Motivational Interviewing as Group Therapy for Glycemic Control and Treatment Satisfaction of Patients with Type 2 Diabetes Mellitus

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Abstract

Introduction: Diabetes Mellitus is the most prevalent metabolic disorder with considerable long term complications. Management of diabetic patients needs cooperation of a multidisciplinary team including a variety of specialties. Cooperation, motivation, enthusiasm as well as self-discipline, compliance, and satisfaction of the patients are necessary factors for the successful management of the disease. One of the proposed treatment modalities for better compliance and favorable outcomes for patients with chronic health problems, such as diabetes, is motivational interviewing.

Materials and Methods: In this research we have aimed at studying the effectiveness of group motivational interviewing among type 2 diabetic patients. We wanted to know whether it can be effective on glycemic control as well as the patient's satisfaction.

Thirty patients with a diagnosis of type 2 diabetes were randomly selected and divided into two matched equal case and control groups, each one including 15 patients. The intervention was four weekly sessions of group motivational interviewing. Each session was 90 minutes. Our assessments were lab tests including fasting blood glucose and glycosylated hemoglobin (A1C), as well as diabetes treatment satisfaction questionnaire (DTSQ). These assessments were done on both groups, three times including pre-test (one week before the first session), post-test (a week after the last session), and follow-up (two months after post-test). In order to assess the patients' attitude towards motivational interviewing, our case group also completed the client satisfaction questionnaire (CSQ) after the final session of motivational interviewing.

Results: A1C was decreased significantly in the post-test in the study group and it had been maintained in follow up (P= 0.0001). This decrease had a mean of 1.23 units. Treatment satisfaction increased significantly (P= 0.014). These changes were not seen in the control group.

Conclusion: Our findings showed that motivational interviewing as a group therapy was effective in glycemic control as well as treatment satisfaction of type 2 diabetes patients.

Key words: Diabetes Mellitus, patient's satisfaction, motivational interviewing, glycemic control.

Introduction

Diabetes mellitus type 2 (DM) is a heterogeneous group of metabolic disorders characterized by varying degrees of insulin resistance, impaired insulin secretion, and increased glucose production. People with type 2 diabetes constitute about 90% of diabetic patients [1]. DM is a leading cause of morbidity and mortality. Its common complications include increased overall heart diseases, stroke, hypertension, renal failure, foot ulceration and/or infection, and visual problems [2]. Psychological consequences of diabetes can be anxiety, stress, depression, interpersonal and interfamilial problems, sexual dysfunction, and poor perception of health [3]. Although medications are the main tools for the treatment of diabetes, psychological factors are known to affect the disease progress, glycemic control, treatment satisfaction, compliance and generally its outcome [4-5]. Also psychological interventions have been shown capable of improving different aspects of illness perception and patients' compliance [6-7]. Cognitive-behavioral interventions have proved effective on glycemic control as well as relieving emotional problems including depression, anxiety, and stress in patients with type 2 diabetes [8]. Since psychotherapy can reduce the need for costly medical services and increase patients' mental health during the course of treatment of chronic medical diseases, it is important to use it in these conditions including diabetes [9]. Diabetes can be effectively treated when the patient is recognized as a member of the treatment team, not the one being treated. This requires patients' motivation and active participation in the managing of their own disease. Motivational interviewing can be a potential approach for this goal. Motivation has been shown as an important variable in metabolic disorders [10]. Motivational interviewing (MI) refers to a client-centered and directive approach which makes changes possible by strengthening the person's own motivation for and commitment to change [11]. Motivational interviewing was used to treat alcoholism in 1983. MI also has been shown effective in medical disorders, especially chronic diseases since 1990.

In a recently published study health care professionals who used MI considered it as the most important way to promote patient compliance and build empathy in the patient-doctor relationship [12].

Its effect on better patient-doctor relationship and treatment adherence has been confirmed in a number of chronic medical conditions including diabetes [13]. In some pediatric chronic conditions not only the child's own motivation is important but also the parents' motivation is important for treatment engagement and success [14]. MI can be "blended with other evidence-based clinical skills and approaches" [11]. MI has been shown effective even in a brief 20 minute single session [15]. A two year study using MI as a group work for patients with type 2 diabetes has shown significant benefit when blended with medical/nutrition therapy [16]. In a study among older adults study investigators evaluated the effectiveness of training diabetes self-management through MI to improve glycemic control in adults with a mean age of 64.9 years. A total of 66 diabetic patients participated in the MI intervention through video calls for 6 months, and the control group received video calls for healthy lifestyle education. Although A1C was reduced in both groups, the reduction was significant only in the experimental group. The experimental group also showed a significant increase in diabetes knowledge and self-efficacy [17]. A preliminary study was conducted among 26 Native Americans to evaluate the effectiveness of MI on improving the management of type 2 diabetes. The intervention was performed in two 30-minute sessions of individual MI, which led to a significant improvement in depression self-report symptoms, treatment satisfaction, and social-occupational concerns. A significant difference was observed in A1C levels among patients comparing before and after the intervention [18].

Another study showed that MI was effective in improving the illness perception, patients' role in management of type 2 diabetes and prevention of its complications, and these effects were sustained over a one-year follow-up [19]. Studies have shown that MI can improve readiness to change [20], systolic hypertension, depression, and self-care among patients with type 2 diabetes [21] and even for diabetes control among the patients hospitalized for cancer [22]. Although most studies have emphasized the positive effects of MI on diabetes [23], some studies have failed to show the effectiveness of this intervention for diabetