact on the student regarding how to adapt themselves with a new environment and new people. Self-counseling shows that students can improve their self-confidence, self-awareness and adapting to new situations.

**Key words:** Cross culture, Study habit, Counseling, Intervention

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## Introduction

According to Nuthana (2009) study habits refer to the activity carried out by learners during the learning process of improving knowledge. Study habits are intended to elicit and guide one's cognitive processes during learning. Good study habits are good assets for learners because habits assist students to attain mastery in areas of specialization and excellent performance, while opposite constitutive constraints to learning and achievement can cause failure.

As Patel (1976) mentioned study habits also include environment and planning of work, reading and note taking habits, planning of subjects, habits of concentration, preparation for examination, general habits and attitudes, and school environment.

Learning style is described by Cassidy (2004) as "the individual's intellectual approaches to the processing of information". Honey and Mumford (1992) describe learning style as an individual preferred or habitual way of processing and transforming knowledge. Each learner has his/her own preferred way of perception; organizing and retraining that are distinctive (Chou & Wong, 2000, Griggs, 1999, Leutner & Plass 1998). Cross-cultural studies are applied widely in the social sciences, particularly in cultural anthropology and psychology. Cross cultural studies focus on the common and diverse traits or characteristics of the groups being observed.

In this study we observed some similarities in cross culture like facing difficulty in English language, new environments and experiencing home sickness and the purpose of being educated. The differences are education system, native language and cultural differences.

Intervention can be defined as a strategic solution to a problem which is truly analyzed and focused at the cause of the problem and solutions. It can be problem solving intervention and therapeutic intervention. There is a need for intervention on study habits as the very low understanding level and equally poor and deteriorating knowledge of many students is a great concern of educators, parents and government, and signals that students need help developing study skills include spending too much time

studying, taking class notes that are difficult to understand or contain the wrong information, procrastinating about large projects or tasks, being unable to identify what is important in a text, or being unable to remember what they have read.

## Background

Mace (2002) pointed out that study is systematic acquisition of knowledge and an understanding of facts and principles that calls for retention and application. Kelly (1998) stated that study is the application of one's mental capacity to the acquisition, understanding and recognition of knowledge; it often involves some form of formal learning. Study skills refer to the student's knowledge of appropriate study strategies and methods and the ability to manage time and other resources to meet the demands of the academic tasks. Study habits typically denote the degree to which the student engages in regular acts of studying that are characterized by appropriate studying routines occurring in an environment that is conducive to study.

A study conducted by Marshall (1985) measured client preferences and satisfaction following the use of counseling approaches that were compatible with their learning style preferences.

Walker (2005) found that when schools implement programs that build resilience in this way, they are able to focus on the development of the whole child. Research supports the effectiveness of a range of school-based strategies for building resiliency; the most effective are those that leverage on the strengths students already possess, as well as identifying areas where improvements may be needed.

Thomas and Robinson (1990) emphasized that the learner needs to use a systematic discipline and purposive approach to study. Effective study consists of a conscious sequential series of inter-related steps and processes; the impact of educational interventions made in the first – and second – year course. It also addresses methodology, specification, and statistical analysis with respect to other studies in the field.

## The Study

This study emerged out of experience and observation as a foreign student of Osmania University. Without a proper base in English language and also being in a new environment makes students who are from Iran and rural background, wade through various troubles. Foreign students have difficulty in adjusting to new situations, new culture, new people, and different education systems and for Iranian students English language is the most important concern.

### Participants

The participants were the students of post-graduation (1st year) of Iran and Indian students from a rural area, who studied in various courses in Hyderabad, India.

The participants used to pilot this study were 10 Indian students and 20 Iranian students from various courses in Osmania University. The participants were 100 Indian students and 70 Iranian students in different courses in different universities in Hyderabad

### Instrumentation

- a) Test of Proficiency in English
- b) Personality test (MBTI) & learning style
- c) Study habit inventory

### Materials

The materials used in this study were proficiency test and personality test which conclude the intervention to guide students. Beside pretest and posttest they had an internal test which was held by the university. Intervention was used to help them to improve their habits and way of studying. All students had intervention twice during this study and some of them had it personally besides midterm exam and final exam.

### Procedure

This study was conducted in two parts. Part one was a pilot study and part two was the main study. A few colleges were selected randomly for the study and then participants were informed about the study. First of all subjects were chosen from different faculties and a test was conducted, such as Study Habits, proficiency of English, MBTI. The samples were identified and the purpose of the research was explained. Intervention strategies were designed keeping in mind, the scores of the study habits inventory and scores of students in the English proficiency test that had been conducted.

As each individual took the test in the following order, Study habits, Proficiency of English, learning Style and MBTI, the researcher established rapport and the Study habits procedure was administered. The Study Habits taken for each student were analyzed. The first English Proficiency Test was administered and the results were analyzed. These two tests were the basis for starting the intervention. When the researcher found both groups had unsatisfactory study habits, Intervention strategies designed to transform their poor study habits into good study habits were undertaken. The researcher conducted group counseling sessions for the group of 10 students at each session. Every session included the explanation of good study habits technique based on study habits inventory aspect. At the end of the counseling session each student received prepared individualized instructions on altering their unsatisfactory Study Habits.

Proficiency of English test 1 was conducted to assess the student's skills. The total score was 50, and it was categorized into the three following categories: below average (0-20), average (21-30), above average (31-50), Proficiency of English test 2 was conducted after three months as a post test.

Group and individual counseling was conducted as per the requirement of students; multiple sessions were conducted to assist the students in achieve better proficiency in

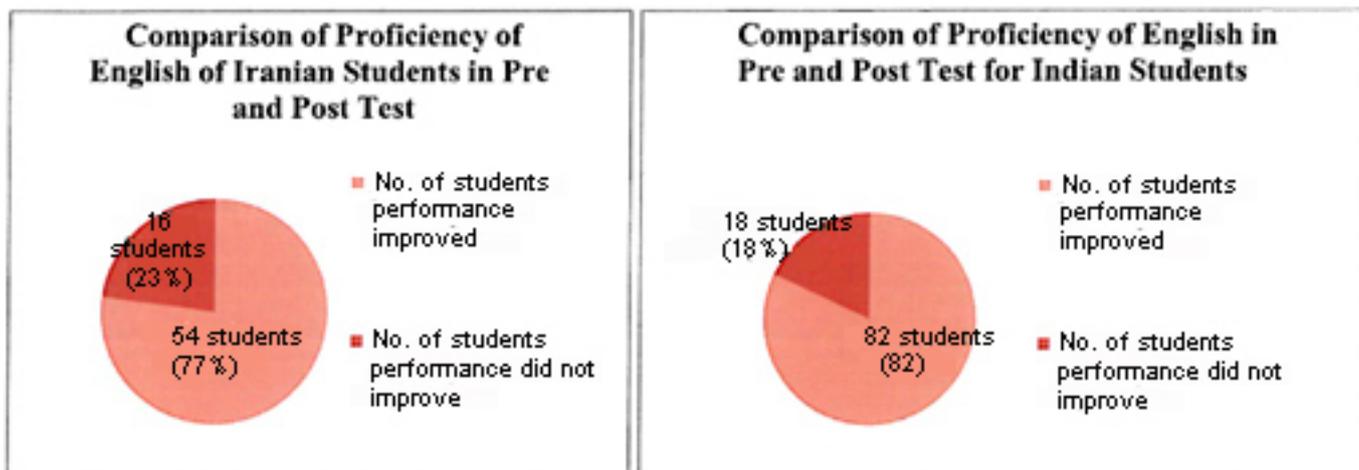
English; each session included framing an action plan as per the individual needs of the students. The researcher was in contact with the students not only through the counseling sessions but also through phone and email.

To design the intervention strategies for better academic performance of students individual MBTI personality tests were administered. Understanding the personality traits of a person helps in planning an intervention which helps in understanding the best way of learning for each individual.

## Data Analysis and Result

### Pre Test and PostTest

**Graph 1 and 2: Showing Comparison of Performance on Proficiency of English in Pre-Post Tests of Iranian and Indian Students**

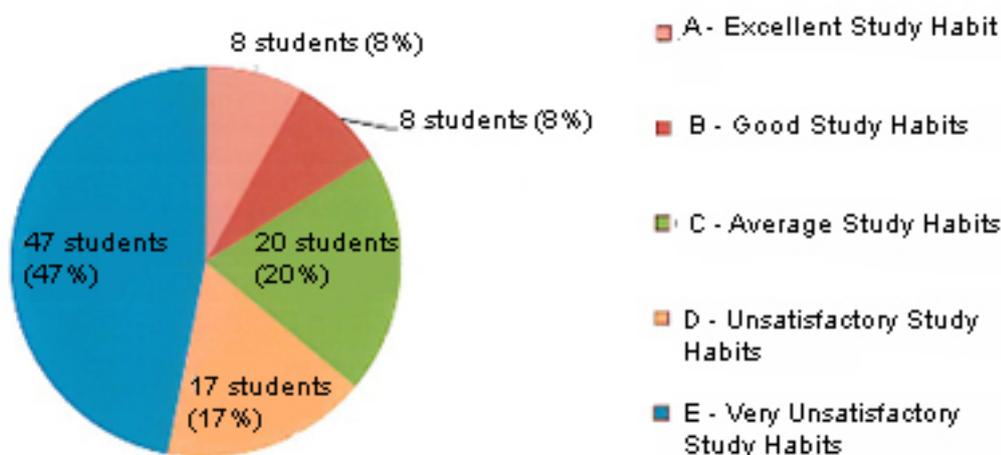


To show the effort was fruitful, we measured the Proficiency of English because, proficiency of English test was a critical point of study habits. This was measured for each subject. Regarding the comparison of performance on Proficiency of English in pre and posttest, one can say that 77% of Iranian students improved in the posttest, with the help on Intervention in all skills, whereas 82% of Indian students improved in the posttest. We can interpret that the intervention was effective on both categories of students, but Indian students improved more than Iranian students.

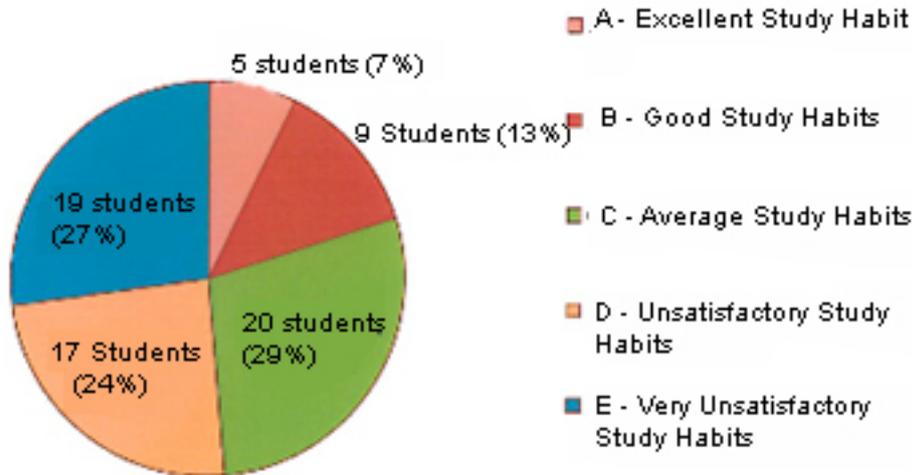
### Study Habits

Graphs 3 and 4 show level of Study Habits of Indian and Iranian Students

**Graph 3: Study Habits of Indian students**

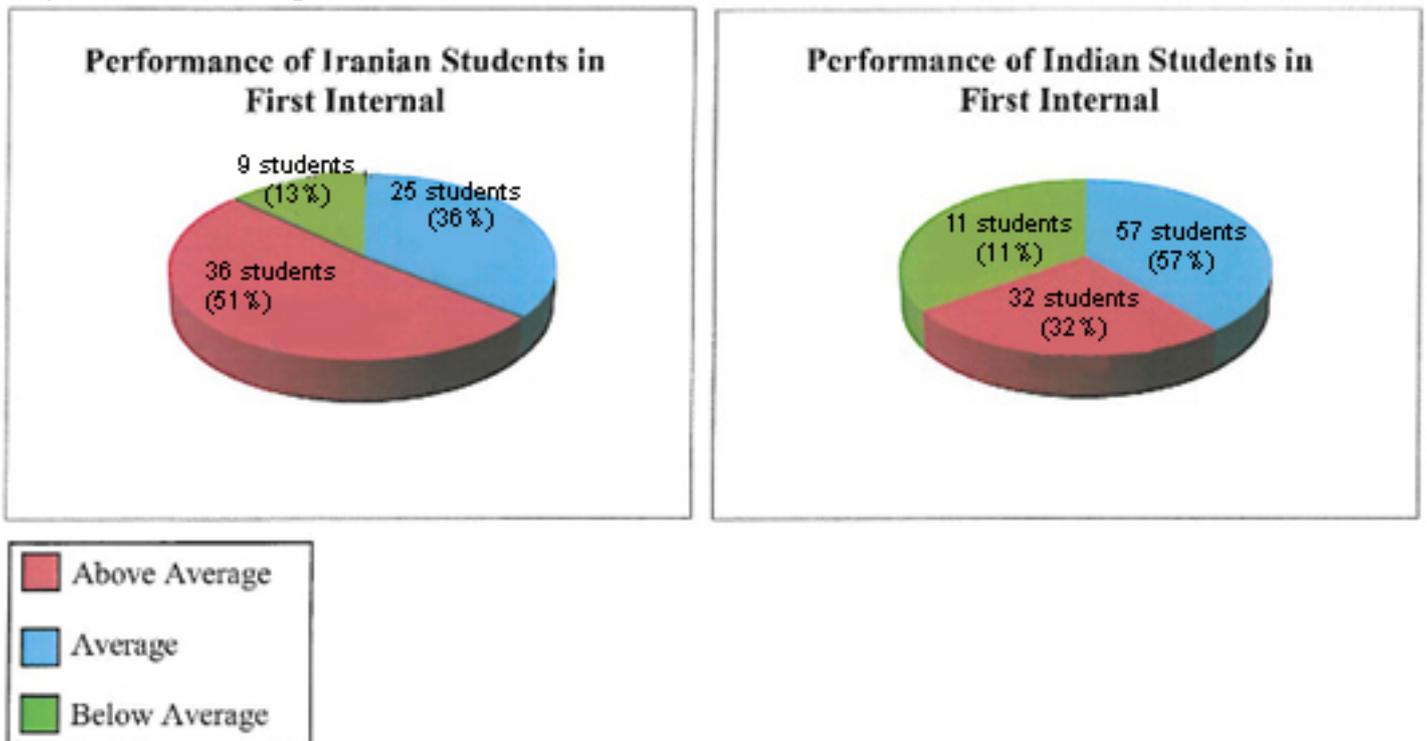


**Study habits of Iranian students**



The above graphs show the level of Study Habits of students in the Indian and Iranian Categories. The study habits were classified into different ranges from excellent to very unsatisfactory. The students' level of study habits are shown in the graph; there are very few students from both categories who were shown to have excellent study habits, that is 7% of Iranian students and 8% of Indian students, whereas 13% and 8% of Iranian and Indian Students respectively had good study habits, and 29% of Iranian students and 20% of Indian students had average study habits. However more than 50% of students belong to unsatisfactory study habit a part of graph. In the interview with the students, when they were given their study habits results, on enquiry, regarding their unsatisfactory study habits, the majority of students claim that the reason for their poor study habits it because of their low language proficiency.

**Graph 5 and 6: Showing Performance of Internal Exam of Iranian and Indian Students**

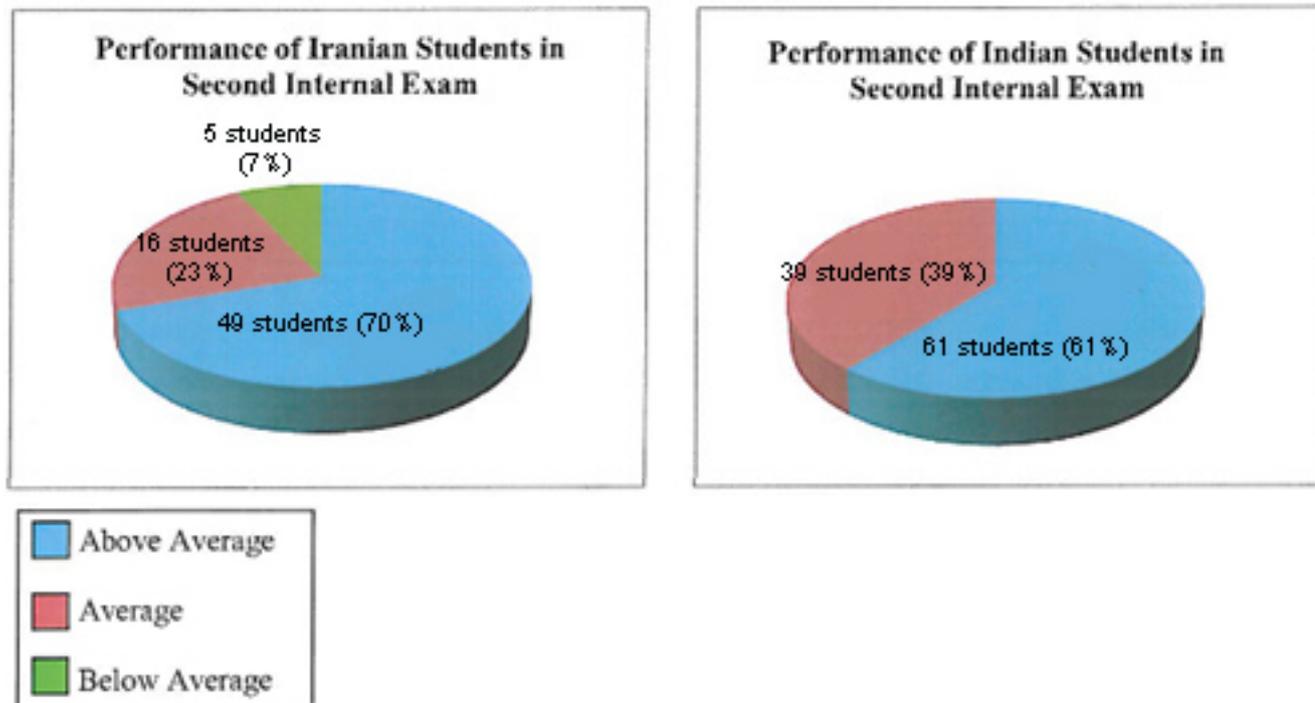


From the above graph it can be interpreted that, 36% of Iranian Students and 57% of Indian Students are in the Above Average Level of First Internal Exam, 51% of Iranians and 32% of Indian Students are showing Average Level and 13% of Iranian and 11% of Indian Students are at Below Average Level in the First Internal Exam.

Intervention was administered case-wise; the investigator administered tests like Personality and learning Style only to categorize them into groups. The Personality test was helpful in bringing awareness about their sensitivity to receiving Instruction and suggestions related to study habits. Intervention was carried out using means such as telephone, email, and face to face counseling, for each subject the multiple session intervention was given, between 3 to 4 sessions, with each session ranging from 40 minutes to one hour, Intervention spread across four months. After sitting the second internal

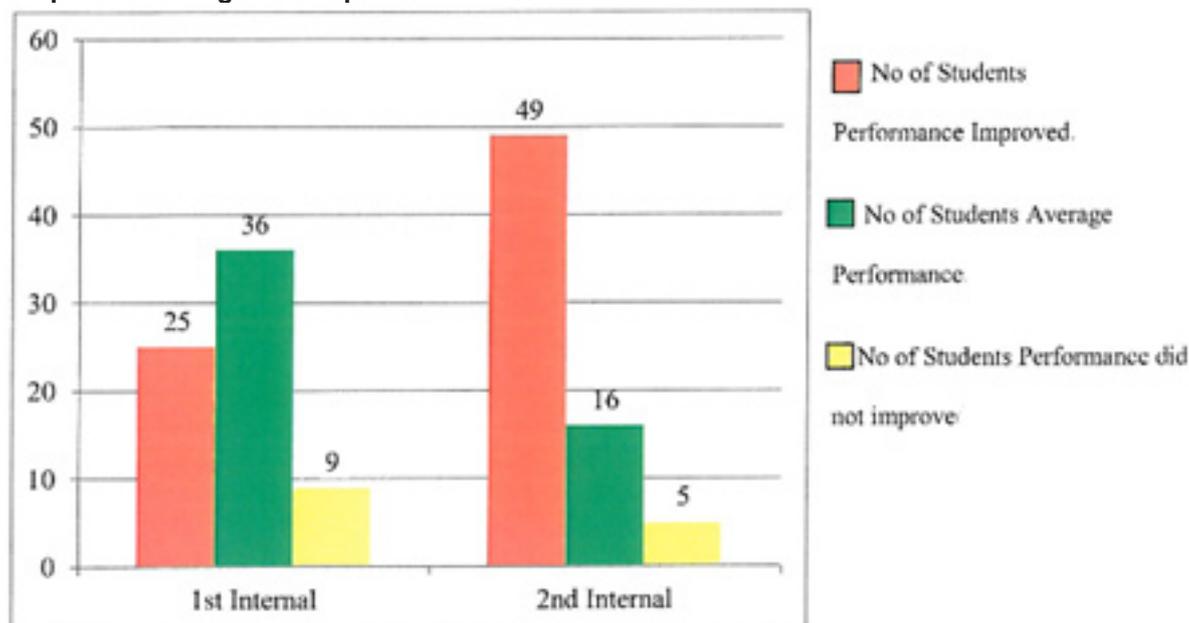
exam, the investigator met the subjects, counseled them regarding their performance, and suggested to them how they could prepare themselves to improve all study skills, how help them to make a contract with themselves, and set a study target, so that they can perform better in the final exam.

**Graph 7 and 8: Showing Performance of Second Internal assessment Exam of Iranian and Indian Students**



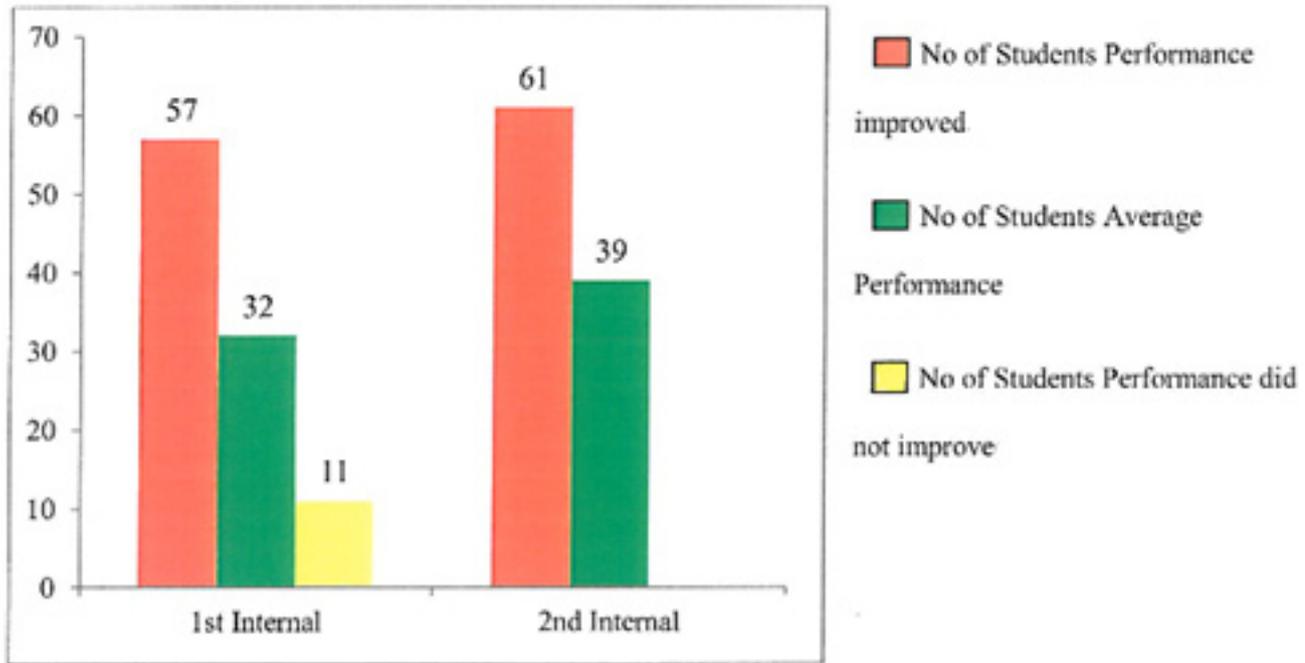
By this graph 70% of Iranian Students and 61% of Indian Students were at the Above Average Level at the Second Internal Exam, 23% of Iranians and 39% of Indian Students were at the Average Level and 7% of Iranians were Below Average Level of Second Internal Exam. Whereas there were no Indian Students whose performance was at Below Average level.

**Graph 9: Showing the comparison between First and Second Internal Assessment of Iranian Students**



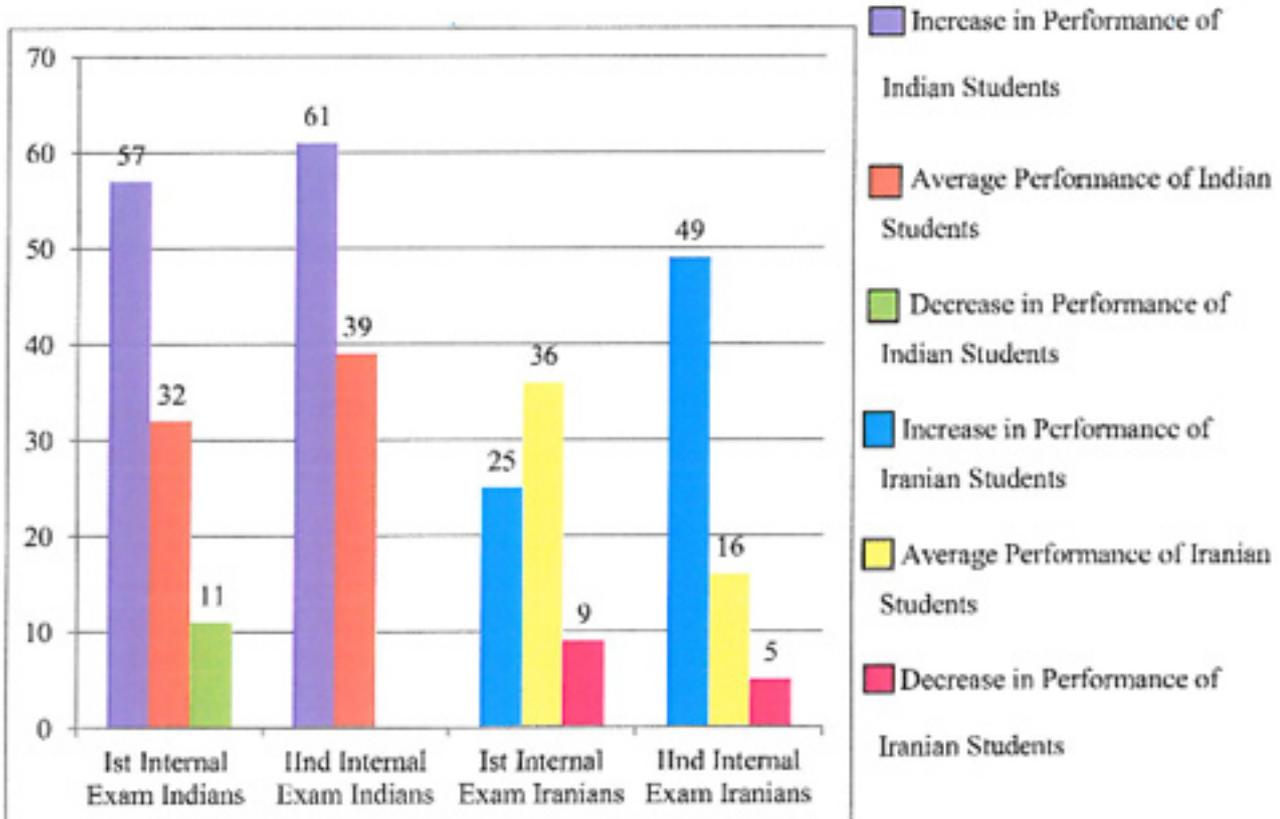
The above graph shows in the first internal exam 25% students were at above average level, where as in the second internal exam with the help of Intervention the performance had increased to 49%. Also in the first internal exam 9% students were at Below Average Level, whereas in the second internal exam with the help of Intervention the number reduced to 5%, and 39% students were at Average level in the first internal exam. In the second internal exam the students' performance went to above average level decreasing the average level performance. This shows that the students' performance improved in the second internal exam with the help of intervention.

**Graph 10: Showing the comparison between First and Second Internal Assessment of Indian Students**



From the above graph it can be interpreted that, in the first internal exam 57% students were at above average level, whereas in the second internal exam with the help of Intervention the performance increased to 61%. Also in first internal exam 32% students were at Average Level, whereas in the second internal exam the average level of performance increased little to 36%, and 11% of students are at Below Average level in the first internal exam, and in the second internal exam there were no students at Below Average level. This shows that the students' performance improved in the second internal exam with the help of intervention.

**Graph 11: Showing the Comparison of I and II Internal Assessment between Indian and Iranian Students**



The above graph shows Indian students have improved on their performance in the Internal Assessment more than the Iranian Students. Already as it has been mentioned independently in Graphs 4 and 5 the number of increased and decreased level of performance of the both category students.

## Conclusion

There was an improvement between First and Second Internal marks of both groups of students Indian students attained a score of 54 in the first internal assessment and a score of 58 in the second internal assessment. The Iranian students attained a score of 50 in the first internal assessment and a score of 54 in the second internal assessment.

Proficiency of English Post-Test was conducted, after a gap of 3 months of Proficiency of English Pre-Test. There is a significant improvement in terms of Proficiency of English in the scores of pre proficiency and post proficiency. In the pretest both the groups attained a score of 20 which is below average. They improved in the posttest, with a score of 25 for Indian students and a score of 24 for Iranian students.

There was an improvement in the First and Second Final Semester due to the impact of Intervention. Indian students attained a score of 79 in the first final semester and a score of 82 in the second final semester. Iranian students attained a score of 49 in first final semester and a score of 66 in the second final semester.

Iranian student's performance in the final examination was slightly better than Indian students; this can be attributed to their effort, goal oriented preparation and better adjustment level as the time passed. Intervention had a positive impact on their overall Academic Performance, as seen from the total marks of internal examination and final examination.

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# The Effect of Principles of Islamic Management on Improving the Work Process of the Organization (Case Study of Yasuj University of Medical Sciences)

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## Abstract

The purpose of this study was to investigate the effect of management of Islamic principles on improving the work process in Yasuj University of Medical Sciences. This research is based on a descriptive-correlation method of research with applied nature and in terms of time-span. The statistical population of this study was 274 staff members of Yasuj University of Medical Sciences. 156 items were selected through Morgan table. Non-random sampling method (available) was used. Data gathering tool in this research, was the standard questionnaire of the work process derived from (1) and the standard questionnaire of principles of Islamic management derived from (2), whose Cronbach's alpha were respectively 78/89 and 89. Descriptive and inferential analyzes (t-test and regression) were used to analyze the data using SPSS software. The results of the research showed that the principles of Islamic management (planning, organizing, motivating, leading, supervising and controlling managers and decision makers) affect the improvement of the work process in the University of Medical Sciences.

**Key words:** Islamic Management Principles, Planning, Organizing, Motivation, Leadership, Supervision and Control, Managing Decisions, Improving the Work Process.

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## Introduction

In today's turbulent and changing environment, the competitive advantage of other organizations is not just financial, but the key to success and competitive advantage of organizations over their competitors is how to use knowledge, staff skill, leadership and management. One area of knowledge of the present age, which all governments are concerned with, is the science of management, which is a vast field and like all other sciences, can be taught. Islamic management "is to use the right people and institutions in order to achieve organizational goals in a way that does not contradict religious law." The Islamic State of Islamic governance observes the holy rules of law are one of the most important issues and should be pursued with great perseverance (3).

Today, organizations and firms have to undergo major changes to survive and to compete in global domains due to the revision and redesign of business processes, taking into account all aspects and resources, including tangible and intangible assets, which are a huge part of the process of change. The business emerges through the management of its work processes and its environment (4). Improving the process means how we can do our work better than before, rather than simply worrying about quenching the problems that are occurring in different parts of the organization (5). In today's tense era of global competition and rapid technological advancement, politicians and managers consider job improvement as one of the organizational goals. This study pays attention to the impact of Islamic management principles on improving the work process in the medical university Yasuj.

## Statement of problem

When talking about management in Islam, it is primarily intended to administer the affairs and exploit the divine blessings based on the belief in the monotheistic worldview. That is, all acts and behaviors of humans or leaders should be based on the monotheistic worldview and the monotheistic philosophy requires that the actions of a director, in addition to conforming to the monotheistic worldview, be adapted to the principles and objectives of the Islamic society. Islamic management is a management mode that all individuals consider as responsible and influenced by the values of the Islamic value system. The distinction between Islamic management and other systems in the value system derives from the divine worldview. This worldview sees the whole universe as a coherent set of goals that are dominated by traditions. Therefore, in determining the goals and policies of the organization, it must give originality to spiritual values. In this sense, the Islamic city of the organization requires that its activities, spiritual goals and norms related to it be observed, and not only that the provision of material benefits does not lead to the trampling of human resources, but even attempts to ensure that the material benefits human beings and an introduction to the development and deepening of divine insights and the promotion of Islamic rituals (3).

Since the mid-twentieth century, many scholars and economists have been trying to attract the attention of organizations to adopt this new approach (business process) in the field of business. This approach is based on the fact that in each organization there are privileges and unique capabilities and resources from other organizations based on these resources that are based on integration and congestion, when in fact these resources cannot easily be increased or differentiated. In simple terms, it may be possible to set the organization's intangible assets from intangible and hidden resources, and knowledge and information to processes resulting from these resources. On the other hand, organizational control over the scope of resources is one of the characteristics of resources (6).

In today's world, improving work processes is so critical to organizations that they have created a strong competition between them. One of the main evidence of the provision of new services is to win the confidence and attention and encouragement of the clients. Therefore, organizations must be able to identify, use and manage these resources, and ultimately create operations and create value based on these resources, and, on the other hand, limit the physical resources available to organizations, resulting in new approaches to development. Non-physical resources and value-added procedures for product development and improvement. Processes are the most important pillars of any organization that affects executive activities, organization of human resources and even organizational structure. The main issue of this research is to investigate the effects of Islamic management principles on improving the work process, taking into account the important role of these two categories in society. Islamic approach to management studies has provided an important area of

research for management scholars. Islam as the most complete divine religion has the best instruction in the administration of society and organization. Therefore, the purpose of this study is to eliminate the vacuum by examining the impact of Islamic management dimensions on improving the work process, and the researcher seeks to answer this question. Is Islamic Management Principles Significantly Significant in Improving Work Process in Yasuj University of Medical Sciences?

## Importance and necessity of research

The need to replace the principles and principles of Islamic management, instead of current management, is mutually controversial. First of all, the West has been able to make detailed and well-documented studies and attempts at making mistakes in the field of management science, as well as in other disciplines, in a systematic way and within a specific framework, so that it can broadly To achieve their goals. Despite the fact that Western management science has been able to incorporate a very good application framework into its theories and theories, but despite its major drawbacks, all the outputs of this science cannot be relied upon and trusted, and the need for reform is felt. To do this, we need to systematize all sources and informative information that embraces the comprehensive human needs and corresponds to the realities of the universe with the help of today's scientific frameworks so that it can be applied in our management system (7).

The second aspect, which makes Islamic management knowledge essential for Islamic governments, is the ineffectiveness of Western governance in completing the Islamic state. The rapid technological advancements and complex environments today have led our organizations to survive to the mere use of Western science products, and sometimes, by justifying its abandonment, without any scientific justification or appropriate replacement, parts They will remove that science. (7).

Processes are the most important criterion and aspect of organizational interest, whose weight is even higher and more important than leadership. (5). Processes in each organization are designed to achieve the mission of the organization, to better meet the basic needs of customers and audiences with better performance. In expressing the importance of processes in the organization, it's enough that performance improvement is only achieved by improving processes and engaging employees. (8).

In such a situation, managers should be prepared for the exact support of evil policies and tricks and ways to deal with them. The importance of management, especially Islamic management, in scientific resources is not overlooked by anyone, considering that research has so far been conducted in the studied community. There is a research vacuum that the researcher completes with this realization this research vacuum, therefore, this research is of particular importance.

## Theoretical fundamentals of research

### Islamic Management

The term "Islamic management" implies that management can have two aspects of "Islamic" and "non-Islamic", and thus the question arises: what is the relationship between management as a science and between Islam as a religion, there is? This question is in fact one of the details of a more general and general question: What are the different sciences and techniques, especially human sciences, with religions, especially Islam? The purpose of Islamic management is to direct Islamic managers in their management, and in their goals to consider social justice and their ultimate purpose is to obtain God's consent and to serve the people as a form of worship and to live and livelihoods of individuals in line This management will be provided. (9). The dimensions of Islamic management in this research include:

### Planning

Planning is a process for achieving goals (10).

### Supervision and control of managers

Control and monitoring is a process that compares the contents with the nuclei, the totals with the inputs, and the predictions with the functions, and provides a clear picture of the difference or similarity between these two groups of factors for the officials and managers of the organization. (11).

### Decision making

The term decision from the point of view of management science means choosing a way in different ways, and in fact, choosing the best way to achieve the goals. (12).

### Organize

In management, organizing is considered as a process in which work is done to achieve goals by dividing work among individuals and groups of workers (11).

### Motivation

The desire to do the work depends on the individual's ability to provide a kind of need. One can define his motivation in terms of practical behavior. Those who are stimulated do more to those who do not irritate (10).

### Leadership

Leadership means the art of influencing subordinates so that they voluntarily and willingly carry out predetermined activities within the framework of certain goals (12).

### Improve the work process

The process in the word means progress or progression to the goal or step-by-step transition to a specific goal. In the system concept, the process refers to the set of interconnected activities that are implemented to create one or more definitions of design changes. Or a set of elements that are designed and executed to carry out a mission or to achieve a specific purpose. Each process begins with a specific activity and ends with a specific activity (13).

Today, leading organizations are moving from the accumulation of individual knowledge to knowledge keeping for collective gain to improve business performance. This will lead to the systematic preservation of valuable backgrounds and experiences and the proper transfer of it to employees on a large scale in the organization and will bring many benefits. The organization's need to maintain and optimize the services delivery processes. Optimal integration of scientific studies into native conditions and create synergies, strengthen processes in specialized sectors, knowledge of successful and unsuccessful experiences of various processes, create a framework for the exchange of indigenous knowledge With other organizations, the creation of grounds for increasing creativity and innovation in managers and experts of different units, as well as the orientation of the system for providing services for the recording of experiences, requires the need for attention and the use of documentation (13).

### Division of processes

In a general classification of processes, the following are:

#### 1-Main Processes:

These types of processes are the core of the company and the processes that value the company. They are implemented on a centralized basis in the company and involve direct activities from suppliers to customers.

#### 2- Support processes

These types of processes are not directly priced, but are needed to support core processes. Activities include financial management and personnel management in this group.

#### 3. Development processes

These types of processes are carried out with the aim of high level of efficiency of the value chain with the main processes and support. (14).

### Background research

Ahmadian Moghadam (2014) investigated the effect of Islamic management on the preservation and attraction of financial resources (case study: branches of export banks in Chaharmahal and Bakhtiari province). The results of this study showed that the principles of Islamic management (planning, organization, motivation, leadership, Management, supervisor and control of managers and decision makers) is important for maintaining and attracting funds in SADERAT Bank.

Zand et al. (2011) investigated the role of educational-managerial factors affecting the job development of Islamic Azad University employees. The results of correlation analysis showed that the variables: individual factors (level of literacy, service record), educational factors (frequency of participation in period Educational characteristics, characteristics of educational courses), economic factors (salary of experts, financial rewards), and management factors (supervisory status, performance evaluation) with the dependent variable of professional development of experts of Islamic Azad University have a positive and significant relationship.

## Research Method

### Research findings

The main hypothesis: Islamic management principles have a significant effect on improving the work process in Yasuj University of Medical Sciences.

**Table 1: T test results of a single sample related to the main hypothesis**

	Test value = 3				
	T	Degrees of freedom	The significance level	confidence level 95%	
				Bottom limit	Upper limit
Islamic Management Views	26.947	155	0.001	7.87	9.1413

Table 1 shows that the research variables are desirable in terms of the sample. Considering that the level of significance is less than 0.05 and according to the t-value of more than 1.96 and positive, and since the interval at 95% confidence level does not contain zero, so the zero assumption is rejected and the position of the variable of views Islamic management is desirable and in terms of respondents, Islamic management principles have a significant effect on improving the process of working in Yasuj University of Medical Sciences.

### Hypotheses

Table 2 shows that the research variables are desirable in terms of the sample. Considering that the level of significance is less than 0.05 and according to the value of t, which is more than 1.96 and positive, and considering that the interval at 95% confidence level does not contain zero, therefore, the assumption of zero is rejected and the status of dimensions of Islamic management At the level of desirable and in terms of respondents, all aspects of Islamic management have a significant effect on improving the process of working in Yasuj University of Medical Sciences.

**Table 2: T test results of a single sample related to sub hypotheses**

	Test value = 3				
	T	Degrees of freedom	The significance level	confidence level 95%	
				Bottom limit	
planning	29.5	155	0.001	13.982	16.0531
Organize	19.358	155	0.001	0.38576	0.85997
Motivation	37.14	155	0.001	14.0582	15.6611
Leadership	29.15	155	0.001	0.077411	0.712112
Control and follow	44.8	155	0.001	0.300366	0.506772
Decision making	22.5	155	0.001	0.300366	0.406222

The fitting of the regression model of research is related to the impact of Islamic management principles on improving the organization's work process

Considering the significant levels in table 3, it can be concluded that all aspects of Islamic management on improving the work process in Yasuj University of Medical Sciences have a significant effect on the 95% confidence level. Also, considering the calculated beta that determines the effect of the variables without considering the index, the programming variable with beta (355/0) has the most roles in improving the work process in Yasuj University of Medical Sciences.

**Table 3: regression coefficients**

Variable	Not standardized coefficients		Standardized coefficients	t	The significance level
	B	The standard error	BETA		
Constant	16/382	2/027	**	8/080	0/001
planning	0/644	0/116	0/355	5/534	0/001
Organize	0/366	0/156	0/352	2/348	0/020
Motivation	0/390	0/130	0/182	3/006	0/003
Leadership	0/274	0/128	0/274	3/122	0/002
Control and follow	0/281	0/130	0/118	2/001	0/001
Decision making	0/252	0/130	0/128	2/254	0/001

## Discussion and Conclusion

The present study showed that Islamic management principles have a significant effect on improving the work process in Yasuj University of Medical Sciences. All dimensions of Islamic management (planning, organizing, motivating, leadership, supervising and controlling managers and decision makers) on improving the work process it affects the University of Medical Sciences. Planning variable has played the most roles in improving the work process in Yasuj University of Medical Sciences. By identifying the priority of influencing the variables on improving the work process in Yasuj University of Yazd University, it should be appropriate on the basis of the importance of the variables and to pay more attention to planning in the organization in order to improve the work process in Yasuj University of Medical Sciences. Therefore, the findings of this study are consistent with the research by (2). Therefore, it is necessary to allocate people proportionally and correctly to the set of organizational roles and processes, prioritize programs for the reconstruction and renovation of worn out structures and inefficient processes, observance of special conditions in The selection and appointment of individuals to managerial positions in the direction of promotion of the job and the design and establishment of a feedback system for managers in identifying weaknesses and strengths of managers and correcting their weaknesses should be taken.

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# Comparing the Life Quality of Female Students with and without Primary Dysmenorrhea in Zahedan University of Medical Sciences in 2016

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## Abstract

**Background and objective:** Dysmenorrhea is the most common gynecologic complaint among adolescent and young adult females that affects women's quality of life and social activities and imposes a lot of social costs on society as a whole. This study aimed to compare the life quality among female students with and without primary dysmenorrhea.

**Method:** This case-control study was performed on 90 female students in 3 groups of 30 subjects without dysmenorrhea, with primary dysmenorrhea with back pain, and primary dysmenorrhea without back pain at Zahedan University of Medical Sciences in 2016. The Short Form-36 (SF-36) questionnaire was used to determine the score of life quality. Measures of central tendency, dispersion and frequency distribution tables (absolute and relative) were used to describe the data, as well as statistical tests of variance analysis and linear regression for data analysis.

**Results:** The score of life quality in the without dysmenorrhea group was  $549.38 \pm 108.31$ , the primary dysmenorrhea group with back pain was  $534.5 \pm 117.52$ , and the primary dysmenorrhea without back pain group was  $475.41 \pm 103.21$  and showed a significant difference in the three groups ( $P = 0.03$ ).

**Conclusion:** The results of the study showed that life quality in people with primary dysmenorrhea was significantly lower than those without dysmenorrhea.

**Key words:** Life quality, Primary dysmenorrhea, without dysmenorrhea

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## Introduction

Dysmenorrhea may be categorized into two distinct types: primary and secondary. Primary dysmenorrhea is defined as painful menses in women with normal pelvic anatomy, usually beginning during adolescence (1, 2). It also refers to the lower abdominal pain without any pelvic pathology caused by muscle contractions (cramping) and pain may radiate to the back of the legs or the lower back (3, 4). People with primary dysmenorrhea may develop symptoms such as pelvic pain, back pain, premenstrual sensation, irritability, depression, headache, nausea, vomiting, flatulence, constipation, diarrhea, fatigue and frequent urination during menstruation (5, 6). Primary dysmenorrhea starts 6–12 months after menarche (5). The pain appears during the first day of each menstrual cycle and usually lasts from 8 to 72 hours (7). Primary dysmenorrhea is the most common gynecologic complaint among adolescent females (5). The prevalence of dysmenorrhea varies between 45% and 95% in women of reproductive age (8, 9). Based on the prevalence age, primary dysmenorrhea starts at the age of 15 to 17 years and reaches its peak at 20 to 24 years of age (11). Primary dysmenorrhea is the most common reason for absence from school and work, and therefore interferes with daily life activities and imposes many social costs on society (9). Despite the high prevalence, dysmenorrhea is often poorly treated, and in many cultures it is just accepted as normal by women and girls – who just “put up with it”. I don’t think many see it as embarrassing – maybe in young girls who have just reached menarche. Quality of life represents a person’s perception of his or her overall sense of daily life and is an important benchmark based on the patient’s report (12, 13). Quality of life involves different aspects of health, welfare, and also physical, mental, and social comfort experienced by people (14). Pain is one of the major causes for poor life quality (12). Studies have reported that the life quality of women with dysmenorrhea has been reduced (18-15), although most of these studies did not distinguish between primary and secondary dysmenorrhea and only took into consideration the dysmenorrhea. By investigating the prevalence of dysmenorrhea and quality of life among girls aged 14 to 19, Suresh Kambahan and colleagues showed that life quality of these girls is low (19). In another study by Kenan et al. among women with primary dysmenorrhea, it was concluded that primary dysmenorrhea in women can cause disorders in terms of general health, occupational status and family-related activities. Lacquvidez et al also reported that women with dysmenorrhea had a significant reduction in the quality of life than the follicular and control group (20). According to previous studies, quality of life is significantly lower in people with dysmenorrhea. However, most studies have not examined the quality of life in the two groups of dysmenorrhea without dysmenorrhea and did not distinguish between primary and secondary dysmenorrhea. Furthermore, no study has been found to assess the quality of life score in healthy individuals and primary dysmenorrhea based on the existence and absence of back pain (3, 15, 19, 20). Therefore, the aim of this study was to compare the quality of life in female students with primary dysmenorrhea with and without back

pain and without dysmenorrhea at Zahedan University of Medical Sciences.

## Methods

This case-control study was performed on female students at Zahedan University of Medical Sciences in 2016. After referral and initial assessment, students entered into the study based on the inclusion criteria. The inclusion criteria included: normal menstrual cycles (21), being single, absence of secondary dysmenorrhea (1), non-use of contraceptive drugs, absence of reproductive system disease or other systemic diseases, and absence of previous gynecological interventions (21). 90 medical students participated in this study. The participants were divided into three equal groups ( $n = 30$ ) with primary dysmenorrhea with low back pain and without low back pain (pain intensity of 4/10) and without dysmenorrhea (pain intensity 0-3) based on the pain intensity and symptoms (22). Demographic characteristics of participants (age, height and weight) and pain intensity were recorded in the assessment form. After informing the objectives and stages of the study, they signed a consent form. The VAS scale was used to measure pain intensity. This scale is 10cm-long horizontal line labeled “no pain” on the far left and “worst pain ever” on the far right. It asked the participants to place a mark on the line at a point representing the severity of their pain (23). Then, the questionnaire related to quality of life was given to subjects to fill out it. The SF-36 questionnaire was used to assess the quality of life. The questionnaire consists of 36 items that measure the dimensions of physical function, social function, role limitation due to emotional problems (emotional role), role limitation due to physical problems (physical role), body pain, vitality, mental health, and general health perception. The scores range from 0 to 100; higher scores indicate a better quality of life (15). Reliability and validity of this questionnaire have been confirmed by numerous previous studies (24); ( $\alpha$  Cronbach from 0.77% to 0.90%) (correlation more than 0.40% from 0.58% to 0.95%). Data were analyzed using SPSS software version 17. Measures of central tendency, dispersion and frequency distribution tables (absolute and relative) were used to describe the data, as well as statistical tests of variance analysis and linear regression for data analysis. A significance level ( $\alpha$ ) less than 0.05 was set for statistical comparisons.

## Results

The demographic characteristics of the subjects and the risk factors for dysmenorrhea are presented in Tables 1 and 2. No significant difference was observed between the two groups in terms of age, BMI, age of first menstruation, and the average consumption of fruits and vegetables. The mean pain intensity in the group without dysmenorrhea was  $1.73 \pm 1.08$ ,  $6.86 \pm 1.52$  in the primary dysmenorrhea group with low back pain and  $6.20 \pm 1.90$  in the primary dysmenorrhea without back pain, and no significant difference was observed between the two groups of primary dysmenorrhea in terms of pain intensity ( $P = 0.2$ ). However, the mean pain intensity was significantly lower in the group without dysmenorrhea than in the two groups of primary dysmenorrhea with and without low back pain ( $P < 0.05$ ). The mean and standard deviation of the subscales of quality of life and the overall scale of quality of life are presented in Table 3. Analysis of variance showed a significant difference between the mean score of quality of life in the three groups ( $P = 0.03$ ). The quality of life score in the group without dysmenorrhea was  $549.38 \pm 108.39$ ,  $534.5 \pm 117.52$  in the primary dysmenorrhea group with low back pain and  $475.41 \pm 103.21$  in the primary dysmenorrhea group without low back pain. The pairwise comparison at a 0.05 significance level showed there was only a significant difference between the group without dysmenorrhea and primary dysmenorrhea with low back pain group ( $P = 0.001$ ). The scores obtained from a number of subscales of quality of life (physical function, energy and fatigue, emotional well-being, social functioning, pain, general health) were higher in the group without dysmenorrhea than in the two groups of primary dysmenorrhea and were lowest in the primary dysmenorrhea group without low back pain ( $P > 0.05$ ). Role limitation due to emotional health in the primary dysmenorrhea group with low back pain (LBP) was better than the other two groups and the lowest level was observed in the primary dysmenorrhea group without low back pain. Pain and general health scores in the group without dysmenorrhea were better than the other two groups and the lowest level was observed in the primary

dysmenorrhea group without low back pain. There was a significant difference between the two general subscales of the quality of life in the three groups ( $P = 0.03$ ), which was better in the group without dysmenorrhea than in the other two groups and was lowest in the primary dysmenorrhea group without back pain. Mental health was better in the primary dysmenorrhea group with low back pain than in the other two groups and was lowest in the primary dysmenorrhea without back pain ( $P = 0.06$ ). In addition, the quality of life score varied among the studied groups based on bleeding volume, familial history of dysmenorrhea and pain in lower abdominal area without menstrual periods (Table 4); the quality of life score in those with a history of dysmenorrhea showed a significant difference between the three groups ( $P = 0.001$ ), so that it was better in the primary dysmenorrhea group with low back pain and with a higher percentage of familial history of dysmenorrhea and was lowest in the primary dysmenorrhea group without back pain compared to the other two groups. Furthermore, the quality of life score showed that there was a significant difference between the three groups in those with high menstrual flow ( $P = 0.04$ ), that is, the quality of life score was better in the group without dysmenorrhea and it was lowest in the primary dysmenorrhea group without low back pain. Regression analysis was used to identify predictive variables. According to the results, this model is generally significant ( $F = 5.61$ ,  $P = 0.005$ ). However, the study group and the group with pain in lower abdominal area on non-menstrual days remained predictive in quality of life model (Table 5). Indeed, there was a negative relationship between quality of life and the study group ( $B = -30.41$ ,  $t = -2.129$ ,  $P = 0.03$ ), so that for each unit change (class or group studied), the quality of life score declined 30 points. Lower abdominal pain without menstrual periods was another predictive variable, which showed a positive relationship with quality of life ( $B = 65.74$ ,  $t = 2.043$ ,  $P = 0.04$ ), so that in comparison with those with lower-abdominal pain on non-menstrual days, the quality of life score for those without lower-abdominal on non-menstrual days was better (66 points).

**Table 1: Demographic characteristics of the studied groups**

Group	Without dysmenorrhea	Primary dysmenorrhea with low back pain	Primary dysmenorrhea without low back pain	P-value
Age	$22.10 \pm 3.33^a$	$21.03 \pm 1.77$	$22.03 \pm 2.55$	0.21% <sup>b</sup>
BMI	$20.96 \pm 2.57$	$21.9 \pm 3.13$	$21.98 \pm 3.56$	0.37%
Age of first menstrual cycle	$13.31 \pm 1.60$	$12.66 \pm 1.26$	$13.26 \pm 1.72$	0.20%
Average consumption of vegetable <sup>c</sup>	$1.03 \pm 0.82$	$1.03 \pm 0.65$	$1.13 \pm 0.64$	0.82%
Average fruit consumption <sup>d</sup>	$1.86 \pm 2.73$	$1.06 \pm 0.57$	$1.83 \pm 1.42$	0.15%

a refers to mean and standard deviation

b refers to  $p < 0.05$ : significance level

c (unit) 1 cup of raw vegetable, one-half cup of vegetables and one-half cup of vegetable juice (unit) refers to an average fruit

**Table 2: Frequency distribution of characteristics related to the menstrual cycle in the subjects studied by group**

Group	Without dysmenorrhea	Primary dysmenorrhea with low back pain	Primary dysmenorrhea without low back pain	P-value
Bleeding volume				0.024
high	(10%)2	(60%) 12	(30%)6	
moderate and low	(40%)28	(25%.7)18	(34%.3)24	
Lower-abdominal pain on non-menstrual days				0.07
Yes	(7.1%) 1	(42.9%)6	(50%)7	
No	(38.2%)29	(31.6%)24	(30.3%)23	
Family history				0.07%
Yes	(22.2%)10	(37.8%)17	(40%)18	
No	(44.4%)20	(28.9%)13	(26.7%)12	

\* To perform a chi-square test, two groups of primary dysmenorrhea with and without back pain were combined and then analyzed. (Chi square = 5.12 and Df = 1)

**Table 3: The mean and standard deviation of quality of life score in general and in terms of different dimensions in the three studied groups**

Group Variable	Without dysmenorrhea	Primary dysmenorrhea with low back pain	Primary dysmenorrhea without low back pain	P-value
Physical function	85.83 ±10.99	85.00 ±16.45	81.36± 15.51	42%**
Limitation role due to Physical Health	67.50 ±25.55	71.66 ±34.57	69.16 ±31.95	60%
Limitation role due to emotional health	45.55 ±36.60	60.00 ±46.65	31.11 ±36.02	0.04%
Energy / fatigue	62.66 ±19.94	59.16± 18.89	55.66 ±18.64	20%
Emotional well-being	69.33 ±17.80	67.33 ±19.71	63.86 ±18.80	49%
Social functioning	65.83 ±21.50	63.33 ±21.50	55.00 ±22.40	18%
Pain	78.33 ±14.46	59.50 ±25.05	58.23 ±19.71	0.001
General health	74.33 ±13.94	68.50 ±18.1	61.00 ±16.26	0.001
Physical health	306.00±44.16	284.66±67.30	269.76±53.58	0.03%
Mental health	243.38±75.71	249.83±82.91	205.64±75.6	0.06%
Quality of Life	549.38±108.31	534.50±117.52	475.41±103.21	0.03%

\*\* P <0.05 is significant.

**Table 4: Mean and standard deviation of quality of life score according to family history, bleeding volume and lower-abdominal pain on non-menstrual days in three groups**

Group Variable		Without dysmenorrhea	Primary dysmenorrhea with low back pain	Primary dysmenorrhea without low back pain	P-value
Family history	Yes	556.98 ±108.5	578.28±11.30	451.61± 79.76	0.001**
	No	545.5 ±111.04	477.24±104.35	511.11±126.22	
Bleeding volume	Very high	623.25 ±37.83	564.94±135.77	418.02±78.64	0.04%
	moderate to low	544.11± 110.06	514.20±102.68	489.75±104.94	0.19%
Lower-abdominal pain on non-menstrual days	Yes	596.50	439.44±72.40	440.54±79.15	0.19%
	No	547.76 ±109.85	558.26±115.45	486.02±108.75	0.06%

\* Mean and standard deviation.

\*\* P <0.05 is significant.

**Table 5: Factors affecting the quality of life score of the subjects**

Model	Non-standard coefficient of determination		Standard coefficient of determination	T test	Significance level
	B	Sig .Error	Beta		
Group	-30.41	14.28	-0.22%	-2.1	0.03%
Lower-abdominal pain on non-menstrual days	65.74	32.17	0.21%	2.0%	0.04%

## Discussion

The results of this study showed that there is a difference between the quality of life score in the three groups studied. The quality of life score in the group without primary dysmenorrhea is higher than that of the other two groups and is lower in the primary dysmenorrhea group without low back pain. These results are in line with the previous studies that compared the quality of life score in the two groups of dysmenorrhea and without dysmenorrhea, indicating that the quality of life score in the group without dysmenorrhea was significantly better than that of the dysmenorrhea group (3, 19, 25). For example, by investigating the prevalence of dysmenorrhea and quality of life among girls, Suresh Kambahan and colleagues showed that bad dysmenorrhoea reduced quality of life.. They evaluated the dysmenorrhea in general and did not distinguish between the two groups of primary and secondary dysmenorrhea, and only two groups, dysmenorrhea and without dysmenorrhea were compared. In another study by Paria Kenan et al. (2015) among women with primary dysmenorrhea, it was concluded that primary dysmenorrhea in women can cause disorders in terms of general health, occupational status and family-related activities (26). In their study, they evaluated the impact of exercise on reducing pain and improving the quality of life in women with primary dysmenorrhea and all subjects who participated in the study and no comparison was made between the groups with dysmenorrhea and without dysmenorrhea. Lacquidez et al. (2014) also reported that women with dysmenorrhea had a significant reduction in the quality of life than those in follicular and control group (25). Sample size was lower in their study and comparison was made between the two groups of primary dysmenorrhea and non-dysmenorrhea. The scores obtained from a number of subscales of quality of life (physical function, energy and fatigue, emotional well-being, social functioning, pain, general health) were higher in the group without dysmenorrhea than those in the two groups of primary dysmenorrhea. These results are in line with the results of a study by Bernard et al. (2010). They reported that an increase in pain intensity of dysmenorrhea led to a decrease in the average score obtained from all subscales of SF36, and in general, any pain or disturbance, menstrual or non-menstrual may have made them think they had a low quality of life (15). However, there is no distinction between primary and secondary dysmenorrhea and participants with dysmenorrhea and without dysmenorrhea were evaluated. Dysmenorrhea associated with physical impairment may lead to a decrease in the quality of life in individuals. To the best of our knowledge,

no study has so far been carried out to compare the quality of life score in healthy individuals and those with primary dysmenorrhea in terms of existence and absence of low back pain with dysmenorrhea. The present study compares the quality of life and various dimensions in three groups of primary dysmenorrhea with low back pain and without back pain and primary dysmenorrhea, and also evaluated the risk factors affecting dysmenorrhea and quality of life. The comparison showed that the quality of life between the two groups of primary dysmenorrhea with back pain and without back pain is better in contrast to the quality of life in the primary dysmenorrhea group with back pain. Furthermore, according to the results of this study, the quality of life score varied among the studied groups based on bleeding volume, familial history of dysmenorrhea and pain in lower abdominal area without menstrual periods. Quality of life was better in people with a history of familial dysmenorrhea, which could be attributed to the fact that greater awareness of mother-daughter about how to deal with dysmenorrheal pain and the resulting quality of life is less affected by this disorder. In addition, the results of a study by Minalshowa Birok et al. (2017) indicated that people with medical education and health literacy were found to be more knowledgeable about the methods of coping with dysmenorrhea and those with non-medical education had not good attitudes toward dysmenorrhea (27). In addition, in a study by Palot et al., it was found that the daughters of mothers who have menstrual complaints also experience menstrual disorder because of observing and learning about menstruation from their mothers (9). The results of previous studies also have shown that there is a positive relationship between the severity of dysmenorrhea and familial history of dysmenorrhea due to modeling the behavior of girls from mothers and sisters as well as genetic factors (28). Perhaps having a family history of dysmenorrhea has led to an increasing maternal literacy in coping with dysmenorrheal problems and, consequently, the transfer of mothers' experiences to girls in how to cope with menstrual cramping, which makes their quality of life less affected. Therefore, the mean of quality of life in the primary dysmenorrhea group with low back pain and with a higher percentage of family history of dysmenorrhea may be greater than the group with primary dysmenorrhea without low back pain. In this study, the pain intensity is higher in the group with primary dysmenorrhea than in the group without back pain and a greater percentage of people have increased blood volume as well. These results are consistent with the results of a study by Habibi et al., showing that the pain intensity of dysmenorrhea is related to increased bleeding volume (29). On the other hand, the findings of a prospective study

on Chinese female students showed that dysmenorrhea is associated with severe bleeding. Additionally, the results of a cross-sectional study on Iranian women aged 16-56 suggested a positive correlation between bleeding volume and severity of menstrual pain (30). Therefore, it is likely that people with primary dysmenorrhea and low back pain have strongly followed their medical treatments and recommendations (using painkillers or analgesic) and health measures to cope with these complications, they are less likely to be affected by their daily routine. So the quality of life in this group is higher. The results also indicate that in comparison to the primary dysmenorrhea group with low back pain, a greater percentage of people in the primary dysmenorrhea group have no low back pain. The results also show that, in comparison with the primary dysmenorrhea group with low back pain, a greater percentage of participants in the primary dysmenorrhea group without low back pain experience lower abdominal pain in non-menstrual days.

## Conclusion

Primary dysmenorrhea is described as common gynecologic complaint among adolescent females. The physical and mental health of the girls affected by primary dysmenorrhea and their quality of life decreases significantly resulting in disruption in their everyday life activities. Therefore, it is suggested that researchers and providers of health services consider dysmenorrhea as an important health issue in women and take some measures towards designing appropriate interventional studies to reduce the factors affecting dysmenorrhea. It is also advisable that increasing information on how to deal with this disorder is included in the education programs for the education of girls and mothers so that the disorder is less affected by the daily lives of individuals.

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# Retained placenta managed surgically by hysterotomy: A case report

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## Abstract

**Introduction:** Despite developing healthcare systems and obstetrics management plans, retained placenta has remained as one of the common causes of maternal mortality especially in developing countries where access to appropriate obstetrical care is limited.

**Materials and Methods:** Although the cases suffering retained placenta can be successfully controlled by medications, some progressed cases should be managed surgically even by hysterotomy or hysterectomy. Herein, we describe a case with retained placenta after normal vaginal delivery with unsuccessful treatment with drugs and curettage and thus hysterotomy, combined with antibiotic therapy because of the evidences of phlebitis, was inevitably considered as the final treatment approach.

**Results:** Urinary examination was also normal. Because of some evidences of phlebitis and breast engorgement (localized redness and swelling, pain or burning along the length of the vein, and discovering hard and cord-like vein), infectious consultation was ordered and antibiotics (vancomycin and meropenem) were considered. The fever was controlled. In the final stage, she was discharged with the following order: ferrous sulfate (daily), propranolol (per 12 hours), and cardiovascular consultation one week after discharge.

**Conclusion:** In the present case, because of unsuccessful curettage and continuing signs of infections, we had to consider hysterotomy along with high dose of antibiotics. It seems that in our case, the optimal treatment approach was a combination of hysterotomy and removing signs of local phlebitis with antibiotics that led to complete recovery.

**Key words:** hysterotomy, surgically, placenta

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## Introduction

Retained placenta is mainly defined as the failure of placental delivery during 30 minutes after delivery and this can lead to serious maternal complications with an overall prevalence of 2% in all births [1,2]. Regarding its related risk factors, history of previous retained placenta, multiparity, preterm delivery, induced labor, and any surgical or iatrogenic injuries can increase the risk for this phenomenon [3]. Pathophysiologically, various mechanisms have been explained for retained placenta including constriction ring-reforming cervix, uterine abnormalities, any factors leading to morbid adherence of the placenta, premature induction of parturition with glucocorticoids and/or prostaglandins, any condition that reduces plasma estrogen concentration, vitamin E and selenium deficiency, and even seasonal hormonal changes [4]. Despite developing healthcare systems and obstetrics management plan, retained placenta has remained as one of the common causes of maternal mortality especially in developing countries where access to appropriate obstetrical care is limited [5]. Furthermore, although the cases suffered retained placenta can be successfully controlled by medications, some progressed cases should be managed surgically even by hysterotomy or hysterectomy. Herein, we describe a case with retained placenta after normal vaginal delivery with unsuccessful treatment with drugs and curettage and thus hysterotomy combined with antibiotic therapy, because of the evidences of phlebitis, was inevitably considered as the final treatment approach.

## Case Report

A 25-year old pregnant woman (G3P2D2) with the gestational age of 30w+2d was referred to our center with the complaints of labor pain and spotting. In her past medical history, she expressed history of childhood febrile convulsions with some episodes of rising blood pressure within the last pregnancy, however in the present condition; she had normal systolic and diastolic blood pressure. In the first pregnancy about two years ago, the neonate was born via normal vaginal delivery but died after birth. Similarly, in a second experience one year ago, a similar consequence occurred. The main reason for those events was expressed to be unicornuate uterus. No history of cerclage was reported. In drug history, she was administered progesterone supplements from the sixth week of gestation. She also expressed history of sensitivity to penicillin. In initial assessment, vital signs were normal with systolic/diastolic blood pressure of 80/50 mmHg, pulse rate of 110/min, and fetal heart rate of 140/min. Her contractions were recorded every 6 minutes per 30 seconds duration. In examination by speculum, a dilatation of 2cm was revealed with the evidence of spotting. In obstetric ultrasonography, cephalic presentation was recorded. In her prenatal record, we just found a document of ultrasonography indicating single alive fetus with variable presentation and anterior placental position and without any structural abnormality. The patient was admitted with the following order: 1) reserving two units of packed cell, 2) determining blood group, 3) testing

routine laboratory parameters, 4) hydration, 5) fetal heart rate monitoring, 6) administrating clindamycin (600mg, intravenously per 8 hours), and 7) checking urinary input/output. After reacting NST, she was ordered to ultrasonography to discover any abnormalities in placenta or uterus. Betamethasone (12mg, intramuscular) was also ordered. As soon as observing near together contractions, delivery was induced and resulted in a female neonate with Apgar score of 9 and weight of 1300 grams. However, the expulsion of placenta did not occur up to 1.5 hours after delivery. She had stable vital signs and the uterus was global and hard. No vaginal bleeding was also observed. We attempted to actively bring out the uterus followed by sending one unit of cross-match, emptying bladder, using oxytocin, and changing her position to encourage an upright position. About one hour later, the placental expulsion did not occur and thus curettage guided by ultrasonography was administered and the laboratory test was also considered, however curettage was unsuccessful. Inevitably, she was transferred to ICU for close monitoring. She complained only of a mild vertigo and on examination, a mild tachycardia (heart rate of 128/min) was revealed. So, the planning in ICU included close monitoring of vital signs and urine output, cardiology consultation, serial cells blood count, reservation of two units of cross match and four units of packed cell, antibiotic therapy with clindamycin and gentamicin and also administrating oxytocin. Two days after ICU admission and intensive caring, the patient became febrile with lowering blood pressures (systolic/diastolic blood pressures of 90/50 mmHg), tachycardia (heart rate of 140 to 150/min), tachypnea (respiratory rate of 22/min), and fever (body temperature of 40°C). No source of infection was found at physical examination, however in order, hydration and testing blood and urine culture were proposed. In infectious consultation, it was recommended to begin a combination antibiotic therapy with gentamicin, clindamycin, and meropenem. Also, in cardiology consultation, echocardiography parameters were normal with a sinus tachycardia in electrocardiography report. In initial diagnosis, a near to shock status was considered. In her serial blood tests, serum hemoglobin level gradually reduced from 12.8 to 9.2 g/dl and her white blood count adversely increased from 14000 to 22000. In other assessments, renal and liver function tests were normal. Also, coagulation tests were shown to be normal. Moreover, the results of blood and urine cultures were negative. Thus, the patient was transferred to the operation room. We proposed to do curettage, but it was unsuccessful. Therefore, the final decision was based on hysterotomy. In placental pathological assessment, unremarkable villous parenchyma with unremarkable membrane was reported. In the next step, we controlled fever, brought out the placenta by hysterotomy, followed antibiotic combination regimens and hydration. The patient began to breastfeed. The postoperative temperature was recorded as 39°C. The chest X-Ray and echocardiography was normal. Urinary examination was also normal. Because of some evidences of phlebitis and breast engorgement (localized redness and swelling, pain or burning along the length of the vein, and discovering hard and cord-like vein), infectious consultation was ordered and antibiotics (vancomycin and meropenem)

were considered. The fever was controlled. Finally, she was discharged with the following order: ferrous sulfate (daily), propranolol (per 12 hours), and cardiovascular consultation one week after discharge.

## Conclusion

Various international guidelines have given applied guidance in management of a retained placenta. According to the guidelines, the monitoring of affected women with retained placenta especially when it is accompanied with hemorrhage is based on Modified Obstetric Early Warning chart (MEOWS) [6]. This chart allows the clinicians to identify early deterioration of disease condition. In other words, this chart must be commenced at the point of diagnosing retained placenta. In management of this clinical condition, considering some points are essential. First, as soon as confirming retained placenta, arranging transfer to the obstetric units is necessary. In the first step and with the probability of massive hemorrhage, blood reservation and cross match should be considered [7]. In parallel, sending blood and urine sample to rule out the positivity to infections is also necessary [8]. In the hospital setting and the third stage has been managed physiologically revert to active management giving 10 IU of oxytocin IM and follow the Active Management of Third Stage [9]. The affected women must not be left unattended whilst the placenta remains in situ. Empty the bladder. In those who are unable to pass urine, urine catheter should be considered [10]. The mother should be helped to breastfeed or recommend her to stimulate nipples [11]. Simultaneous to supportive managements, vital signs should be monitored continuously, followed by any sign of local or generalized infection, along with hydration.

As main rules for management of a retained placenta, are, at first, perform an ultrasound examination to determine whether the placenta is trapped or adherent, is suggested [12]. If the uterus is atonic, administration of intravenous oxytocin can promote uterine contractions to help expel the placenta, but it makes manual removal possibly more difficult [13]. If partial closure of the cervix or a contracted lower uterine segment is inhibiting egress, nitroglycerine can be administered to relax the uterus and facilitate delivery [14]. For extracting placenta adherence, manual removal using local or generalized analgesia is the most successful means [15]. Because this maneuver may lead to endometritis, it should be considered concomitantly with suitable antibiotics [16]. In some trials, intraumbilical prostaglandin injection has been considered for placental expulsion [17].

Despite attempts to remove retained placenta, hysterectomy is considered as the definitive therapy for complete placenta accreta [18]. In cases where the placenta has deeply grown into the uterus, removal is only possible by hysterectomy. In fact, hysterectomy with the placenta left in situ is preferable because attempts at removal of the placenta are associated with significant hemorrhagic morbidity [19]. Occasionally, a subtotal hysterectomy can be safely performed, but persistent bleeding from the cervix

may preclude this approach and make total hysterectomy necessary [20].

In the present case, because of unsuccessful curettage and continuing signs of infections, we had to consider hysterotomy along with a high dose of antibiotics. It seems that in our case, the optimal treatment approach was a combination of hysterotomy and removing signs of local phlebitis with antibiotics that led to complete recovery.

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# Epidural Abscess Caused by Brucellosis: A Case Report and Review of Literature

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## Abstract

Brucellosis is an endemic and systemic disease characterized by a wide spectrum of signs and symptoms in different organs of body. It can be also recurrent and complicated even in patients who had a complete and appropriate antibiotic regimen. One of the rare complications is spinal epidural abscess that can cause annihilating side effects in delayed diagnosed cases. A prompt diagnosis and treatment involving surgical or nonsurgical therapies can save the patients. We reported a 42-year-old case of spinal epidural abscess due to a previous treated brucellosis. The case was treated without any need for surgical treatment including streptomycin, doxycycline and rifampin. We concluded that in those who have not any neurological deficit, it is possible to cure the patients by a prolonged antibiotic regimen without any surgery.

**Key words:** epidural abscess, brucellosis, case report

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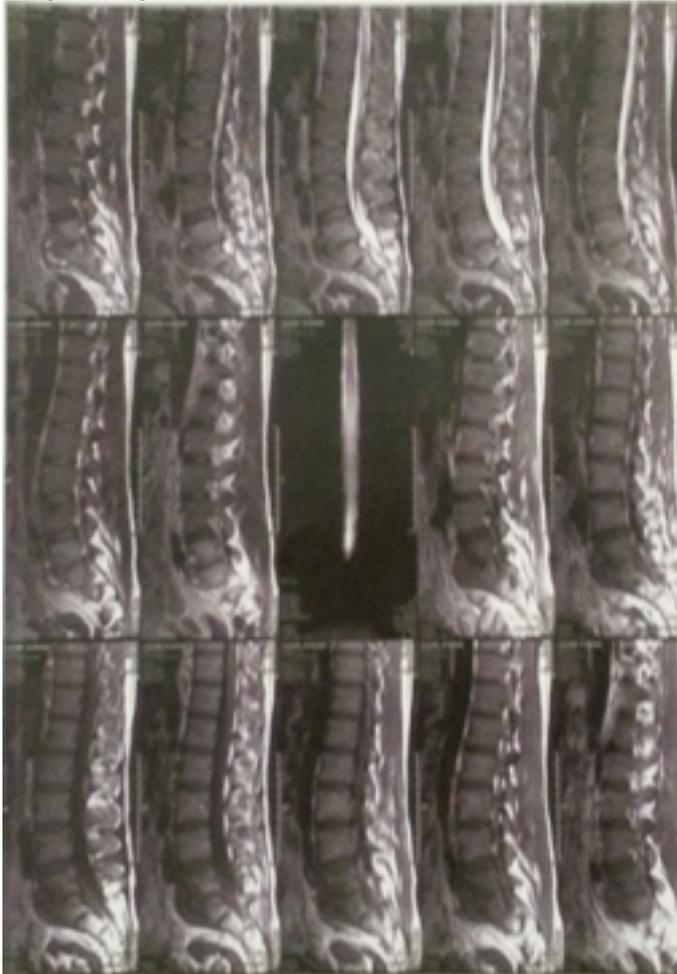
## Introduction

Brucellosis is a bacterial zoonosis disease caused by *Brucella* coccobacilli. There are six species of *Brucella* (*B. abortus*, *B. suis*, *B. canis*, *B. melitensis*) which can infect the human population. It can be epidemic in some regions of the world such as Mediterranean countries, India, South America and Arabian Peninsula [1]. It is transmitted by using the infected milk products or direct contact with the infected animals. The patients complain mostly of fever, myalgia and arthralgia [2]. In addition to gastrointestinal, hepatobiliary and cardiovascular complications, there are also some systemic effects in the musculoskeletal system like arthritis, spondylodiscitis, bursitis and osteomyelitis [3]. Totally, the rate of spinal side effects is about 2 to 9.7% [4,5]. The most common part of the spine which involves *Brucella*, is the lumbar area [6]. While the cervical area is involved very rarely it has the worst prognosis [7]. According to many studies, surgery is not mandatory for treating spinal brucellosis, but most of the cervical cases need surgical intervention [6]. We report a case of epidural abscess due to an old Brucellosis which was managed by antibiotic therapy without any need for surgery.

## Case Report

A 42 year old man suffering from fatigue and low back pain for 9 months presented to our clinic. One year earlier he had gone to another hospital for a long term fever with malaise and night sweating and a history of fresh sheep cheese consumption. In that time he was treated by Doxycycline 100 mg BD and Rifampin 300 mg BD because of positive tests of brucellosis. But after treatment he had a low back pain without any accompanying signs or symptoms which had not responded to any pain relievers. Vital signs were as follows: temperature: 37.3oC, blood pressure: 130/80 mm Hg, pulse rate: 72/min, respiratory rate: 12/min. A spasm was seen in paravertebral muscles with mild tenderness in palpating the L5-S1 area along with restricted lumbar movements. No neurological deficit was determined. CBC differentiation test was normal.

**Figure 1. Sagittal image showing contrast enhancement in L5-S1 vertebral bodies with enhancing abscess formation in epidural part.**

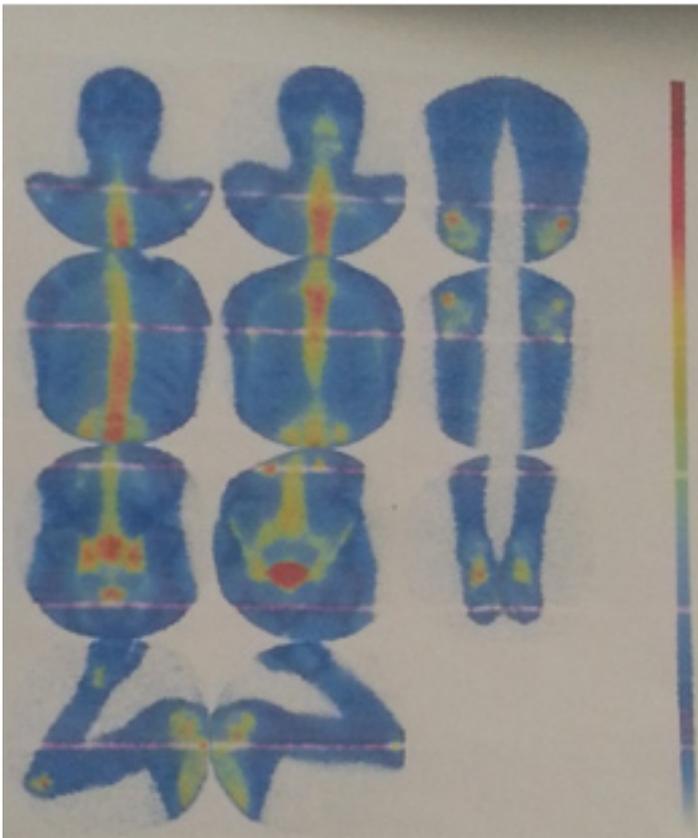


The erythrocyte sedimentation rate was 38 mm/hr and C-reactive protein was 3+. The Wright sero-agglutination titer was over 1/160, 2ME was 1/80 and the Brucella anti-human globulin titer was 1/640. Magnetic resonance imaging (MRI) of the lumbar area demonstrated L5-S1 disc degeneration with paravertebral soft tissue collection and epidural cystic hernia compressing thecal sac suggesting discitis abscess (Figure 1).

The whole body bone scan showed abnormal increased uptake of the sacral body which resulted in osteomyelitis in the sacral body (Figure 2).

A regimen of streptomycin for 20 days was started and then it was substituted with doxycycline 100 mg BD and Rifampin 600mg/day for 12 weeks via the consultation of neurosurgery and infectious diseases services. The symptoms were resolved quickly. MRI was repeated after the 8th week which reported no evidence of abscess and the levels of Wright and 2ME tests were 1/40. But since the body scan still reported the osteomyelitis in the sacral body, the same regimen was continued for 12 weeks more. After this period, all the laboratory tests were in an acceptable level and the bone scan was also normal. 12 months after stopping the treatment, MRI as well as the bone scan did not show any involvement of infection in the spine.

**Figure 2. Whole body scan demonstrating abnormal increased uptake in sacral body, knees and feet without any other bone lesion over the skeleton. These findings suggest osteomyelitis in sacral body, degenerative change of knees and posttraumatic changes of the ankles.**



## Discussion

Most of the patients with spinal brucellosis involvement have a slow onset. The symptoms appear gradually and sometimes worsen very quickly. The physicians usually have a delay in diagnosis because of different and non-specific manifestations [1]. Spinal brucellosis has two forms which involve focal and diffuse [8]. In the first one, the bacterium penetrates to the anterior part of the superior end plate that leads to a little bone destruction. In the second one, the organism goes to the contiguous vertebra through the infected vertebrae. Here, the osteomyelitis makes the end plate and disc mechanically instable [4]. Since there are not any specific signs or symptoms for this disease, the diagnosing spinal brucellosis needs a great conjecture. There are lots of differential diagnoses that can confuse the therapist to treat the patient in the wrong way such as discopathies, muscle spasms, trauma, bone tuberculosis and even malignancies [9,10]. Yet, the incidence of spinal brucellosis in Mediterranean countries is high [6]. As it was mentioned before, the cervical lesions have a worse prognosis than the other lesions. Colmenero et al emphasised on detecting the cervical brucellosis as soon as possible in order to treat any compression on the medulla or roots to prevent disastrous outcomes [7]. Although MRI and bone scan can demonstrate the disc pathologies, the definite diagnosis often occurs by measuring the serum anti-brucella antibody titer in blood. Commonly, the levels more than 1/160 or at least a four-fold increase in a 2 to 3 week duration is diagnostic [11].

At the time of admission, our patient gave us a history of previous brucellosis because of infected milk products consumption in the residential area of his parents which was an epidemic area of brucellosis. So there was a high suspension of spinal brucellosis for him that led us to perform specific evaluations to diagnose the disease.

There are some different treatments for brucella spondylitis which are not definite or standard therapies. Spinal brucellosis takes more time to be treated than systemic brucellosis because it is necessary to prevent the relapses and cure the infected parts of the bone [12]. Several studies have investigated good results in treating with antibiotic alone, even for the patients suffering from intradural granulomas [13,14,15]. Some researchers have established that the necessity for surgical treatment is uncommon [16], and some others showed good results in cases who had undergone surgery in addition to antibiotic therapy [17,18]. In fact, surgery is the last option in spinal brucellosis management. It may be needed in the presence of neurological deficits caused by the compressing effect of the inflammatory mass or abscess as well as the cases of certain complications like spinal instability or progressive collapse [5,9,19]. Usually, it is not essential to debride the infected vertebral body surgically until the patient does not respond to antibiotic therapy [20,21].

We have different antibiotic regimens. Aminoglycosides, rifampicin, trimethoprim sulfamethoxazole, quinolone and tetracycline are used as the therapies for brucellosis, but

there is not any standard combination. The combination of rifampin (600-900 mg/day) and doxycycline (200 mg/day) at least for 6 weeks is the most usual regimen. It depends on the therapist to decide which combination to use [13,22,23]. For treating spinal brucellosis, again we do not have any standard regimen. But commonly it is recommended to keep the treatment for 12 to 24 weeks [24]. In a multicenter, retrospective and comparative study published in 2013, the scientists figured several regimens out on 2 groups of patients involving complicated and uncomplicated types of spinal brucellosis. They evaluated 293 patients with spinal brucellosis via different antibiotic regimens. The authors concluded that there were not any significant therapeutic effects among them. The only point was the duration of treatment which was longer in complicated patients [7].

## Conclusion

Epidural abscesses of spine in brucella are an uncommon complication in patients with brucella. Mostly, it spreads haematogenously to the spine structures leading to spondylitis. Since the damage of neurological deficits are very devastating, it is necessary to diagnose it as soon as possible to prevent any permanent complication. Considering the area which is epidemic or not, early diagnosis in patients with fever, joint pain and night sweating is possible so that it can lead to a good outcome of treatment. Depending on the severity of the disease, treatment varies. In cases that have not any cure with antibiotic regimen, surgery can be indicated to prevent permanent damage.

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# Eventration of Diaphragm: A Case Report and Review of Literature

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## Abstract

Eventration of diaphragm is an uncommon congenital abnormality which is seen in newborns and adults with different manifestations. It may be unilateral, bilateral, partial or total. This abnormality is more common in males. It is usually seen in the left hemi-diaphragm. Sometimes it has no signs or symptoms. If so, there is no need to do any surgery. But in cases who suffer from any related disease, surgery is necessary.

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## Introduction

Eventration of diaphragm (ED) is defined as the abnormal elevation of a hemi-diaphragm. It may have a congenital reason or may be acquired. Congenital eventration is a developmental abnormality secondary to hypoplasia of the homolateral lung or diaphragmatic muscular aplasia leading to cardiorespiratory symptoms. In adults it is mostly because of diaphragmatic palsy through injury to the phrenic nerve that causes dyspnea [1,2]. The incidence of this anomaly is 1 in 10,000 live births. They commonly are presented with respiratory manifestations [3]. This paralysis can be due to a birth trauma or to an injury sustained in surgery on intrathoracic organs.

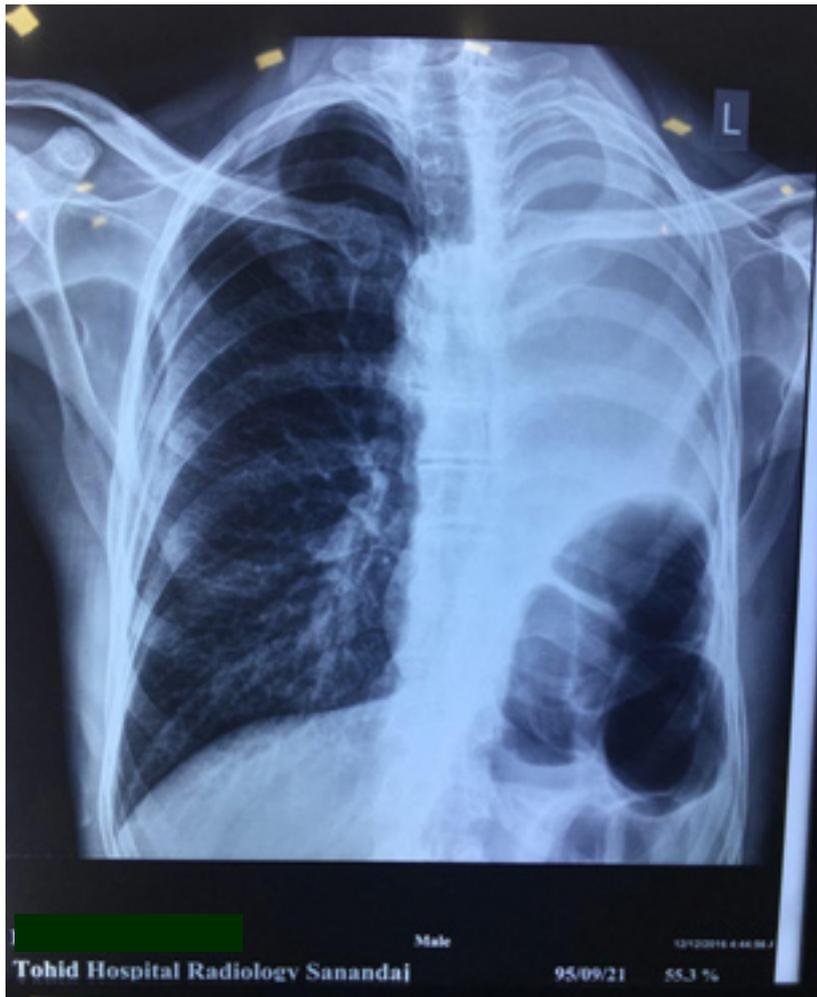
Sometimes asymptomatic ED may be treated conservatively, but symptomatic ED in children whether congenital or acquired, mostly requires surgical treatment [4, 5, 6]. If the abdominal viscera migrate to the thorax, the patient may have gastrointestinal symptoms. Cor pulmonale is the consequence of long-lasting paralysis of the diaphragm. There are also some patients without any explained cause of ED which is considered as idiopathic eventration [7].

## Case Report

A 44 year old man suffering from abdominal pain and dyspnea was referred to our hospital. Having had a respiratory infection which was treated some months before, he had a chronic abdominal pain in the left upper side. He was complaining of nausea, vomiting, weight loss and chronic constipation which had made him use analgesics. He also had orthopnea without any cough or fever.

On inspection, the patient had distress as well as decreased sounds and movements in the left lower hemithorax on auscultation. He also had paradoxical thoracic movements. All laboratory tests were normal. In chest X-ray there was a homogenous opacity in the left lower hemithorax. The upper margin of the opacity was completely

**Figure 1: PA chest X-ray demonstrating the eventration of left hemi-diaphragm with collapsed parts of left lung**



obvious in postero anterior (PA) and lateral view which was demonstrating the eventration of diaphragm (Figure 1).

In ultrasound evaluation, the left hemi-diaphragm was in an upper level compared to the right side showing the evidence of viscera migration to the thoracic cavity. Since the situation of the patient was deteriorating, it was not possible to perform any computed tomography scanning. His distress was worsened so that respiratory arrest occurred. He was quickly intubated and underwent emergency surgery.

Left postero lateral thoracotomy was done via the 6th intercostal space and plication as well as left hemi-diaphragm excision (because he had some redundant parts) was performed. Left colon flexure and spleen in the thoracic cavity were reduced to the abdominal cavity very gently (Figure 2).

In pathologic examination, microscopic evaluation showed fibro-muscular tissue moderate to marked, infiltrated by chronic inflammatory cells associated with congested vessels and interstitial edema. There was no evidence of malignancy in the prepared sections. Post-surgical X-ray showed the left diaphragm in its proper position. The patient was discharged in good health after 5 days. He had no complaint of any related disease during one year of follow up.



**Figure 2: Plication and excision of diaphragm at the position of left lateral decubitus through postero lateral incision**

## Discussion

Diaphragmatic eventration belonged to a manner in which the maximum part of the diaphragm consists of fibrous tissue with minimum amounts of muscle [8]. Rarely, total diaphragmatic eventration is investigated in the right side, but partial eventration is mostly seen in right hemi-thorax [9]. In our patient, a total eventration was seen in the left part of the thorax. In adults, it usually has no signs or symptoms and is found accidentally while assessing the chest through chest X-ray. But the presented case came to our center with abdominal pain and dyspnea. These symptoms are seen usually in obese patients following increased intra-abdominal pressure. Gastrointestinal and respiratory complaints with cardiovascular dysfunctions are related with this anomaly [10]. In some cases diaphragmatic eventration has manifested with gastric volvulus [11], intestinal strangulation [12] and recurrent sigmoid volvulus [13].

Eventration can also be due to injury to the phrenic nerve by neoplasms or surgeries that makes the differentiation in adults difficult. It can be differentiated through standard PA and lateral X-ray(?). In PA view, the eventration is diagnosed by a continuous curve originating from the mediastinum and inserted to the costal flexure [14]. Chest X-ray is a useful method for evaluation of diaphragmatic eventration with no need for respiratory fluoroscopy. CT scan and upper GI series can also be helpful [15]. Sonography is applied in order to differentiate partial eventration of phrenic nerve palsy [14].

Symptomatic ED is treated by surgical treatment through simple plication of the diaphragm [16]. It should not be performed in patients with low-level diaphragm eventrations with no mediastinal shift [17]. Respiratory mechanics are improved after plication when tidal volume and maximal breathing capacity increase through fixing the plicated diaphragm because the paradoxical movement and shift of the mediastinum are reduced [2, 5, 6, 18]. Nowadays, diaphragmatic plication by thoracoscopy has become an appropriate alternative method compared to the open technique which definitely needs advanced facilities and experience [19, 20].

Tiryaki et al evaluated the results of plication in 15 patients suffering from diaphragmatic eventration. They performed a simple and safe Diaphragmatic plication successfully in patients who had failure in conservative treatment. These researchers believe that after operation, most patients had immediate relief of symptoms. In those who had less remission, the symptoms were followed up over one year and had decreased apparently [16]. In some studies, the scientists have reported appropriate motions of diaphragm in long-term observation [6]. In the study of Tiryaki et al, the diaphragm was located normally in fluoroscopic evaluation without any evidence of paradoxical movement. Despite immobilizing the diaphragm, all their patients had not had any recurrence during the follow up [16].

In conclusion, eventration of diaphragm can have different manifestations. So the relevant differential diagnosis is very important. In those who do not have severe signs and symptoms as well as any response to conservative treatment, the choice is plication of diaphragm.

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# Effect of Education by Focus Group Discussion on Mothers' Performance and Awareness of Domestic Accidents in Children

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## Abstract

**Introduction:** Accidents are a main health threatening factor and one of the major mortality factors. In Iran, the home is the most common place for accident occurrence. The most vulnerable group in terms of accidents are children. Using a focus group approach is a method for offering solutions to such problems. In health and care areas, focus group approach is a suitable approach for discovering beliefs related to risky behaviors and to search for general perceptions about reasons for diseases. Thus the current research aims at investigating effects of education by focus group discussion on mothers' performance and awareness of domestic accidents in children.

**Methodology:** This is a quasi-experimental before-after research. Sample size was calculated as 40 using the formula. Sampling was done randomly within multi stages. Two questionnaires including mothers' performance measurement and mothers' awareness measurement questionnaires were used for data collection. First, the questionnaires were completed by mothers. Then, educational intervention was done with 6 sessions, and mothers' awareness and performance was measured by completion of questionnaires after 2 months following the sessions, and the results were compared with the results before intervention. Pair-wise t-test was used for data analysis using SPSS 22 software.

**Findings:** According to the findings, awareness and performance of mothers before intervention was  $5 \pm 2.11$  and  $14 \pm 3.42$ , and it was  $7 \pm 1.17$  and  $22 \pm 2.81$  after intervention. Results showed that mothers' awareness and performance was increased significantly after intervention compared to before intervention, and pair-wise t test showed significant difference in this regard ( $p < 0.0001$ ).

**Conclusion:** Research results showed that focus discussion approach as a comprehensive approach and an effective and practical nursing intervention is able to increase mothers' awareness and performance regarding prevention of children's domestic accidents.

**Key words:** Focus group discussion, awareness, performance, accidents

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## Introduction

Accident which is also called negligence has been long recognized as a destructive and life-threatening factor for humans. With passing traditional living and the move toward steam machines, electricity, etc. accidents have taken various shapes along with other phenomena of the industry and technology era, and accidents especially have become crucially important in the world in the past decades because of significantly reduced rates of mortality due to infectious and nutritional diseases. Thus, today the accidents are raised as a widespread problem, not only on the roads, but also in the home, school, recreational centers, sport fields, workshops, etc. [1].

In the epidemiology dictionary, accident is defined to as an unexpected event which usually causes damage in traffic, work place, home, or recreational centers [2]. The World Health Organization also defines accident as unplanned event which may lead to creating damage and disturbing an activity or work [3, 4]. Willy and Wang considered accidents as a result of negligence, inattention, and unawareness of parents and curiosity of children [5].

Various factors are involved in the emergence of accidents. Accidents are the most important health threats and causes of mortality. So, according to available statistics, 16,000 people die every day in the world because of disastrous accidents. Also, after cardiovascular diseases, accidents and injuries are the second cause of death in all ages and the first cause of death in under 40 years of age, among which prevention of accidents in children is of particular importance due to the weak physical cortical of this class of society [1].

The study by Goel et al. (2004) in India showed that the road and home were the most risky places for accidents [6]. Children experience the first accidents usually at home [7]. In a study in the USA it was found that mortality resulting from domestic accidents is more than mortality resulting from work place accidents by 4 times [8], which suggests the importance of attention to domestic accidents. The most vulnerable group in terms of accidents is children and disability of this group is causing deep recession in social activities, and 5.8 million deaths annually in the world due accidents suggest this reality. According to the most recent statistics on mortality rate in children below 6 in the country in 2007, '8 percent of mortality was related to unintentional accidents, 48.7 percent of which was allocated to domestic (non-traffic) accidents and 36.9 percent was associated with traffic accident'.

In Iran, the most common place of occurrence of accidents is at home (43%), and traffic places (39%) is in the second place as the most important locations of accidents [9]. Over the past decade, unlike the decreasing number of domestic and traffic accidents in many developed industrial countries, the trend has been increasing in developing countries and in our country. So that more than 90% of deaths from accidents occur today in low or middle income countries [10]. For example, in 2003, the first cause of the disease

burden in our country was accidents and incidents, with a resulting burden of 4,008 years per 100,000, which was a total of 2.3 times that in the United States [11]. Based on the descriptive analysis on accidents in 2007, 83 percent of the accidents occurred in the village and 16 percent in the city, and 1% were unknown. The most common reason for accidents in the home was strike, fall and poisoning [12]. Health and medical damage scores resulting from accidents is not covered by immediate outcomes related to accidents, and scope of its consequences seems wider. Death in the age group below 5 years old compared to death of people above 60 causes more increase in Years of Life Lost (YLL) in the community. Years of Life Lost in the whole community is reduced by reducing children's deaths. 20 percent of Years of Life Lost due to non-intentional accidents is related to children below 5 [13]. Damage and disabilities resulting from accidents, including death, hospitalization and reference to emergency unit, may denote the severity of the damage. In the data provided by the global childhood unintentional injury surveillance (GCUIS), which was obtained based on studies about damage to children below 12 in four specific cities, it was found that about 50 percent of victims, who had to refer to the hospital after the accident, were discharged with various types of disabilities. Also in the classification of the global burden of diseases, unintentional accidents and violence are the main causes of children's deaths, and unintentional accidents account for 90 percent of these mortalities. In a study conducted in Vietnam, the cost for compensating accidents in poor families was calculated as averaging 11 months of their income. The risk of falling below the poverty line in poor families caused by accidents is 21% higher than other poor families. Therefore, effective measures should be taken to reduce costs and damages and to eliminate the safety problems, and educational programs can serve as a precautionary approach to accident prevention and the basis for many other solutions [14].

Using focus group discussion is an approach for providing solutions and data collection and a valuable method for qualitative researchers. Focus group is a semi-structured group session which is directed by the group leader, and aims at providing solutions and collecting data about specific subjects in informal conditions [15]. In this approach, the people are able to describe their emotions and behaviors [16]. In the focus group, the emphasis should be on the interaction among group members and instead of the facilitator asking questions, group members are encouraged to communicate with each other and express their experiences [17]. The main distinctive feature of a focus group is the awareness and information which is developed through interaction among the participants. It is believed that participants not only answer questions raised by interviewer, but also answer ideas of other participants. In group interview, dynamics of the group add the information quality and quantity [16]. In health and care areas, a focus group is a suitable method for discovering beliefs related to high risk behaviors and searching general understanding of the disease reasons [17]. To this end, the research team attempted to conduct a study

aiming at investigating impact of education by focus group discussion on mothers' performance and awareness about domestic accidents in children.

## Methodology

This is a quasi-experimental before-after research work. The population included all families with children 6 months – 6 years under coverage of medical center of Zabol city. Sample size was determined as 80 based on a pilot study on 10 individuals and using a formula of comparing averages given confidence coefficient of 95 percent and test power of 80. Sample size was calculated as 40 with 10 percent probable sample drop out. Multi-stage random sampling was done and samples were selected based on inclusion criteria. Entry criteria included: 1- Mothers who have children from 6 months to 6 years of age. 2. Not having diagnosed physical disabilities in children. 3. Not having mental disabilities diagnosed in children. 4. Providing written consent of parents of children 6 months to 6 years for visit and attendance in sessions. Exclusion criteria included: 1. Reluctance to continue cooperation at the study stages. 2- Absence of more than once in focus group discussions. 3- Occurrence of incidents for the person so that she was unable to continue cooperation, such as death, accident, immigration. 4- Parents' inaccessibility when completing the checklist and post-test questionnaire. 5- Incomplete filling out of the checklist. Three types of questionnaires were used in order to collect data. Mother demographic data questionnaire included information such as age, education level, occupation, and number of children. Mothers' awareness measurement questionnaire measured awareness of mothers regarding domestic accidents in the children, and it was first used by Ali Nejad et al., and its content validity was supported by 8 experts in health education. In addition, its reliability was obtained using Cronbach alpha as 0.83. This questionnaire includes 8 double-choice items as Yes and No selections. Every Yes choice is scored as 1 and No choice is scored as 0. In order to interpret the questionnaire, scores of all items are summed. 0-2 score denotes poor awareness, score 3-5 denotes average awareness, and score 6-8 denotes optimal awareness of mothers [32]. Mothers' performance measurement questionnaires were used for measuring performance of mothers related to accident occurrence. Ali Nejad et al. confirmed its content validity by sending it to 8 experts of health education. Its reliability was obtained using Cronbach alpha as 0.81, which suggests optimal reliability of the questionnaire. This tool contains 6 items which are measured by *always* (4), *mostly* (3), *sometimes* (2), *rarely* (1), and *never* (0) scores. In order to interpret the questionnaire, scores of all items were summed. Score 0-4 denotes very poor performance, 5-9 denotes poor performance, 10-14 denotes moderate performance, 15- 19 denotes good performance, and 20 -24 denotes excellent performance [32].

First, the questionnaires were completed by mothers. Following primary data analysis and determining educational needs of mothers, educational intervention was done in 6 sessions based on the specified planning,

and then 2 months after focus group discussions, mothers' awareness and performance was measured again by the questionnaires, and its results were compared with the results before intervention. Educational intervention was done during 45-90 minutes of focus group discussion method.

Following data collection, data were analyzed using a central index and index of dispersion and pair-wise t-test by SPSS software version 22. The significance level was considered less than 0.05.

## Findings

40 mothers were evaluated in this study. The average age of these people was 30.22. Most mothers (70%) were over the age of 35, were housewives (87.5%), had educational level below high school diploma (55%) and had 3-4 children (50%). Data analysis showed that 17.5 percent of the mothers had poor awareness, 52.5 percent had moderate awareness and 30 percent had optimal level of awareness about domestic accidents in children before the intervention. Also, before the intervention, 10 percent of mothers had very poor performance, 25 percent had poor performance, 45 percent had moderate performance, 15 percent had good performance and 30 percent had excellent performance in case of domestic accidents in children. Findings showed that 35 percent of mothers had moderate awareness and 65 percent had optimal awareness about domestic accidents in children after intervention. 5 percent of mothers had poor performance, 25 percent moderate performance, 20 percent good performance, and 50 percent excellent performance about domestic accidents in children.

According to the findings, mothers' awareness and performance was significantly increased after intervention compared to before intervention, and pair-wise t-test also shows significant difference in this regards ( $p < 0.0001$ ). Findings in the table indicate that average awareness and performance of mothers before intervention was  $14 \pm 3.42$  and  $5 \pm 2.11$ , respectively. Considering interpretation of total score of awareness and performance, the mothers under study in this work had moderate level of awareness and performance regarding domestic accidents. In addition, findings showed that average awareness and performance of mothers after intervention was  $7 \pm 1.17$  and  $22 \pm 2.81$ , respectively. Considering interpretation of total score of performance and awareness, the mothers under study showed an optimal level of excellent awareness and performance regarding domestic accidents after intervention (Table 1).

## Discussion

Mothers' readiness for acting properly in order to avoid domestic accidents in children requires shaping their behavior, and increasing awareness of mothers is the primary step for developing correct behavior. Increasing mothers' awareness regarding domestic accidents and training about its risk factors is crucially important.

**Table 1: Comparison of mothers' awareness and performance about domestic accidents in children before and after intervention**

Variable	Before intervention	After intervention	Test result	P-Value
	Mean $\pm$ SD	Mean $\pm$ SD		
Awareness	5 $\pm$ 2.11	7 $\pm$ 1.17	10.13	<0.0001
Performance	14 $\pm$ 3.42	22 $\pm$ 2.81	4.87	< 0.0001

Research findings showed that mothers' awareness was at a moderate level before intervention. The reason for the lack of general awareness in this regard before the intervention can be due to lack of promotion by mass media, lack of relevant meetings by the health care staff and negligence in prevention and focus on treatment, but after education, the mean score of mothers' awareness was significantly increased. These findings are similar to those of other studies, including Kerbi [18], Mazlumi [19], Ghaffari [20] and Gamig [21]. In these studies, most of the research samples had a low or moderate level of awareness before training, but awareness increased after training and most of the trained people enjoyed a high degree of awareness and these results were consistent with the results of our intervention.

Findings by Park on cervical cancer showed that significant difference was developed between intervention and control group in terms of awareness after educational intervention [22]. The intervention group showed significant increase in awareness after educational intervention. In the study by Clear, which was conducted using Health Belief Model on status of Jamaican and Haitian men about prostate cancer, results indicated that awareness of Haitian men was at a low to moderate level without education, which is consistent with results obtained from intervention in this work. Measuring mothers' performance regarding domestic accidents in children before and after intervention was the other goal in this research. Results showed that mothers' performance in this regard was 14  $\pm$ 3.42 before intervention which suggests a moderate level of performance in mothers. But it reached to 22  $\pm$ 2.81 after intervention, which implied that educational information promoted mothers' performance from moderate to excellent.

Concerning mothers' performance, results showed that mothers' performance score regarding prevention and control of domestic accidents in children as well as the way of dealing with injured children improved after education. Overall, mothers' performance after intervention was significantly promoted. In the study by Mazlumi, average performance score increased to 19.36 from 15.11 after intervention and it was indicated that inadequate performance of mothers before intervention was probably low awareness level and ignorance about its necessity [19]. No significant difference was observed in terms of performance before intervention in the two groups in the studies by Ghaffari [20] and Sharifirad [24], and performance of both groups was at a similar level before intervention, but average performance scores were significantly increased in the intervention group compared to the control group. Findings by Park [25], Karimi et al. and Rahimi Kian et al. are also consistent

with the findings in the current work, and imply effect of education on adopting expected behavior or performance. The study of Rahimi Kian et al. about using education by Health Belief Model in selection of delivery type (normal or cesarean section) indicated that there was significant difference in performance both in the intervention and control groups after intervention, but mean scores of the intervention group were higher than the control group, and this difference was significant [26, 27].

The findings by Tabeshian and Farokh were inconsistent with findings of the current study [28], so that mean awareness and attitude scores before and after educational intervention showed significant difference, but mean performance scores before and after intervention showed no significant difference. No change was observed in their performance probably due to lack of pursuing the educated material and high preoccupation of the research subjects. Based on the results, it was found that the higher the number of children, the greater the awareness and performance of mothers in domestic accidents, which could be due to the increased experience of mothers with children. Also, the results showed that the higher the level of maternal education, the awareness and performance of mothers about domestic accidents in children increases. A study by Eldosoky et al. found that educated mothers and mothers with high socioeconomic status had a high level of home-safety for domestic incidents that was consistent with the current study [29]. However, in a study by Hatamabadi et al., it was found that level of education is not directly correlated with safety measures of mother [30]. This difference is likely to be related to the varying sample size, research environment or culture and customs of the research population.

In the current study, a statistically significant relationship was observed between occupational status of mothers and their awareness and performance about domestic accidents in children, which may be due to such factors as higher literacy, better economic status, and better living facilities. While in a study by Hatamabadi et al. it was found that occupational status is not directly correlated with safety measures of mothers [30]. This difference is likely to be related to the varying sample size, research environment or culture and customs of the research population.

## Conclusion

Research findings suggested that focus group discussion as a comprehensive approach and an effective and practical nursing intervention is capable of increasing mothers' performance and awareness regarding prevention of

domestic accidents in children. Implementing education as focus group discussion leads to more effective outcomes, especially in the safety area. Considering research findings on application of focus group discussion as an educational method for preventing domestic accidents in children, effective outcomes of this approach can be used in this sensitive and important issue. Given significance of education role in promoting accident preventive behaviors and considering the fact that unsafe houses have widespread consequences for children such as hospitalization, disability, and death in some cases, necessity for education in a wider range using various means in the community is needed more than ever, and it should be considered as a health priority in the community. Therefore, this approach can be recommended as a guide for progress of educational programs beside other health care, especially for families with children under 6 years old.

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# Patient safety culture from the perspective of emergency nurses

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## Abstract

**Introduction:** Research conducted in the area of patient safety suggests that the probability of occurrence of medical errors in the emergency unit is more than other units. Therefore, evaluating the factors, which are probably associated with occurrence of these problems in the emergency unit, is essential. The current research was conducted to evaluate patient safety culture status from the perspective of nurses working in emergency units of educational and therapeutic centers affiliated to Tabriz University of Medical Sciences.

**Methodology:** This research is a descriptive study. It was conducted using convenience sampling method. The research subjects included all nurses working in emergency units of educational and therapeutic centers affiliated to Tabriz University of Medical Sciences (N = 192). All subjects completed the HSOPSC (Hospital Survey On Patient Safety Culture) questionnaire and the collected data were analyzed using SPSS software.

**Findings:** Based on the research findings, 78.6% of nurses working in emergency units did not report any error during the last 12 months, and 52.1% of nurses working in emergency units reported that observing the safety principles in the units is at the acceptable level. Based on the research findings, the score of 8 dimensions out of 12 dimensions of the patient safety culture is under 50%. Then team work dimension in units with 66.15 was found as the most powerful dimension and the non-punishment response to errors with 18.57% was found as the weakest dimension of the patient safety culture in this research.

**Conclusion:** As one of the most important findings of this research was lack of reporting errors by emergency unit nursing staff, it seems that some actions need to be taken so that employees can report their errors without fear of being reproached. Paying attention to the role of management and leadership plays a key role in creating such a climate.

**Key words:** patient safety culture, emergency unit, patient safety

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## Introduction

As the emergency unit is the first line of providing the service and one of the most important units of a hospital, its staff performance would have a high impact on the performance of other staff members and patients' satisfaction (1). This unit admits about 30 million patients annually and provides urgent health care for them. This large number of admissions limits the communication between the patient and the nursing staff and medical errors and waiting time of patients to receive medical care will be increased (2-2). Research conducted on safety suggests that the probability of occurrence of medical errors and mistakes in this unit is higher than that in other units (6). Thus, evaluating the factors associated with occurrence of these problems in the emergency unit is essential (2-5). Experts argue that the patient safety culture plays a vital role in improving the safety level of patients in the treatment centers (7). The safety culture as one of the most important factors in patient safety in hospitals and is a set of attitudes, beliefs and values of employees, determining the necessity of the safety management practices of the organization. Additionally, safety culture has been defined as a set of norms, attitudes and actions taken on general precautions among people working at a specific place and time (8). It is a culture in which the employees of an organization have an active and dynamic knowledge on the potential of occurrence of errors and both employees and the organization are able to identify errors and to learn from them, and take actions to perform their affairs well (9). The index of strong safety culture of management commitment to learn from errors, encouragement to team work, identification of potential risks, using the reporting system and the analysis of adverse events occurring in a hospital are related to patient safety and evaluation of the patient safety culture among the employees (10). Based on research conducted in the United States, the biggest challenge to move toward a safer health system is the change of culture, so that organizations are recommended to examine the errors that have occurred instead of reproaching the people due to their errors and mistakes and viewing them as an individual deficiency. As a result, this approach will provide the opportunity to improve the system and prevent harm (11). However, the relationship between desirable safety culture and safer care is not clear (12-13). For this reason, many studies have been conducted recently in the safety culture area, based on health staff perspective (14). The release of reports on the effects and costs of the health system due to lack of patient safety in the world makes it necessary to take actions in this regard and it requires the health system to identify the events threatening patient safety, analyze the events, develop solutions, and reform the practices. There are various mechanisms to reduce adverse events and enhance patient safety, but implementing them requires studying the current situation. Hence, this research was conducted to evaluate the patient safety culture status from the nurses' perspective in the emergency units of educational and therapeutic centers affiliated to Tabriz University of Medical Science.

## Methodology

This research is a descriptive study, conducted on all nurses working in emergency units of educational and therapeutic centers affiliated to Tabriz University of Medical Sciences. The inclusion criteria of the study included having bachelor degree in nursing and work experience of at least six months in the emergency unit, in which all nurses working in the emergency unit met the inclusion criteria of the study. In this research, HSOPSC (hospital survey on patient safety culture) questionnaire was used. This questionnaire includes 42 questions in 12 dimensions of patient safety. These dimensions include: overall employees' perception of patient safety, employees' perceptions of level of reporting of the errors and non-punishment response to errors, employees' perception of their managers' activities with regard to enhancing the safety in their units and hospitals, and employees' perception of information related to enhancing the quality in the organization, employees' perception of level of team work within the unit and at the hospital, and employees' perception of open communication in the working unit and hospital, employees' perception of feedback and dealing with errors, employees' perception of the consistency of nurses and workload, employees' perception of transfer of a patient from one unit to another unit, and so on. It includes also two questions on the score given by respondents for patient safety and the number of errors reported during the last 12 months. Finally, information related to work experience in hospital, work experience in the unit, working hours per week, specialized work experience, job and type of communication with patients, gender, age, and type of employment were examined. In this questionnaire, a 5-point Likert scale was used to obtain the respondents' views. The responses of strongly agree / agree and often / always are considered as positive answers to positive questions and the responses of strongly disagree/disagree and never / rarely are considered positive responses to negative questions. Finally, the level of each dimension or area was calculated and extracted by aggregating the percentage of positive responses to each question and dividing it by number of questions of dimension or area. The level of each of these dimensions is compared with that of the dimensions in the standard released by American Agency for Quality and Health Research, and accordingly, the areas of the system that are strong in terms of patient safety culture or the areas that are required to be enhanced are determined. Descriptive statistics such as frequency distribution tables, percentage, and ratios are used in analyzing the data.

## Findings

The population of the current research included all nurses working in emergency units of educational and therapeutic centers affiliated to Tabriz University of Medical Sciences (n=192). The research findings on demographic characteristics and background information of the subjects are summarized in Table 1.

**Table 1: Frequency distribution and percentage of respondents (nurses) based on demographic characteristics**

Variable	Level of variable	f	%	variable	Level of variable	f	%
Gender	Male	59	30.7	Working hours per week	Less than 20 hours	4	2.1
	Female	133	69.3		20-39 hours	44	22.9
					40-59 hours	113	58.9
					60-79 hours	16	8.3
					80-99 hours	11	5.7
				Over 100 years	4	2.1	
marital status	Single	64	33.3	Organizational position in hospital	Formal	84	43.8
	Married	128	66.7		Contractual	47	24.5
					Project	33	17.2
					Conventional	28	14.6
Education	Bachelor	188	97.9	Direct communication with patient	Yes	190	99
				No	2	1	
Work experience in hospital	Less than 1 year	35	18.2	Working duration related to expertise	Less than 1 year	21	10.9
	1-5 years	51	26.6		1-5 years	62	32.3
	6-10 years	56	29.2		6-10 years	59	30.7
	11-15 years	31	16.1		11-15 years	30	15.6
	16-20 years	14	7.3		16-20 years	15	7.8
	Over 21 years	5	2.6		Over 21 years	5	2.6
Work experience in emergency	Less than 1 year	37	19.3	Total respondents	192	100	
	1-5 years	76	39.6				
	6-10 years	54	28.1				
	11-15 years	18	6.4				
	16-20 years	6	3.1				
Over 21 years	1	0.5					
Lowest age= 22				Highest age=88		Mean of age=32.23	
						SD of age= 6.61	

In the current research, 190 nurses reported that they had direct communication with patients. The mean age of the participants was 32.23 years, and 69.3% of the participants were female and 66.8% of them were married and 97.9% of them had bachelor degree. Most of the participants in this research had work experience of 6 to 10 years and 43.8% of the participants in this research have a formal organizational position. In this research, the mean percentage of positive responses to various dimensions of the patient safety culture was from 18.57% to 66.15%. The mean percentage of positive responses to various dimensions of patient safety culture is shown in Table 2 (next page).

Based on the research findings, 78.6% of the participants did not report any event during the last 12 months. Observing the safety principles in the unit was at the acceptable level from the perspective of 52.1% of the participants. The number of incidents reported by staff during the last 12 months is illustrated in Table 3 and the rate of observing the safety principles in the unit from the staff perspective is illustrated in Table 4.

Based on the research findings, the dimension of "teamwork in units" with 66.15% was found as the strongest dimension and the dimension of "non-punishment dealing with errors and mistakes" with 18.57% of the positive response was found as the weakest dimension in the current research. Based on the research findings, 8 dimensions out of 12 dimensions (66%) of the patient safety culture are poor and need to be enhanced. Four dimensions out of 12 dimensions of the patient safety culture, obtained the highest score, included teamwork in units, improving the continuous organizational learning, issues related to employees, and manager expectations and actions to enhance the safety. Table 5 illustrates the mean total score of safety culture of the patient hospitals affiliated to Tabriz University of Medical Sciences.

**Table 2: The general view of respondents on each of the dimensions of patient safety culture and mean percentage of positive responses**

dimensions	Strongly disagree	disagree	No idea	agree	Strongly agree	Mean percentage of positive responses
1- Open communication channel	5.73	15.6	4.27	26.9	11.47	38.37
2- Feedback and informing others on errors	3.47	17.33	34.03	33.33	11.8	45.13
3- Frequency of reporting the unwanted incident	7.67	23.6	32.97	26.4	6.37	35.77
4- Transfer of patient information among the units and work shifts	6	23.18	29.3	32.83	8.73	41.56
5- Management support of patient safety	6.07	22.4	33.17	32.8	5.57	38.37
<b>6- Non-punishment of errors</b>	14.4	35.4	31.6	16.3	2.27	<b>18.57</b>
7- Improving continuous organizational learning	3.8	11.8	28.67	42.37	13.33	55.7
8- General understanding of patient safety	5.87	20.97	33.3	33.85	6	39.85
9- Issues related to employees	6.52	20.6	19.3	42.7	10.92	53.62
10- Manager expectation and actions to enhance safety	4.03	15.48	27.73	41.26	11.33	52.59
11- Work team among the units	5.32	22	30.5	35.55	6.77	42.32
<b>12- Team work within units</b>	2.35	14.6	16.9	52.85	13.3	<b>66.15</b>

**Table 3: Frequency distribution of the number of incidents reported during the last 12 months**

Number of incidents	f	%
<b>0</b>	<b>151</b>	<b>78.6</b>
1-2	28	14.6
3-5	11	5.6
6-10	2	1

Table 4: Frequency distribution of respondents' views on observing the safety principles in the unit

observing safety principles in unit	f	%
Excellent	15	7.8
Very good	49	25.5
acceptable	100	52.2
poor	26	13.5
very poor	2	1

Table 5: mean percentage of positive responses of total score of the patient safety culture in 15 studied hospitals

Hospital	Mean percentage of positive responses to total score of patient safety culture
<b>Imam Reza</b>	<b>40.12</b>
Shahid Madani	47.44
<b>Sina</b>	<b>53.82</b>
Children	43.57
Shohada	49.26
<b>Razi</b>	<b>34.34</b>
Taleghani	43.12
Alzahra	51.81
Alavi	48.73

## Discussion

Based on the research findings, 78.6% of nurses did not report any errors and incident during the last 12 months, which this percentage suggests intimate cultural atmosphere governing on organization. Humans can learn from their past errors and share their lessons with others, which will enhance the knowledge of people. Thus, if people can learn from the experiences of others, they can effectively prevent similar errors and mistakes in the future. An effective system, which reports the safety events of patient, is crucial part of a comprehensive patient safety culture (15). Based on the research conducted by Aljar Nadi et al in Lebanon, a significant correlation was found between a positive safety culture and an error reporting (16). Based on the research findings, the non-punishment response to errors and mistakes was found as the weakest dimension. In the research conducted by Heling et al in the Belgian hospitals, this dimension also obtained the lowest score in the patient safety culture (17). One of the factors involved in creating a positive safety culture is

the non-punishment positive response to the error (15). Based on the research findings, teamwork in units has the highest score in patient safety culture. This dimension also obtained the highest score in the research conducted by Chi Chen et al (9). Each person has a specific role in the teamwork, which it is coordinated with goals of the team or other team members (21). Health care team members take important and vital decisions daily on complex and different therapeutic actions in providing the care for patients, which these decisions affect the life and well-being of patients (22). The advantages of teamwork include reduced medical errors, improved health care quality, increased patient satisfaction, improved satisfaction of employees in dealing with work issues, and reduced burnout in healthcare experts (23). Based on the research findings, the dimension of "issues related to employees" is one of the dimensions obtained the score over 50%, while in the study conducted by Chi Chen, this dimension obtained the lowest score (20). Other dimensions with over 50% in this research were related to "the manager expectations" and "actions to enhance the safety", which these findings

are parallel to the findings of the research conducted by Rezaeian et al (24). The management and leadership to enhance the patient safety plays key role, which positive score in this dimension can suggest the positive actions of manager to enhance the safety. Based on the results, the overall safety score of emergency staff in 8 hospitals from 15 hospitals investigated in this research is below 50%. The lowest score was related to staff working in the Emergency Unit of Razi Hospital, which is regarded as a specialized psychiatric center. Given the specific sensitivities and risks, threatening the patients with psychiatric disorders, it is important to pay more attention to safety of these patients. However, the staff working in the emergency unit of Sina Hospital, operating as a poisoning and burning specialized center, obtained the highest score related to patient safety culture, and the positive safety culture in this center might decrease the number of these errors, leading to improved patient safety. Moreover, patient safety culture in the emergency unit of Imam Reza Hospital obtained the score lower than 50%, while this units operates as the largest emergency unit in the northwest of Iran and admits patients from different cities and neighboring provinces, and it is very important to pay attention to the safety issue and serious actions are needed to be taken to create a positive safety culture in this area. In the current research, dimensions, which the mean percentage of their positive response is under 50%, were 8 dimensions out of 12 dimensions of patient safety culture. Team work in emergency units, improved learning, examining the patient safety culture status from the perspective of nurses working in the emergency units affiliated to Tabriz University of medical sciences, issues related to employees and managers' expectations and actions to enhance the safety were some of the dimensions obtained the highest score.

## Conclusion

Based on the current research findings, the rate of reporting the error by emergency staff was very low and the majority of them did not report any error during the last 12 months. However, factors such as reporting the error, leadership / management, and non-punishment response to error have a key role and particular attention needs to be paid to them in order to create a positive safety culture in health care organizations (15). In this regard, management and leadership play important role in creating a positive safety culture for reporting errors, since managers should create a type of psychological safety, in which employees are completely sure on disclosure of errors, so that health care providers ensure that they will be treated with respect when they disclosure an error (18).

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# Study of Different Wheat Cultivars Using the ISSR Marker

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## Abstract

Genetic diversity and evaluation of wheat cultivars (*Triticum*) raised at the molecular level were conducted using the ISSR marker. For DNA extraction, modified Doyle and Doyle method was applied and in the next step, 9 genotypes with 14 primers were studied. In the ISSR primer, samples of certified Homa wheat and self-consumption Sayonz have the most similarity with the rest of samples. The minimum number of bands in the ISSR is 41 and the maximum number is 59. The highest percentage of ISSR is 61% and the lowest percentage is 27%. Samples of self-consumption Sayonz and certified Homa with 58% have the greatest similarity and self-consumption Sardari sample with 42% has the least similarity. Indeed, genetic diversity of self-consumption Sayonz and certified Homa is closer together.

**Key words:** genetic diversity, wheat cultivars, ISSR marker

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## Introduction

Although the human approach to medicinal products of plants has a profound background, the issue of increasing the production of these products at the level of farms and gardens assumed a new scientific form around the second half of the twentieth century. Effective use of genetic resources and hereditary reserves of plants requires knowledge of their heredity and genetic structure. To this end, researchers have used different morphological, cytogenetic and molecular markers.

### Genetic diversity

One of the basic needs of plant breeding is the awareness of the diversity of hereditary reserves and genetic relationships among plants. Genetic diversity is considered as the most important factor in the survival of creatures, including plants, against changes in environmental conditions and pests (Bahra et al., 2008). Genetic diversity arises primarily from hereditary factors and is also transmitted to later generations or progenies. In contrast to genetic variation, we have environmental diversity which results from environmental factors. Genetic diversity may be simple and can be easily observed in grains and plants like the color of flowers or grains and the presence or absence of awn in cereals. Also, genetic diversity can be complex and manifest itself in complex inherited traits such as performance and drought resistance. The existence of hereditary diversity is essential for plant breeders and without it, permanent genetic modification is not possible (Slipper & Pullman, 2008). In general, diversity and selection are two basic principles of every breeding program and the selection is subject to the existence of a desirable variety in terms of the trait under investigation. Over thousands of years, natural selection and climatic conditions have caused genetic diversity in plant sources (Sa'eidi, 2003).

Thus, genetic diversity is a work tool for breeders and to take advantage of it, one can either use the diversity in populations or obtain the desired diversity for the desirable trait in the breeding program by the selection of the right parents and their confluence if there is no variation for the desired trait (Mohammadi, 2002).

Among the factors creating genetic diversity, mutation, hybridization and entering cultivars can be mentioned (Qaranjik, 2002). Plant breeding (or synthetic evolution by mankind according to Vavilov) like natural evolution is dependent on diversity and selection (Vavilov, 1951). Hence, genetic diversity is one of the fundamental requirements for progress in plant breeding (Ramanujam et al. 1974).

### **Study of genetic diversity and factors creating diversity**

In the past, some believed that plants in the same species are not similar and thus assumed that this dissimilarity has a hereditary origin. But some others maintained that all kinds of plants and animals have been created uniformly from the beginning. This way of thinking caused some to believe that members of a species have been essentially the same without hereditary changes. Even Carl von Linné, the founder of systematic plant science, also initially thought that the plants within a stabilizing species are similar to each other. But with the emergence of evolutionary concepts and phenomena stated by Lamarck and Darwin, the possibility of variation among species was considered and it was confirmed that the evolution of species has not been possible simply and these changes have led to the creation of diversity within and between species.

### **Botany**

Wheat with the scientific name of *Triticum* is among the most important cereals. This plant exists in wild and domestic species. Wheat is among the one-year-old flowering monocotyledons and is from the Gramineae family.

### **The importance of medicinal herbs and plants**

Population growth and the urgent need to use medicinal plants as the raw material for drug production, failure to produce some essential drugs by the pharmaceutical industry and also the application of effective substances in medicinal plants in the food, cosmetic and health industries have meant that research on these types of plants have become important from the viewpoint of cultivation, production and consumption. Paying attention to the cultivation and development of medicinal herbs in the world began in 1986 since the 14th World Health Congress and has led to a growing increase in the global demand for these products. Following this, different countries have engaged in the planning for mass cultivation and production of medicinal herbs at industrial levels and productivity and use at cosmetic and health levels and at the same time, international trading of these products faced a great boom (Baqeri et al., 2005).

Iran with a specific climate situation has more than 7,500 plant species, which are 2-3 times more than the vegetation of the entire continent of Europe and it is predicted that more than 750 medicinal species exist in Iranian vegetation (Omid Beigi, 1995). In spite of this potential power, Iran's important cultivated medicinal plants are less than 10,000 hectares and in terms of species diversity under cultivation, this figure is limited to below 40 species.

### **Definition of marker and its types**

Use of genetic markers is as old as human history. The first humans (even those who have not still learned agriculture and had to collect seeds to continue their lives) unknowingly used morphological markers to recognize all kinds of seeds and fruits and wild beasts and preferred some to some others. But Mendel was perhaps the first one who used morphological or phenotypic markers in a codified and knowledge-based manner to study the inheritance of pea traits.

### **ISSR technique**

ISSR technique is a PCR-based method which includes the amplification of DNA fragment present in the replicable space between two unique and repetitive microsatellite loci with opposite directions. This technique usually benefits from microsatellites with a length of 16-25 bp as the primer of a single-primer reaction which targets at multiple genomic loci for the amplification of inter-microsatellite sequences with different sizes. Microsatellite repeats used as the primer can have two, three, four or five nucleotides. The applied primers can be attached to any point in the DNA although they are attached to one to four bases at their 3'-end or 5'-end and expand accordingly. This technique has combined most of the advantages of AFLP and microsatellite with RAPD inclusiveness. High replicability of ISSRs is probably due to the use of longer primers (16 - 25 mers) compared to shorter primers (10 - mers) of RAPD, which provides the possibility for using high bonding temperature (45 to 60° C) leading to the increased probability of binding the primer to specific points in DNA (more replicability). Studies concerning replicability demonstrated that only the weakest bands are not replicable. About 92% to 95% of the rated fragments can be digitized over DNA samples and be replicated during separate periods of PCR when they were identified using polyacrylamide. 10 ng of DNA template will produce the same duplicate products that generate 25 or 50 ng of DNA template per 20 µl of PCR. Bonding temperature depends on the percentage of the primer used and usually ranges between 45 to 60° C.

### **Plant substances**

In order to conduct molecular studies, 9 varieties of wheat species (available in Agriculture Jihad) were applied. A total of 9 leaf samples were collected (Table 3). These samples comprised fresh leaves of wheat species.

### **Primers**

To investigate the genetic relationships, 14 ISSR primers were employed.

### **Genomic DNA extraction**

To perform DNA extraction, the modified CTAB method of leaf samples before melting the ice of samples was used. To prepare 100 ml of 2% CTAB extraction buffer, the components of Table (3-4) were dissolved in 20 ml of distilled water and their PH reached 8 using 1M chloridric acid. Then, two grams of hexadecyl trimethyl ammonium bromide were dissolved in some heated distilled water and were added to the previous solution. Ultimately, the

**Table 1: ISSR primers used in this research**

No.	Primer name	Primer sequence	Bonding temperature (°C)
1	ISSR-1	5'-ACACACACACA CACA CG-3'	50
2	ISSR-2	5'-ACACACACACA CACA CT-3'	53
3	ISSR-3	5'-ACACACACACA CACA CC-3'	53
4	ISSR-4	5'-AGAGAGAGAGAGAGAGC-3'	47
5	ISSR-5	5'-AGAGAGAGAGAGAGAGT-3'	55
6	ISSR-6	5'-GAGAGAGAGAGAGAGAC-3'	47
7	ISSR-7	5'GAGAGAGAGAGAGAGAT-3'	51
8	ISSR-8	5'-CTCTCTCTCTCT CTCTG-3'	54
9	ISSR-11	5'-ACACACACACA CACA CGT-3'	52
10	ISSR-14	5'-ACACACACACA CACA CGG-3'	54
11	ISSR-15	5'-ACACACACACA CACA CGA-3'	47
12	RAMP-TAG	5'-TAGAGAGAGAGAGAGAG-3'	51
13	RAMP-GAC	5'-GACACACACACACA CACAC-3'	51
14	LK7	5'-CCACTCTCTCTCTCTCT-3'	47

**Table 2: Components of DNA extraction buffer**

Buffer components	Amount	Final concentration
Tris- HCL	1.211 g	100 mM
NaCl	8.19 g	4 M
EDTA	0.744 g	0.2% (v/v)
CTAB	2 g	2% (w / v)
Merkapto etanol	200 µl	0.5 M
Pvp	2 g	2% (w / v)

the volume of the solution reached 100 ml. The DNA extraction steps are as in Table 2 above.

Before everything, the CTAB buffer was heated at 65 ° C in Bain-Marie.

100 ml of fresh, healthy and clean leaves were completely pounded in liquid nitrogen in Chinese mortar and were powdered. Mortar and its pestle (at least in the position of contact with the leaves) should be cool before doing this. This is a recommendation to disable the nucleases in the environment and can be done by adding a little liquid nitrogen or placing in a freezer.

The leaf powder is collected in the corner of mortar and immediately before melting its ice, 800 µl of CTAB buffer were added to the mortar and were fully mixed with the leaf powder. The contents of the mortar were transferred to a tube of 2 ml and were kept for half an hour at 60° C in Bain-Marie. During this time, the tubes were slowly inverted several times. Sample size (800 µL) of isoamyl alcohol / chloroform solution (24: 1 ratio) was added at room temperature. The tubes were gently and repeatedly inverted so that the tube contents were uniformly mixed. The contents were centrifuged at 13000 rpm for 10 minutes at room temperature. The upper clear part (about 500-600 µL) was removed and poured into another tube.

Two-thirds of the volume (about 350 µL) of cold isopropanol (-20° C) was added to each tube and the contents were centrifuged at 13000 rpm for 10 minutes at 4° C. The tube contents were gently removed and DNA cluster remained at the bottom of the tube. Empty tubes with DNA cluster were placed upside down on a completely clean surface for 10 minutes so that the clusters dried. 100 µl of TE buffer was added at room temperature.

800 µl of ammonium acetate plus cold ethanol were added (1.5 ml of 2.5 M ammonium acetate plus 3.5 ml of ethanol). The last stage was performed on ice and the tubes were gently inverted several times and were then transferred to the freezer. The contents were centrifuged at 13000 rpm for 15 minutes at 4° C.

The upper part became empty. The tubes were inverted to become dry. 150 µl of TE buffer was added to each tube. Samples were stored in the tubes at room temperature. Afterwards, subsequent works were done to evaluate quantity (spectrophotometry) and quality (electrophoresis on 1.5% agarose gel of the extracted DNA). DNA of the samples was diluted up to 100 ng / µl for subsequent use.

#### **Determining the quantity of genomic DNA samples**

By using the spectrophotometer device, absorption of diluted DNA solutions at a ratio of 1:61 (5 µl of DNA stock solution plus 295 µl of sterile double distilled water) was measured at a wavelength of 261 nm (absorption

wavelength of nucleic acids) and 280 nm (absorption wavelength of proteins) and finally, the ratio of light absorption at a wavelength of 261 nm to 280 nm (261/280) which is an index of DNA purity was obtained. Further, the DNA stock concentration was calculated using the following formula:

Formula 3-1: Dilution factor (61) × 50 × absorbance at 261 nm = DNA concentration (ng / µl)

In the spectrophotometric method of DNA, each absorption unit at a wavelength of 261 nm is equivalent to 50 mg / µl of double-stranded DNA and if the ratio of absorbance of DNA solution at a wavelength of 261 nm to the absorbance at 280 nm is within the range of 1.7-1.9, this indicates that absorption is mainly due to nucleic acids and the obtained DNA quality is desirable and it enjoys high purity.

#### Determining the quality of genomic DNA samples

By using the genomic DNA electrophoresis on 1.5% agarose gel, the DNA band quality of each sample was determined. For each sample, 10 µl of extracted DNA were loaded on 1.5% agarose gel wells. The agarose gel was electrophoresed for 45 minutes at the constant voltage of 90 and then, DNA was observed and photographed under UV light in the gel doc machine.

0.8% and 1.5% agarose preparation method to determine the quantity and quality and separation of amplified fragments

Agarose powder was weighed and poured into a beaker. EDTA 10 X was diluted with distilled water with a ratio of 9:1 and EDTA 1 X was prepared in this way.

EDTA 1 X was poured into a beaker by a graduated cylinder based on the desired volume of electrophoresis tank and was slowly shaken so that the contents were mixed completely. The solution inside the beaker was placed in the microwave such that the agarose particles inside it were completely dissolved and the solution became uniform. 0.2 µl of DNA Safe Stain<sup>®</sup> was added for gel staining and after that, the intended gel was poured into the gel mold whose shoulder was also ready. The solution inside the beaker was gently poured into the electrophoresis tray. 30 minutes must pass for the agarose gel to become firm. The gel together with the tray was placed inside the electrophoresis tank and became fixed. Then, inside the tank became full of EDTA 1 X up to slightly above the gel. Components of the polymerase chain reaction

To perform PCR in a volume of 12 µl, the components provided in Table (3.5) were used.

**Table 3: Components used for PCR**

Component	Amount (µl)
PCR Kit (Mastermix)	5
Deionized water	5
Primer	1.1
Genomic DNA	1
Total	12.1

#### Time cycle and steps of polymerase chain reaction

Polymerase chain reaction was performed in the thermocycler machine (Bio Rad) with a 4-minute program of initial denaturation at 94° C, 10 primary cycles in the form of touch down (so that the temperature of the primer bonding to the template strand was considered to be 5° C higher than the actual bonding temperature) and for each cycle, 0.5 degree was reduced from the bonding temperature in order to reach the actual bonding temperature. This partly decreases the creation of pseudo-microsatellite bands which cause difficulties in scoring in normal cycles of PCR) and 30 cycles including 30 seconds of denaturation at 94° C, the recommended temperature for each primer for 45 seconds (for connecting the primers) and 2 minutes at 72° C for extension and the final extension was done at 72° C for 7 minutes.

Power and time required for PCR product electrophoresis The time needed for electrophoresis is dependent on the required temperature and the distance between the two positive and negative poles. With regard to performing the optimal separation of fragments from each other, a voltage of 90 volts was used. The electrophoresis time also depends on the weight of the bands produced by the PCR in terms of the base pairs. In this study, considering the results of initial testing and optimization of electrophoresis conditions, 2.5 hours were found to be an appropriate time for separating PCR products. The buffer required for electrophoresis is TAE with a concentration of 1 X, which is obtained through properly diluting 10 X TAE buffer with distilled water.

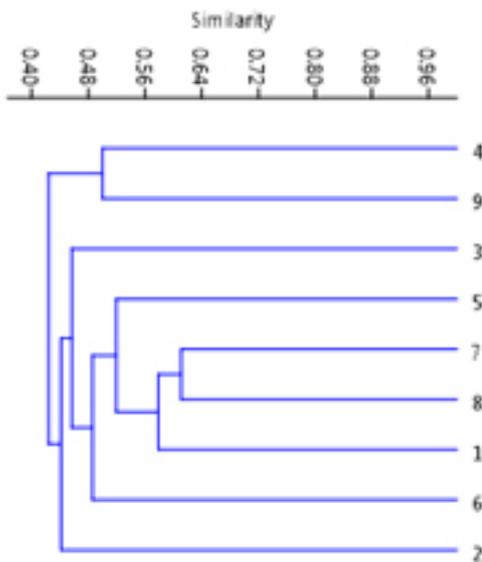
Software used in this research consists of:

- 1) Darwin 6 software
- 2) Past 3 Software

#### Phylogenetic tree diagram using the ISSR molecular marker

Drawing the evolutionary tree shows that if we put the commentary line (or in other words the cutoff line) in one place, the self-consumption Sardari sample at a genetic distance of 0.43 is separated from studied cultivars and genotypes. At a genetic distance of 0.45, the cultivars under study are divided into two main groups. The first group encompasses the samples of certified Pishtaz and certified Mihan and the second group includes Azar 2, self-consumption Sayonz, certified Homa, Parsi Madari, Sirvan Madari and certified Parsi. The Sardari sample is the farthest sample and the two samples having the greatest similarity with each other are self-consumption Sayonz and certified Homa.

**Figure: Phylogenetic tree diagram using the ISSR molecular marker**



**Table of similarity coefficient using the ISSR molecular marker**

Jaccard's Similarity Table has been provided below. The numbers represent the distance between the samples. The greater the numbers, the smaller the distances will be. Investigation of Jaccard calculation demonstrates that the samples of certified Homa and self-consumption Sayonz have the greatest similarity and the sample of self-consumption Sardari has the least similarity relative to other cultivars. In fact, the genetic diversity of certified Homa and self-consumption Sayonz are closer to each other.

Similarity coefficient using the ISSR molecular marker  
(See Table below)

### Principal Component Analysis (PCA)

Alongside cluster analysis, PCA is among the most common multivariate statistical methods in the studies about the genetic relationships of genotypes. The purpose of this analysis is to find combinations of variable P of  $x_1, x_2, \dots, x_p$  to create independent (non-correlated) indices

of  $z_1, z_2, \dots, z_p$  called principal components (PC). PCs express different aspects of the properties of the initial data due to lack of correlation and are arranged in the way that  $z_1$  has the greatest amount of changes and  $z_2$  is placed in the next position and so on. PCA is carried out using variance-covariance matrix or correlation matrix. But regarding the molecular data, similarity or distance matrix between individuals is applied as the PCA input. In using the molecular data in principal component analysis, there is a possibility of negative stagnant roots and to eliminate this problem, Franco et al. (1997) proposed that the similarity or distance matrix should be converted using the formula  $s'_{ij} = s_{ij} - s_i - s_j + S$ , in which  $s'_{ij}$  is the similarity matrix between the individual  $S_{i,j}$  and  $s_j$  is respectively the average similarity coefficients for the individual  $i$ th and  $j$ th and  $S$  is the average of total similarity coefficients.

As to the quantitative properties, in most cases, the first two or three PCs justify the highest amount of changes related to the initial data (around 75%-80%) and these PCs are used for graphic display for grouping the genotypes. But in connection with the molecular data, the first two or three PCs justify a maximum of about 10% -20% of the changes related to the initial changes in the markers. Although these results may not be statistically appropriate for PCA and graphic display, they genetically suggest the proper sampling of the markers from the whole genome. Accordingly, each of the markers used is from different genome sections and thus has less correlation. In principal component analysis using the molecular data, it should be considered that the graphic display and grouping based on two or three PCs cannot represent the total changes of the initial variables. As a result, it is recommended that grouping is done based on the great number of PCs which justify more changes. Selecting the number of PCs in this state can be based on the stagnant roots of PCs. PCs with the stagnant root larger than one should be used as PCs effective in grouping (Izony & Prits, 1991). Another problem in PCA is related to the missing data, which is common with molecular data. In PCA, missing data is simply replaced by the average of the relevant attribute (variable) when calculating the distance or similarity matrix. Consequently, genotypes with more missing data are located near the

	1	2	3	4	5	6	7	8	9
1	1	0.512195	0.526316	0.545455	0.5	0.485714	0.578947	0.578947	0.428571
2	0.512195	1	0.414634	0.378378	0.425	0.333333	0.5	0.463415	0.388889
3	0.526316	0.414634	1	0.342857	0.432432	0.411765	0.513514	0.4	0.277778
4	0.545455	0.378378	0.342857	1	0.4375	0.464286	0.441176	0.53125	0.5
5	0.5	0.425	0.432432	0.4375	1	0.424242	0.571429	0.486486	0.451613
6	0.485714	0.333333	0.411765	0.464286	0.424242	1	0.5625	0.470588	0.37931
7	0.578947	0.5	0.513514	0.441176	0.571429	0.5625	1	0.611111	0.411765
8	0.578947	0.463415	0.4	0.53125	0.486486	0.470588	0.611111	1	0.454545
9	0.428571	0.388889	0.277778	0.5	0.451613	0.37931	0.411765	0.454545	1

center of the relevant group. To overcome this problem in PCA, it is recommended to calculate the similarity or distance coefficient of two separate individuals only by using the attributes or variables that have full data for both individuals and remove the variables or attributes with missing data for one or both individuals from the calculation of the coefficient for those two individuals.

Principal component analysis can be employed as a method to determine the desirable number of clusters. The desirable number of clusters is the number by which the first PC in each cluster can justify the maximum changes, meaning that all individuals are initially regarded as a cluster and are then integrated so that in all the clusters formed, the changes justified by the second PC are less than the specified amount.

## Results and Discussion

In the research conducted by Rai et al. (2007) on the genetic relationships of *Amaranthus* from Caryophyllales family, ISSR and RAPD molecular markers were used. For ISSR, 18 primers were applied and for the RAPD, 15 primers were used. The similarity coefficient of ISSR was obtained to be 0.45 and its cophenetic coefficient was 0.83 and for the RAPD, the similarity coefficient was 0.47 and its cophenetic coefficient was estimated to be 0.83, which indicate the good fit between the similarity matrix and the dendrogram. Both dendrograms showed good similarity between species, suggesting that ISSR and RAPD act efficiently for determining the genetic relationships and are good tools for classification between species (Rai et al., 2007).

Yousefi and colleagues examined the genetic diversity of the herb "thyme" using the ISSR molecular marker. In this study, genetic diversity of 14 thyme ecotypes received from the Research Institute of Forests and Rangelands and belonging to different geographical regions of Iran was investigated using the ISSR marker. The seven primers selected for analysis produced almost 79 polymorphic bands (95/018%) out of the 83 bands that appeared. The highest number of formed polymorphic bands belonged to the UBC-786 primer. The used primers revealed a total of 83 bands within the range of 200-2600 base pairs and there were approximately 79 polymorphic bands. According to the cluster analysis using Jaccard's genetic similarity coefficient, ecotypes were divided into three distinct groups. Principal component analysis approved the results of the cluster analysis. The least genetic similarity was between ecotypes 13206 and 27814 and the greatest genetic similarity was between ecotypes 27800 with 27814.

Phylogenetic relationships of some word species were studied using the ISSR marker. The word is one of the important and economical ornamental plants in the world. ISSR markers were used to determine the phylogenetic relationships among 47 word genotypes. Of the 15 primers used in this research, 11 primers showed acceptable polymorphism. Totally, 193 fragments were added and

173 fragments among the species were polymorphic. The additive products were electrophoresed on 1.5% agarose gel. The similarity matrix was formed and the dendrogram of grouping the cultivars was drawn using Jaccard algorithm in NTSYS 2.02 software. In the obtained dendrogram, in the similarity coefficient, more than 52% of the species studied were divided into four groups (Jabbarzadeh et al., 2011).

## Conclusion

Minimum and maximum distances are different in various analyses. It seems that the analysis used as the basis for conclusion is the one that has similarity and overlap. Besides, based on our studies, it was found that the ISSR molecular marker has more efficiency than other markers.

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# Identifying and Assessing the Process Risks of Ammonia Refrigeration Room by Using the HAZOP Technique to Provide Solutions to Control and Reduce Accidents in the Food Industry

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## Abstract

Nowadays, safety and accident prevention play a vital role in all stages of a process or system life span. The discovery of hazards that lead to accidents and analysis of the process units risk can have a significant impact in reducing ammonia refrigeration accidents. In order to comprehensively plan in safety and reducing accidents, risk identification and hazards assessment should be the priority. Among the available methods, Hazard and Operability Study (HAZOP) popular technique is a powerful way to identify process risks and determine their effects on the system. In this study, the results of HAZOP and PHA-pro software have been provided as recommendations for increasing safety of this unit and reducing the risks of identified hazards.

**Key words:** HAZOP, ammonia, food industry, accidents

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## Introduction

Development, progress and spreading of highly complex and important technology in various industries, especially "process industries" have resulted in the philosophy of safety based on risk identification and the process of incident controlling has changed from after-the-incident approach to a new approach. Growing utilization of this new approach and reducing the number of accidents in the process industries reflects this processes' positive effect on reducing damage. Process industries are often associated with high risk chemicals and units operating under the parameters such as temperature, pressure, viscosity and so on. Therefore, the probability of incidents such as explosions, toxic spills and fires is high. Also, due to the large expansion, the high number of personnel, and a considerable amount of various chemical substances in severe operating conditions, this industrial sector has the potential to generate huge accidents in line with the number of casualties, the amount of damage and higher distance dimensions. Sometimes the occurrence of a major accident or explosion can cause irreparable damage with regard to the position of a plant and possibly the entire body of a specific industry.

A close examination of popular accidents proves that a large part of damage caused by them and their likelihood of occurrence were not only foreseeable but also they were preventable, provided that at least engineering safety analysis such as Consequence Modeling and quantitative risk assessments are done timely. Quantitative risk assessment of hazards such as releasing flammable and explosive chemicals into the environment is one of the most urgent and most important steps in increasing the level of safety in existing or designing process of units. In developed and developing countries, quantitative risk assessment is an integral part of process units design that unfortunately in our country still has not gained its place and perhaps one of the important reasons is the

lack of sufficient familiarity with the basic principles of risk assessment. Risk assessment is the most widely used method for the management of effective tools in safety of process units to reduce the risk of various accidents.

Temperature plays an important role in maintaining the quality of food products. Refrigeration in the food industry is necessary and inevitable. Ammonia is a toxic substance that is used as the refrigerant in most of the food industries' refrigeration rooms. Due to the process risks of ammonia refrigeration that may be caused by human error, equipment failure or other factors, the importance of the security in different parts of the existing units or those under design will be manifold.

In order to comprehensively plan in safety and reducing accidents, hazards identification and risk assessment should be the priority. Among the available known methods Hazard and Operability Study (HAZOP) technique is a powerful way to identify process risks and determine their effects on the system. In addition to detecting and determining the effects on the system, HAZOP is able to detect operational problems, which are also involved in the efficiency process.

With regard to the risks involved in ammonia refrigeration the need for using a systematic method for identifying hazards is required. In this study, while using the HAZOP techniques and use of PHA-pro software, we aimed to evaluate and identify hazards as a component addressed in ammonia compressor units, and recommendations should be provided to prevent potential accidents in order to maintain health and safety and reduce damage to equipment and the environment. In this study, the results of HAZOP and PHA-pro software are provided as recommendations for increasing safety of this unit and reducing the risks of identified hazards. Also scenario review of ammonia leakage and its consequences by software PHAST and utilization of obtained results has contributed to casualties and the reduction of ammonia leak harmful and developing an appropriate plan with regard to the emergency response.

### **HAZOP (Hazardous Operability) Technique**

This technique used for the first time in the 1970s based on the techniques called critical testing was introduced by the Great British monarchy chemical industry and then became legal on the recommendation of T. A. Kletz. Basically, the HAZOP technique that has a prospective and prevention nature was used as the reaction to the use of a retrospective method based on the philosophy of the checklist. Although the intended technique for the first time was introduced and used to identify and assess the process risks, today by introducing and demonstrating its capabilities, it has been extended to other systems and industries. HAZOP is a systematic and qualitative approach that is based on the use of key words. It is a creative way to solve problems with safety and operational roots, which is based on cross functional team activities.

### **HAZOP study goals**

The following objectives can be considered:

1. Identifying all the potential reasons in the field of the study that led to important safety and operational effects.
2. Decision making about this issue regarding current designs and to ensure that risk of known hazards are acceptable or not?
3. Achieving an acceptable level of risk.
4. Maximizing the value of the company's facilities by reducing processes risk with regard to an acceptable level and improvement of operational effectiveness.

### **Effective factors in success of HAZOP study**

In general, the success of studying HAZOP depends on several factors, some of which are:

- Team suitable composition.
- Experienced and participatory members.
- The existence of appropriate instructions that at least by job analysis will be provided and will be stated clearly and audibly.
- Team members' technical skills, knowledge and insight.
- Team members' ability to ally closer the team's thinking to distortions; receiving and understanding and strengthening the group imagination.

## **Findings**

For response plans preparation in emergencies, at first, data must be collected and organized. This information may include the needed elements to control and reduce the consequences of an accident and identifying them is important in terms of available power to control events and provide a proper design. These items are as follows:

- List of employees, contractors and visitors present in different parts of the workplace
- Required specifications to communicate with employees' families
- Available potential in place such as geology status and seismic imaging, the probability of floods and extreme weather changes, along with all the climate information that is reported by meteorologists.
- The epidemic cases, etc.

### **Response Team in emergencies and related duties**

Emergency Response Team has been considered for planning and performing specific actions in emergency situations and in emergency conditions. Everything depends on this team's performance, therefore, its organization and the type of functions are very important. In general, this collection of people and teams are:

1. Team management that can be the senior management of the organization, For better results it is also better to assign three successors for the management team who are responsible for planning and management in emergency situations.
2. The publicity team that includes people in different units and central offices, and activating the warning equipment, providing information for public and informing the firefighters and rescue teams and other operational units are the responsibility of this team.

3. The Operational Team which is responsible for the Emergency shutdown, rescuing people at risk and bringing them out from the environment, Search and Emergency rescue and monitoring the evacuation of all people with regard to the planning.

4. The technical team that is aware of system status, insurance, laws, security systems etc. and in this regard can provide the necessary information.

Response program in emergency situation is determined and driven through an office or central room (ERC); the tasks of this central unit are as follows:

- Establishing an ongoing relationship with the relevant operating unit, organizing and coordinating of all required support operations, for example evacuation and management of injured and dead bodies.
- Developing strategies and actions based on analysis of existing technological problems and the overall condition of the unit and spreading and worsening emergency situation.
- Gathering the necessary documentation that may later be interrogated, followed and claimed.

### The process of emergency response

To prepare emergency response, at first the process of reaction must be specified. This process is usually a systematic process and its general process is described as follows:

1. Activating the warning systems and informing
2. Informing the fire department (that is done through transferring the warning signals to fire stations by alarm systems that are installed in place and which in a fire or emergency phones that are connected directly to the fire department.)
3. The separation of the incident location (e.g. fire)
4. Evacuating the incident location
5. Gathering of people in a secure position and doing census
6. Rescue operations for injured people and search operations for missing persons
7. Harness the incident (e.g. fire extinguishing)

### Training and performing a variety of maneuvers

The last stage of the fire escape, is staff readiness in line with the accident; although a separate team is considered in the emergency response plan for each stage of work, but everyone in the team must have necessary training that this training is as follows:

1. How to use the informing and warning equipment
2. Types of first aid, especially artificial respiration
3. System emergency discharge procedures (ESD)
4. Evacuation procedures
5. Using personal protective equipment and supplies
6. The search and rescue methods in all circumstances
7. The method of inhibiting the incident (e.g. fire suppression methods on fire incident)

And ultimately the obligation and necessity for any person at particular places, especially eventful places such as places where process industries are present, is familiarity

with emergency evacuation procedures, functions related to emergencies and paying attention to the signs, alarms and warning systems.

Typically training can be done through the following levels:

1. Training in the early stages of system design
2. Training newcomers
3. Training during the new equipment installation and processes operation and working with new materials
4. Periodic training (e.g. once a year)
5. Advanced training

## Discussion

Risk assessment is a tool for a risk analyst manager whereby based on this tool a manager can prioritize the risk to identify the suitable areas in order to lower the risk. In order to identify the risks of a process and ensure the absence of some of the risks identification, HAZOP can be a good choice. Response planning in emergencies for each process or non-process system is a basic requirement but the prepared plan varies with the system size and the cost allocation. A suitable program can reduce the severity of accident damage, and minimize incident-related costs and support the organization's credibility but the main feature of a good plan, is not the complexity and the different trends in that decision is simplicity and practicality so here the maneuvers and testing the plan to ensure it works are very important. On the other hand in the development of emergency response plans the risk scenarios should be limited to enhance efficiency.

### Operational points in designing, manufacturing and elements of cooling systems (6985-1)

All parts of the refrigerant circuit must be designed and constructed in such a way that they are able to maintain no leakage state and resist pressure that can occur during the operation and in stoppage time and system transporting it should resist heat, and physical and chemical stresses. Safety and control devices should not be operated by unauthorized and irresponsible persons and should have been saved from intentional or unintentional use. Piping in the cooling system must be designed and installed in such a way that liquid knock (water hammering) cannot damage the system.

### Operational points in line with the cooling systems installation and launching

Discharge of the refrigerant to the atmosphere must be minimized. The discharge of refrigerant that is inevitable should be to that extent that cannot endanger human health. Guards, plumbing network and connections as far as possible should protect the cooling system against the harmful effects of atmospheric conditions and dust and junk.

### Operational points in the exploitation, maintenance, and personal protective equipment in cooling systems

In cooling systems exploitation guidelines, processes should be considered in the operation and providing service

for the system and for cases where there is a failure or leakage in the system warnings should be included that are installed in visible locations. Those responsible for the design, construction, installation, inspection, operation, maintenance, evaluating and disposal of all components, must be trained and have the technical knowledge required to be qualified for the duties.

#### **Protection of people in cold rooms (6985-1)**

To reduce the risks for the people locked inside the room, we must ensure that no person would be locked in cold storage at the end of the working day. In some cases it is possible that due to strong flow of outside cold air the door of the room will not be opened. According to operating conditions, these equipment and facilities for cold storage shall be provided with size greater than 10 cubic meters:

- a) A warning switch should be activated by a luminous push-button or a hanging chain near the floor of the cold storage room.
- b) Warning devices must be connected to a 12 volts electrical circuit.
- c) Light bulbs switch circuit in the refrigeration room should be parallel with the light switches outside the refrigeration room.
- d) Fan switch circuit or other devices that are used for this purpose in the refrigeration room should be in series with outside switches.
- e) Light bulbs switches must constantly have luminous buttons.
- f) In the case of a malfunction or failure of light bulbs, the paths that lead to emergency exits must be indicated by the independent light bulbs or by other approved means.
- g) Permanent emergency light bulbs.

Cooling systems should be equipped with all the necessary parts for repair, maintenance and testing.

#### **Pressure requirements and pressure vessels (6985-2)**

All parts of the cooling circuit according to the possible thermal, physical and chemical stress should be designed and produced for remaining leakage proof state and withstand the pressure that may occur during operation, interruption and displacement. Additional tension can arise due to gas beat. Pressure vessels must comply with the relevant national standards. Technical requirements for pressure equipment are provided in Iran National Standard EN10204. Abutments and pillars of pressure vessels should be designed and placed in a way that can resist static and dynamic forces. These forces may be shaped due to the tanks' mass, content and equipment' mass, snow load, wind load, support mass, braces and connecting pipes and displacement of pipes and components.

#### **Pipes**

All the cooling circuit pipes should comply with the relevant design, manufacture and installation standards that with respect to expected chemical, physical and thermal tensions remain leakage proof and resist against the pressures and temperatures that occur during the performance and handling of interruptions. Protective equipment, pipes and fittings should be kept off as much as possible the negative impacts of the environment.

Flexible tubular components should obey Iran National Standard EN173. These components should be protected against mechanical damage, tensional stress and other tensions. These components should be checked regularly and periodically. Misuse of pipes as a means of access should be prevented.

#### **Corrosion protection**

Pipes and steel components must be protected against corrosion by a stainless steel cover. This protection is essential, especially before operating any insulation. Corrosion protection can be performed according to standards associated with corrosion. Tubes and pipes that are used for connecting for measurement, control, safety devices should have suitable resistance proportional to the pressure and be installed in such a way to minimize vibration and corrosion.

#### **Valves and protective equipment**

Cooling systems should have suitable separator valves that minimize the risk of loss of refrigerant, particularly during repair or maintenance. Manual valves that are necessarily used in some circumstances should be equipped with a hand wheel or lever. Valves should not be used while the machine is working; they have to be designed to prevent operation by unauthorized persons. In case of emergency valves, these devices must be located near them and should be protected against improper use. Warhead Valves must be designed in a way that any refrigerant pressure that emerges under the cap can be discharged once the cap is open. The use of warheads valves always is preferable, except in places where the faucets are frequently used or should be used quickly because of an emergency condition.

#### **Protection of system components**

##### ***Protection of positive displacement compressors***

Positive displacement compressors with swept volume greater than 25 liters per second must be protected by means of pressure breaker in place of discharge. Non-positive displacement compressors do not need a pressure breaker, on the condition that the crossing is not possible for the maximum allowed pressure. Evacuating the pressuring to the lower pressure part leads to overheating of the compressor. Positive displacement compressors should have an output cut off device and compressors with swept volume more than 25 liters per second must be protected by a safety key for limiting the pressure.

##### ***Materials used in the cooling system***

The suitability of all materials that are in contact with the fluid must be proved by long-term practical tests and experiments. Copper in contact with refrigerants must be oxygen-free or deoxygenated. Copper and its alloys that have a high percentage of copper should not be used as part of an ammonia carrier. Aluminum and its alloys can be used everywhere in cooling circuit, provided that they have appropriate resistance and compatibility with refrigerants and lubricants. Magnesium and its alloys should not be used, unless they have already been proven to be compatible with the refrigerant. The outer layer of the

components can be covered by zinc. Zinc plating the parts is possible with the help of electricity. Soft alloys should not be used for soldering except for internal purposes. Brass alloys should not be used for welding. Tin and tin alloys will be abraded by halogenated refrigerants and they should not be used. Antimony and lead-free tin-copper alloys can be used for valve seat. Lead can be used for washers.

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# A New Perspective in Baboon Cardiac Xeno Transplantation

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## Abstract

End-stage heart failure is prevalent in the industrial world and there is a long waiting list for heart and other organs, yet the pool of donors are limited to less than 10% of all brain death cases coming out of traffic accidents. The National Highway Safety Administration of the United States reports that only 2,800 transplant organs were harvested out of a total of 56,000 road accident deaths in 2016. In China, it is expected to have a record number of transplants this year mainly harvested from executed prisoners, (world number two in execution after Iran), despite a new ban applied this year (South China Morning Post).

One of the most exciting potential donor pools which is also very close genetically to Human beings is the baboon, in which we will try to re-ignite interest in research and development for farming and harvesting of their organs for use in people in need of Xenotransplantation. The same has been done from pig farming.

There is also an opportunity to use them as a Xeno-bridging to all transplantation.

**Key words:** baboon, xenotransplant; Papio, concordant, discordant, Cyclosporine, total lymphoid irradiation

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## Introduction

Cardiac Xenotransplantation (Xeno-from Greek meaning "Foreign"), is the transplantation of living organs from one species to another (2).

With contrast to all transplantation (from another individual of the same species), they both offer a potential treatment for end-stage organ-failure which is prevalent in the industrial world. It also raises many novel medical, legal and ethical issues, especially harvesting from animals (3). Also a continuing concern is that many animals, such as the baboon, have a shorter lifespan than humans, meaning that their tissues age at a quicker rate (4).

An increasing shortage of transplant donor hearts currently results in an escalating number of preventable Human deaths.

At present 65% of patients on transplant waiting lists will not be able to receive a heart by the end of one year. 22 people die every day on the organ transplant waiting list (12).

It is a sad situation which could be alleviated by somehow increasing the pool of available donor hearts.

Xenocardiac transplantation, the use of animal hearts for transplantation for human beings is now and will be in near future the golden opportunity in developing countries with lesser rigid laws for animal protections. It may be medicine's most viable answer to the urgent and insurmountable human heart scarcity.

As we know, heart transplantation is a cultural phenomenon/a procedure engaging both physical and symbolic manipulation of human and non-human bodies, therefore transforming its corporeality, identity, and culture. Due to obscured issues of Cardiac Xenograft related to non-human animals namely chimpanzees and baboons and that could also be stressful to human heart recipients, revealing that the cardiac Xenograft may not be widely embraced, yet its culture could soon be changed, therefore providing a way forward for those in need of cardiac transplantation (5).

For pig-to primate xenotransplantation, a significant number of barriers have been identified and potential solutions generated, however, the survival rates remain modest at best with longest heterotopic heart transplant surviving only 99 days and the longest functioning orthotopic heart transplant surviving only 39 days (6).

In the late 20th century organ replacement surgery has been presented, both in medical texts and in media, as a miracle of modern medicine (Birke, 1996). Heart transplantation is one of medicine's most flamboyant symbols. The replacement of diseased vital organs with healthy cadaveric organs is now a routine therapy that not only extends life, "but also improves its quality and is not particularly expensive" as compared to L.VAD (Nuffield council on bioethics (NCB), 1996, P2).

For Biomedicine, the continuing success of heart replacement technologies is now hampered by deficits in "natural" resources: hearts available for transplantation. As each year passes, the shortfall in heart supply increases, resulting in unnecessary patient morbidity and mortality (Caplan, 1992; Calne, 1993; NCB, 1996). According to a report by the United States, National Highway Safety Administration, out of 55,000 road mortalities only 2,800 hearts were harvested and used for transplantation (National Procurement Agency, 2016, yearly report). Remaining rigidly unresponsive to alternatives, health education strategists [Bulletin of Medical Ethics] (BME), 1991; Caplan, 1992], or changes in the diagnosis of death (Ohnuki-Tierney, 1994; Singer, 1994), heart scarcity now constitutes one of medicine's fastest growing problems (Concas, 1994). The answer to the human heart shortage is now seen to lie in the resurrection of the Xenocardiac transplantation, a trans-species of which extensive animal farms can be established. The use of animal products and parts is already routine in human medicine. As yet unfamiliar, and more ambitious, is the proposal of whole organ, namely heart from healthy transgenic animals into humans with end-stage heart failure.

"Concordant xenotransplantation" means transplant between more genetically related species versus "Discordant xenotransplantation" which occurs between more distantly related species, were analyzed. At the turn of century the first cardiac Xenograft involved using heart from pigs, dogs, sheep, monkey and goat into Humans and took place in Europe.

The surgeons were unaware that such a diversity with distantly related species, would cause such a fierce rejection from recipient immune systems, that imminent massive graft failures were evident. So more closely related species such as chimpanzee and baboon (Papio Papio) with more genetic similarity with humans were selected with good results.

Chimpanzee, due to their protected semi-extinct status, were placed on protected list and were eliminated from the donor list. On the other hand, the baboon is considered by proponents a well breeding and overflous species in

nature and even produced commercially in some farms in subcontinent India for the purpose of export for research and development.

It is believed to be the future selection of scarcity of Xenocardiac transplantation. Guinea baboon from African continent (also called Savanna Baboon) has a life span of 35-45 years with a body mass of 15-40 kg. Their gestation period is about 6 months and the nursing period is also about 6 months. Their colony has about 200 individuals. They eat almost anything including small mammals. They are very communicative animals by using a variety of vocalization and physical interactions. This species also has used its vocal communications to be received and interpreted by predators.

### Animal Ethics and religion

One of the most vocal and strongest organization for animal rights is People for the Ethical Treatment of Animals (PETA).

They enjoy very strong and powerful support from every NGO.

They receive some funds and their members are willing to sacrifice on controversial issues to challenge it even at the level of physical altercations. The latest occurred in 2009, when a group of 50 individuals from PETA entered a section of research and development of Minnesota Mining and Manufacturing (3M) in St. Paul.

Now with this incident, that place has turned into a fortress rivaling place neighboring Fort Knox in Kentucky!

The PETA group have repeatedly stated that they are "opposed to the use of animals and animal tissues for experimentation, medical training, and clinical treatments (9). They are opposed to the idea of xenotransplantation because they maintain that humans do not have the right to breed and use other animals for their own needs. Religious views and organ transplant in Islam and Judaism forbid use of pig products (porcine), yet in dire situations when a human life might be saved, it allows exception.

Buddhists regard organ donation as a personal matter which should be left to an individual's conscience. A Hindu tenet is that the body must remain as a whole in order to pass into eternal life, therefore transplantation is not condemned except for the use of cows which are regarded as sacred, so a Hindu can donate or accept an organ without prohibition and can use animal organs to alleviate his sufferings.

Also it's notable that in Hindu Mythology, lord Ganesh (Lord's Shiva's son) received a xenograft from an elephant head after lord Shiva inadvertently severed his Son's head.

**Experimental Xeno Transplantation in Discordant Vs. Concordant Xenotransplantation:**

The idea of transplantation across discordant xenogenic barriers in an orthotopic newborn pig-to-juvenile baboon model was first explored at Loma Linda labs in California in early 1990's. Because of hyper-acute rejection as a first stage, it was important to eliminate or reduce Baboon's preformed xenoantibody by exposing them to Swine Sugar Antigens (8,9). Also by Matsumiya et al (10) splenectomy was omitted, and the baboon recipients were preoperatively immunosuppressed one month using Cyclosporine and Methotrexate. Total lymphoid Irradiation (TLI) was administered for one week.

All animals survived the transplantation procedure. Nearly complete adsorption of anti-pig xenoantibody was documented, and no sign of hyper acute rejection was observed. Delayed rejection occurred almost uniformly between post operative days 10 and 14. Rejection was successfully reversed in two animals using massive doses of methylprednisolone, but the two animals succumbed to exacerbation of delayed xenograft rejection at 19 and 24 days. Cellular infiltrates included macrophages and T-Cell Killers, suggestive that delayed discordant xenograft rejection occurs by mechanism other than classic allograft cellular or humeral pathways.

While the idea of xenograft as a bridge to cardiac allografting is still developing, the core decision on Human neonatal cross-species transplantation has slowed down due to lack of donors.

One of the important questions was whether the antibody response to the xenografted heart would develop and later would be cross reactive and cause reaction to the allografted heart. So sensitization of this nature might preclude successful secondary allotransplantation. This question was initially explored by Alonso de Begona(11), who employed a model in which African green monkey hearts were transplanted into the neck of five immunosuppressed Juvenile Baboons using a technique previously shown by the Columbia University Group (CUG).

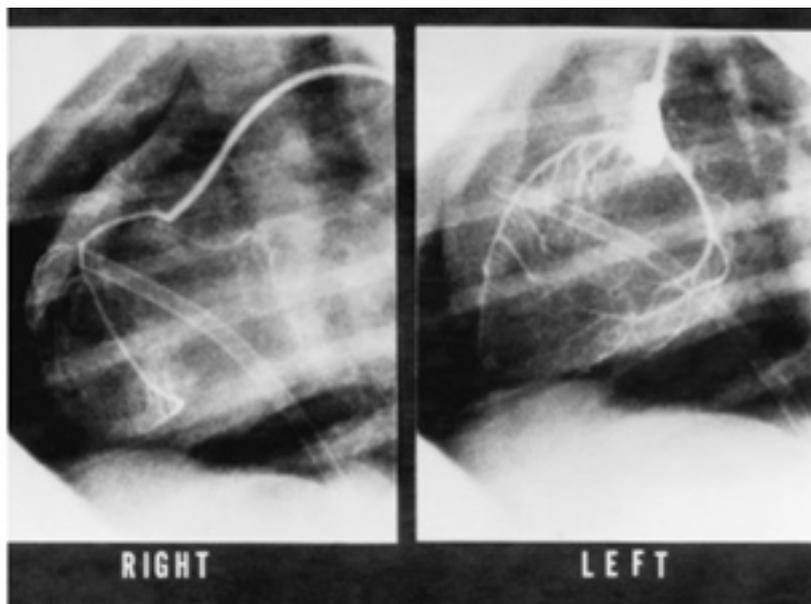
These grafts were rejected over a period of 5 to 65 days. Lymphotoxic Xenoantibody was identified in recipient blood samples. The rejected xenografts were removed, and the recipient circulating xenoantibody titers were observed to peak over 24 to 48 hours. Using cardiopulmonary bypass primed without blood, the immature Baboon recipients then underwent orthotopic cardiac allotransplantation. All survived the secondary heart allotransplant procedure without evidence of hyper acute, Antibody mediated rejection. They were immunosuppressed to varying degrees using a cyclosporine (CSA) protocol (Table 1) (Figures 1-5).(23)

**Table 1: Survival of xenografts and allografts and host therapy employed in a xenograft bridge to allograft model using an immature baboon recipient**

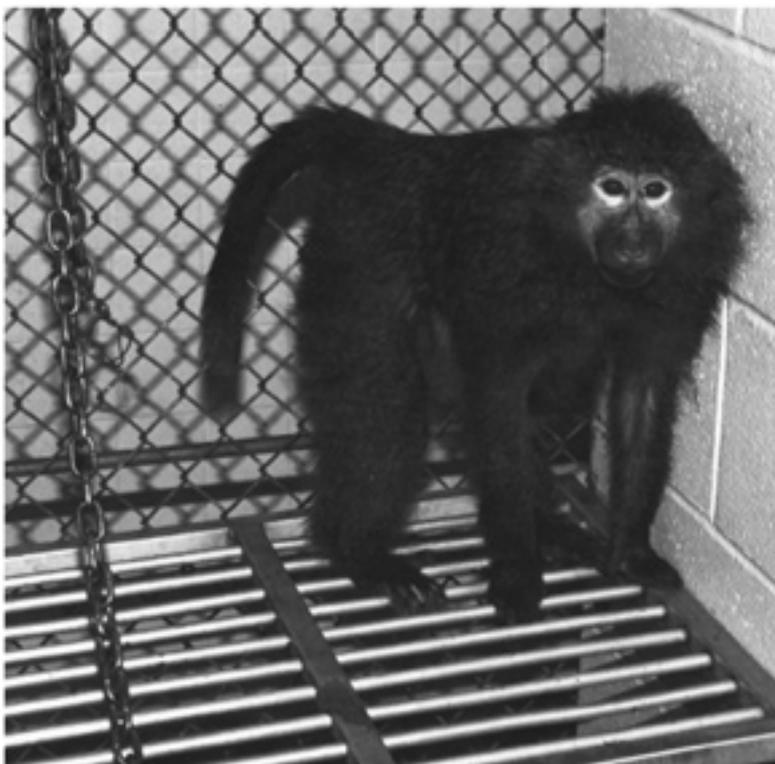
Experiment	Cardiac heterotopic xenograft (African green monkey)		Cardiac orthotopic allograft (Common olive baboon)		Allograft rejection
	Therapy <sup>a</sup>	Survival (days)	Therapy <sup>a</sup>	Survival (days)	
1	A	11	A	10	Severe
2	A	5	A; B <sup>rescue</sup>	58	Moderate to severe
3	A	6	A; B <sup>rescue</sup>	65	Moderate to severe
4	A; B+ C <sup>rescue</sup>	13	A; B+ C <sup>rescue</sup>	198 <sup>b</sup>	Non
5	A+B+C	65	A; B <sup>induction</sup>	164 <sup>b</sup>	None



**Fig. 1.** Max, an immature baboon recipient of an orthotopic cardiac xenotransplant acquired from a donor rhesus monkey. He was an active, growing, healthy baboon photographed 1 year after transplantation. He went on to live 502 days and died of cytomegalovirus disease. His xenograft was free of rejection, but coronary disease was in evidence at autopsy.



**Fig. 3.** Coronary arteriograms (CAG) obtained on routine evaluation of Max, an immature baboon recipient of a rhesus monkey heart orthotopically implanted 1 year prior to these contrast studies. Coronary arteries appear normal in size and distribution.



**Fig. 4.** Baboon recipient of orthotopic rhesus monkey cardiac xenotransplantation. This recipient lived 515 days on a maintenance immunosuppressive regimen of cyclosporine and methotrexate. The animal required treatment with methylprednisolone boluses for only two episodes of graft rejection. She grew and developed well. She ultimately died of right coronary artery obstruction and selective right ventricular fibrosis.



Fig. 5. Vigorous, healthy juvenile baboon recipient of orthotopically implanted piglet heart photographed 10 days after transplantation. She went on to live 16 days, dying suddenly of delayed xenograft rejection.

Recently researchers at the National Institute of Health (NIH) reported that they were able to have a pig's heart beating inside the abdomen of a baboon for more than 500 days (13).

Matsumiya et al (14-16) developed a similar species of six xenotransplanted baboons in which the concept of pre-transplant immune suppression was utilized and splenectomy was omitted. The cyclosporine and Methotrexate were administered comparable to Loma Linda University. Three recipients survived for a year with the longest for a total of 515 days.

Most morbidity and mortality were related to viral infection. By use of OKT3 for acute myocarditis (Ali Sadeghi et al) (17) the ejection fraction improved from 10-20% all the way to 50-70% (18, 19).

Again long term survival in 3 groups of baboon that underwent orthotopic concordant cardiac xenotransplantation of up to 300 days was reported by Asano, et al (20) for effects of immunosuppressive regimens with total irradiation of lymphoid tissues pre-transplant and use of cyclosporine, methotrexate, and antithymocyte globulin. This regimen leads to suppression of the interleukin2 pathway and xenoantibody production.

Dr. Smith reviewed the cardiac Xenotransplantation (21) which had an account of the immunological basis presented followed by an overview of approaches under study to overcome rejection and so he concluded that at present there are insufficient scientific data on which to base clinical cardiopulmonary xenotransplantation.

## Conclusion

There is an irony that investigators are trying to mimic an experimental procedure to cover up the sponsor's interest in clinical trials of cardiac xenotransplantation. The accusation lies in using "The guise of bridge-to-transplantation" to appear acceptable to institutional and peer's review or ethics boards.

From time to time, the FDA publishes guidance documents to assist sponsors and investigators interested in conducting clinical trials of cardiac xenotransplantation. Such final documents can be accessed on internet at <http://www.fda.gov/cber/guidelines>.

It is well known that xenotransplantation and its byproducts come under direct FDA regulations. In 1997, FDA formed xenotransplantation subcommittee of the BRMAC as an open discussion and ongoing mechanism for the scientific, medical, social, ethical and public health issues raised by specific ongoing and proposed protocols.

Some data from experimental labs at Loma Linda university and elsewhere indicate the momentum toward clinical xenotransplantation are both timely and justified. Federal Agencies are taking this work very seriously with plenty of research funds. Each proposal or protocol to initiate additional clinical trials of cardiac xenotransplantation will be reviewed by these agencies with an eye to scientific and benefits to public health and protection of experimental subjects. Keeping in mind the daily loss of human life due to lack of donor hearts and lack of any commercially

producing animal farms away from watchful eye of animal rights groups and institutional review boards and federal oversight agencies whose mandate is to first protect and ensure that patient and public benefit clearly outweigh the potential risks will surely justify and direct the necessary funds and resources to the bright future of these animal farms. Clearly a baboon with a mass of 40 to 50kg can be used as a donor heart for xenotransplantation of small human adults and definitely in pediatric transplant coming directly from a farmed baboon.

However, the use of cardiac xenografts solely as bridges to allotransplantation does not increase the donor pool; therefore, successful, permanent cardiac xenotransplantation must itself be viewed as the target of future clinical investigations so the pool of donor hearts would expand to the benefit of waiting needy patients. In the future, clinical heart xenotransplantation may accomplish its intended goal of achieving prolonged graft survival by diverting huge research funds and other resources by both public and private sectors. But we should be aware of the unintentional task of pressure groups namely the powerful animal rights groups to further hinder any scientific achievements by ignoring the need of that section of population in need of a new heart. We must remember that clinical transplantation is the only effective therapy for end-stage organ failure (22).

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# Mental Health in the Elderly and Its Predictive Factors

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## Abstract

**Background & Aim:** Estimation of mental health in elderly is an important issue in order to identify the physical and mental problems of such a critical period. The current study has been performed to address the elderly's mental health needs and then determine its predictive factors.

**Method & Materials:** This is a descriptive-analytical study with a sample size of 400 old people aged 60 years or over, chosen in a multi-stage cluster sampling from the five districts of Tehran. Instruments used for collecting data were questionnaires consisting of two parts: demographic and public health -28 GHQ. The data were analyzed via statistical tests, by using SPSS software (Ver.19).

**Results:** 65% of the elderly are in healthy condition, while 35% of them are suspected to have mental disorders. Variant tests revealed that there is a significant correlation between the elderly's mental health and their gender, education, coexistence type, job and suffering from chronic diseases ( $P < 0.001$ ). The results of the regression analysis indicated that adding one year to the age of the old people, significantly impairs their social functioning ( $P < 0.05$ ) and enhances the level of disorder up to 0.05.

**Conclusion:** With regard to the relation between the mental health and some predictive variables in this age group, it is suggested that the health-care administration pay more attention in educational programs toward the essential role of relative and predictive factors in improving the elderly's health. It would be a practical way to alleviate the prevalence and development of chronic mental and physical diseases.

**Key words:** mental health, the elderly, Tehran

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## Introduction

Mental health is considered as one of the triple dimensions of health. However, it is not a new concept; recently it has been surveyed technically (1). The World Health Organization (WHO) recognizes health as complete mental-social welfare, not only lacking disease. In fact, this concept involves complete physical and mental development as well as the abilities of a person (2). In addition to the importance of triple dimensions of health, the prevalence of contagious diseases and deaths induced by them, have caused physical health to be prioritized in most countries. The findings of previous research represents the importance of mental health is undeniable and as awareness and knowledge increase in this regard, the society may undergo less cost in different economical-curative dimensions and moreover, for the person who passes through this period with further enjoyment (3). The elderly are subject to increasing threats, generally due to retirement, loneliness, rejection, and also stress induced by industrial societies, which finally leads to the emotional and mental isolation (4). In this regard, Nejati (2009) reported in his research, which was performed on the elderly living in Qom city, that 48% of old people suffer from depression, 86% of them experience sleep disruption, 9% have disruption in social performance and 87% of the aged have disruption in physical performance (5).

The number of elderly is increasing by the day and it is predicted that their population will triple over the 50 next years. In such a situation, if the elderly have lower mental health status, and its side effects such as economic activity at a low rate (or zero) and high costs of health care imposed on society and individuals, then it can be regarded as a threat. Therefore, the promotion of elderly's mental health in addition to being a goal to improve the level of public health on one hand, would help economic stability on the other (6).

Being informed of the old people's mental health can assist to achieve their real requirements and also assist the planners to make plans in accordance with their needs (7).

The importance of the present study is out of respect to the importance of mental health issues in the elderly, and its inevitable role in the quality of their lives, as well as the growth of their population. In fact, the researchers believe that by understanding the mental health of elderly and its predictive factors, their general health of them is better provided for via the correct programs.

## Method

The present research is a descriptive-analytical research, and all the aged people living in Tehran and lacking cognitive disorders constitute the research society.

With the supposition that 50% of aged people have desired mental health, the sample size was estimated at 200, and by considering clustered sampling, this number was raised to 400 people.

The sampling was randomly performed in a multistage clustering classification method. Firstly, all of the districts in Tehran were divided into five zones (north, south, east, west, and center). Then a specific region was picked randomly from each zone and based on aged population of each region, their municipality statistics were recorded, and regarding the proportion of the elderly, the sample size was estimated in every region. After that, a health-care center was marked as head-cluster in each region. The health-care staff were taught the way of communicating with samples and also filling out the questionnaires in an educational session, and then they delivered the questionnaires to the elderly with scores more than 7 in the AMT test. The literate samples filled out the questionnaires by themselves, and questionnaires were filled out by interviewers for the illiterate. In the case that the person was not qualified to be involved in the study based on random sampling, the sampling was done for the next family.

All the information was collected by using demographic information questionnaire (including age, gender, marital status, job, dwelling, coexistence state, suffering from chronic disease and education) and GHQ-28 general health questionnaire which is a multiple test for evaluation of mental health (8). This questionnaire was designed by Goldenberg et al. (1979) and includes 28 questions and 4 micro-scales including physical signs, anxiety, social performance disorder and also depression. Different studies have proven the high reliability and validity of this questionnaire for the Iranian people (9, 10).

After scoring the questions, health classification was performed by setting a breakpoint at 23 points. Then the elderly were divided into two groups namely healthy (under 23) and suspected psychological disorders (24 and higher), in a way that higher scores indicated less psychological health (9). The participants were aware of the study's purposes, and personal satisfaction was obtained by taking part in the study. In addition, they were assured that personal information will be used only for research purposes.

Finally, the information was analyzed by SPSS software (Ver.19), and using the methods of statistical- descriptive, one-way variance analysis, independent T-test and multi-factorial linear regression.

## Results

400 old people (over 60 years) who were living in Tehran participated in this research and men comprised about 44% of the entire sample (176 samples). Most of the elderly (62%) were in a range of 60 through to 70 years old. The average age of men was  $68.61 \pm 6.71$  and it was  $66.98 \pm 8.22$  for women. From all the participants who answered the questions, 322 cases (84.3%) had health insurance, while 60 people (15%) lacked any form of health insurance coverage. 38% of participants had original insurance, 38% of them had complementary insurance, 3% of the old

**Table 1. General characteristics of participants in the current study and the average score of mental health and its subscales by separating their demographic variables**

Variant	division	Number (percent)	anxiety	depression	Disorder in social performance	Disorder in physical performance	Total mental health	
			average	average	average	average	average	p-value
Gender	Man	176 (44)	7.52	4.65	3.80	3.40	19.38	<0.001
	woman	224 (56)	8.46	6.35	4.47	4.48	23.77	
Married life	married	336 (85.3)	7.98	5.58	4.18	3.86	21.51	<0.001
	single	58 (14.7)	8.80	6.13	4.30	4.85	24.07	
Education	Illiterate	61 (15.3)	11.84	10.02	5.38	5.66	32.89	<0.001
	Just can read and write	55 (13.8)	7.44	5.54	4.88	3.68	21.54	
	Elementary	50 (12.5)	9.06	5.40	3.70	5.00	23.16	
	High school education	30 (7.5)	9	4.88	3.54	4	21.42	
	Diploma	16 (29)	6.41	4.59	3.86	3.60	18.47	
	University education	88 (22)	7.14	4.37	3.86	3.02	18.29	
Employment	Government job	18 (4.6)	5.72	3.94	3.83	2.89	16.39	<0.001
	Employer	53 (13.5)	8.02	3.81	2.81	4	18.44	
	Business	146 (37.2)	8.87	6.93	4.75	4.42	25.17	
	Housekeeper	14 (3.6)	9.08	5.92	4.77	5.62	25.38	
	Unemployed	25 (6.4)	10.16	8.64	4.72	4.16	27.68	
	Pensioner	119 (30.4)	7.61	4.57	4.29	3.42	19.89	
	Voluntary job	17 (4.3)	3.18	4.59	2.24	2.88	12.88	
Life accompanies	Alone	56 (14.3)	12.54	9.50	5.41	5.44	32.89	<0.001
	With spouse	177 (45.3)	7.06	4.76	3.70	3.72	19.24	
	With spouse and offspring	72 (18.4)	7.16	4.13	3.71	3.46	18.46	
	With single offspring	67 (17.1)	7.64	5.19	4.29	3.77	20.98	
	With married offspring	17 (4.3)	8.88	9.50	6.44	5.56	30.38	
Living location	District 2 of Tehran	66 (17.5)	9.02	6.45	3.86	3.94	23.27	0.126
	District 5 of Tehran	59 (15.6)	7.14	4.54	3.86	3.78	19.32	
	District 6 of Tehran	106 (28.1)	7.54	5.26	4.10	3.63	20.54	
	District 8 of Tehran	88 (23.3)	8.34	5.92	4.47	4.36	23.09	
	District 19 of Tehran	58 (15.3)	8.36	5.84	4.53	4.43	23.17	
Suffering from chronic diseases	Not suffering from chronic disease	316 (81.09)	6.24	3.36	4.43	2.76	15.79	<0.001
	At least suffering from one chronic disease	70 (18.1)	8.52	6.15	4.38	4.33	23.39	

**Table 2. The frequency distribution of mental health scores and its subscales in studied units**

Subscales	Average	Deviation criteria
Anxiety	8.04	4.26
Depression	5.60	4.50
Disorder in social performance	4.17	2.23
Disorder in physical performance	4.00	2.17
Total mental health	21.82	11.37

**Table 3. The relationship between mental health and its subscales with independent variables in multi-factorial linear regression in studied units**

Predicting factor	level	B	Dependent variant	Predicting factor	level	β	Dependent variant
Age	-	0.05***	disorder in social performance	businessman	housekeeper	-1.64***	disorder in social performance
Being woman	man	0.85***	disorder in physical performance	unemployment	housekeeper	1.82**	disorder in physical performance
Singleness	married	1.29***	disorder in physical performance	Receiving pension	housekeeper	2.44*** 5.79**	depression general health
Illiteracy	Diploma	2.08***	Anxiety	Living in District 2 of Tehran	District 6 of Tehran	1.11***	anxiety
		2.29***	Depression				
		1.83***	Disorder in physical performance	Living in District 8 of Tehran	District 6 of Tehran	0.67***	disorder in physical performance
		6.88***	Total mental health	Suffering from chronic disease	Not suffering from chronic disease	-1.14***	depression
						-4.01***	disorder in physical performance
-1.29***	general health						
Living lonely	Living with spouse	3.08***	Anxiety	Having Imam Khomeini Committee insurance	Original insurance	5.99***	anxiety
		3.08***	Depression			4.85***	depression
		1.19***	Disorder in social performance			3.65***	disorder social performance
						2.62**	disorder in physical performance
						17.15***	general health
Living with married offspring	Living with spouse	2.89***	Depression	Not having therapeutic insurance	Original insurance	1.40***	disorder in physical performance
		1.43***	Disorder in social performance				

\* p<0.05- \*\* p<0.01- \*\*\* p<0.001

people had self-employed insurance and about 1% of this population had Imam Khomeini commission insurance. The other general characteristics of participants and also the average score of mental health and its sub-scales are shown in Table 1, disaggregated by demographic factors. Further, the average scores of mental health can be seen in Table 2, by separating its sub-scales.

Based on the breakpoint (i.e. 23) for GHQ-28, among 377 people who answered the mental health questionnaire, 245 of them (65%) were in a healthy condition and 132 of them (35%) were suspected to have mental disorders. After carrying out 2-variant tests, significant and independent variables were embedded into a multi-factorial linear regression model and then analyzed. The related results are presented in Table 3.

## Discussion

According to the findings of the current research, the majority of the elderly living in Tehran were in acceptable mental health. Such results are in accordance with the study of Yazdani (2010) in Tehran, the study of Barati et al. (2012) in Hamedan, and research of Nejati (2009) in Qom (5, 11 and 12). Average score of mental health in the studied elderly was less than the breakpoint which was 23 (desirable level of health) and it is not in compliance with the results of Khomarnia and Baghbanian (2013) and Pasha et al.'s research (2007) (10, 13). In the study of Khomarnia and Baghbanian (2013), which was carried out in urban and rural areas in Zahedan, the mental health was reported in a low level within two societies and the researchers categorized the reduction of elderly's health to the low quality of health services and not paying enough attention to their health, particularly in rural areas (13).

In addition, this study revealed that 35% of the studied old people are suspected of mental disorders and are not in an acceptable level of mental health. Therefore, caring about the elderly's social position and health should be a top priority. In this lifetime, it is proved that firstly helplessness feeling, then aging feeling and wasting time have a substantial role in raising physical complaints, anxiety, sleeplessness, insufficiency in social performance and also depression in this group (14). Pasha et al. (2007) have reported in their study done on the elderly of Ahwaz city that the average score of their mental health is 16 (10), and this value is less than the mean of the present study and it shows that the old people of this city have relatively better mental health.

The obtained results based on subscales of mental health indicated a high score of anxiety in the present study compared to the other similar papers (11, 15). Such differences may be due to the growth of anxiety level in Tehran, specifically in recent years. Moreover, the findings showed that the average score of social performance in this research is less than two other items of research (less social performance indicates better condition) and it represents better social performance of the elderly in Tehran, especially in recent years.

The results of this paper indicate that the score of mental health in old women, as a whole and in all subscales, is more than the old men. In other words, women have less mental health than the men (higher scores indicate lower performance).

The distinction between men and women's mental health was significant in all subscales of anxiety ( $P=0.03$ ), depression ( $P<0.001$ ), social performance ( $P=0.004$ ) and physical performance ( $P<0.001$ ), which is in compliance with the findings of Barati et al. (2012), Tanaka et al. (2011), Habibi Sola (2007) and Khomarnia and Baghbanian's research (2013) (12, 13, 16, 17). This can be attributed to the structural factors of society as well as the role and social bases of men within society. Therefore, they feel more self-sufficiency and it helps their mental health improvement. The other reason for such difference can be found in personal improvement, their capacity in communicating with others and also their ability to overcome the problems and daily pressures.

The studies have proved that the accurate meeting of needs and more safety in society for men cause them to develop better mental health. To confirm this matter, Mortazavi et al. (2012) asserted that the old women are more depressed than the old men, and this can be related to the more sensitivity of women against daily problems of life and also having more responsibilities in the family (18). According to Sheikh Al-Islami et al. (2011), women experience more loneliness compared to men, and the results of the studies showed that there is a significant relationship between loneliness feeling and mental health of the elderly (19).

The variable of gender has an increasing effect on stress, anxiety and depression of the old people, in a way that old women are depressed and anxious 1.7 times more than the old men (20). Tanaka et al. (2011) asserted in their study that there is a difference between the depression of men and women (16).

In the study of Momeni and Karimi (2010) as well as Sohrabi et al. (2008), there was a significant difference only in social performance of women and men. In this case, the men had better status than women but there was no significant difference between them in terms of depression signs, physical performance and anxiety (15, 21). By considering that both men and women live in the health centers, the author believes that the equality between the signs of depression and anxiety for both groups can be the result of stressful and anxiousness (21). The previous results of regression analysis in our research showed that gender is a predictive factor in physical performance, so that being woman increases physical performance around 0.85% and this negative relationship is statistically significant ( $P<0.001$ ).

The results of this research showed however that the average score of mental health in married adults was less than single ones (i.e. they had better mental health); this difference was not significant ( $P=0.14$ ). The mental health

had a considerable difference between two genders in the study of Barati et al. (2012) and married adults had better mental health. They categorized its reason to the loneliness and depression of singles more than the married (12). In the study of Alizadeh (2008), there was a significant relationship between marital status with anxiety and depression, and the results showed that the married elderly lived in a superior position than the single in this regard. Similarly, in the study of Heidari et al. (2013) performed in Qom, married adults had been living in a relatively higher suitable status and this was due to the loneliness and depression in single adults (23). By comparison the married variable with mental health subscales of this research, findings represented that being married had only a substantial relationship with subscales of physical performance ( $P=0.002$ ).

The results of the present research showed that education is an effective factor in the mental health of the elderly, in a way that there was a considerable difference between the score of mental health between literate and illiterate cases ( $P<0.001$ ). Moreover, there was a significant correlation between education and all subscales ( $P<0.001$ ). This issue has been confirmed in the survey of Saberian et al. (2009) and also Barati et al. (2012) (7, 12). It may be the consequence of spending free-time with more various entertainments in old age, and furthermore, having an enjoyable life among literate adults (22).

Shankar et al. (2010) found out that there is a positive relationship between education and the health of the elderly. It means that in order to achieve and interpret the information, the ability of the individuals has been promoted by virtue of creating a personal control feeling, wisdom and knowledge, and consequently it may lead to improvement in their mental health (24). The results of the regression analysis exhibited that literacy in the form of reading and writing can add 6.88 and 3.45 points to the score of mental health, respectively. It is predicted that there is a significant correlation between illiteracy and anxiety, depression, and physical performance.

There was a meaningful difference between coexistence and the mental health score in all subscales, so that the average scores of the mental health for the elderly who live alone, is higher than those people who get along with their family.

These results are in accordance with other studies such as Pasha et al. (2007), Barati et al. (2012) and Heidari et al. (2013) (10,12,23). Alamdarloo et al. (2009) concluded that loneliness has a considerable relationship with depression and performance deficiency, and confirmed that loneliness is a cognitive factor in various individuals, and also has long term effects on health (25). In the present study, the highest anxiety is related to the elderly living with their married children, while the lowest anxiety is attributed to the elderly living with their spouse.

According to the results of regression analysis (Table 3), it is predicted that if the elderly who are living with their spouse become alone, their general health score can increase

up to 8.54 numbers (higher score means lower mental health). This effect is statistically significant ( $P<0.001$ ) and is extended among other subscales such as depression, anxiety and disruption in social performance ( $P<0.01$ ). The studies have showed that men mainly consider their wives as a source of support. The results of the current study indicate that the elderly who are living with their spouse or single offspring, are in a desired mental health. This may be due to the influence of living together which enables them to overcome their disability as well as mental and physical dysfunction, in a better way.

This survey has shown that there is a meaningful relationship between the scores of mental health and job. Furthermore, it is pointed out in the present survey that the old people who are independent economically, have relatively better mental health.

These results are in agreement with the research of Barati et al. (2012), Heidari et al. (2013) and Aihara et al. (2011) (12,23,26). Heidari et al. (2013) asserted in their study that being in a suitable economical position and having enough money are essential factors in order to have a quality life, not only for covering the fundamental needs of life but also as a key factor for taking part in social activities and enjoying from entertainments and holidays.

The elderly with relatively low economic conditions suffer from more chronic diseases and their side-effects, and this may affect physical and social performance (23). In this regard, the present study indicated that the elderly with a volunteer job, are in the best condition of mental health among other working groups. Moreover, the average of mental health score was in a desirable level among the self-employed elderly as well as those with governmental jobs or even pensions. However, this score was at an undesirable level among the old ones who were unemployed or housekeeper.

Regarding the regression analysis (Table 3), volunteer opportunity for the elderly is a predictive factor in reduction of anxiety ( $P<0.001$ ) up to 3.37 scores. Based on the results, if an old person with a housekeeping job follows a business, her social performance would be promoted significantly ( $P<0.001$ ) by 1.64. Also regarding the results of this study, it is determined that there is a meaningful relationship between the scores of mental health (and all its subscales) with suffering from chronic disease ( $P<0.001$ ). This conclusion is in agreement with the studies of Alizadeh (2008) and Mortazavi et al. (2012) (18, 22). The findings of multi-factorial regression revealed that suffering from chronic disease can raise the mental health about 4.01 scores and therefore it makes mental health weaker.

Disease can disrupt health. In higher ages, disability would become clearer and show itself with reduction of physical activity and also limitations in movements. There are more possibilities to suffer from chronic disease, and they can decline the health level and increase depression and anxiety (27). Regression test exhibited that the lack of suffering from chronic disease is a predictive factor for depression ( $P<0.001$ ), physical performance ( $P<0.001$ )

physical performance ( $P<0.001$ ) and general health ( $P<0.001$ ) in the elderly.

Other interpretations from this study indicate that there is a significant correlation between the age of the elderly with social performance ( $P<0.05$ ), in a way that as an old person gets one year older, disruption in social performance increases 0.05 score. The housing situation is also able to be a predictor of mental health in elderly people, in such a way that if an old person who lives in their own house, lives with relatives or children, their mental health would increase by 14.57 and 16.2, respectively and as a result the old person would have weaker mental health. In this case, the anxiety level would significantly increase 7.82 and 8.05 scores in the two above conditions, respectively ( $P<0.001$ ) and disruption in social performance would enhance 2.90 and 2.57 scores in a meaningful way ( $P<0.01$ ). The results showed that living in the house of offspring significantly increases depression by about 6.25 scores ( $P<0.001$ ). Based on such results it can be claimed that nowadays, living in the house of children or relatives, would be a predictor of weaker mental health in the elderly by considering the negative effect on anxiety, depression and their social performance.

The other results of regression analysis represented that moving into a new place could not be a predictive factor in the general mental health of the elderly. In some cases only changing the place of living in Tehran had a relationship with the subscales of mental health so that living in district 2 increased significantly the anxiety about 1.11 compared to the base district of 6 ( $P<0.05$ ). Another statistically significant difference ( $P<0.001$ ) raising about 0.67 score in disorder of physical performance within district 8, compared to the base district (district 6).

Another outcome of regression analysis suggested that lack of any therapeutic insurance significantly increases disorder in physical performance ( $P<0.001$ ). It was predicted that mental health would increase 17.15 scores for the elderly with Imam Khomeini Committee insurance and consequently, their mental health would be in an undesirable condition ( $P<0.001$ ). Having Imam Khomeini Committee insurance had a considerable relationship ( $P<0.05$ ) with increasing in anxiety, depression and physical and social dysfunction. These results indicate that the elderly with Imam Khomeini Committee insurance are not in suitable mental health.

This study has some limitations. The mental and physical health of the elderly affected their answering the questions in filling out the questionnaire, and this matter could not be controlled. In addition, some old people being illiterate (about 15%) caused a delay in filling out the questionnaire by the examiner.

According to the results of the present study, 35% of the aged people in Tehran are not in a desired condition in terms of mental health, so it is highly recommended to care more about the social and health condition of the elderly in this city. Furthermore, based on the relationship between mental health and some predictive factors in aged

people it is suggested that the essential role of relative and predictive factors in educational programs to be considered in health planning and management, in order to decrease the prevalence and growth of chronic physical and mental diseases.

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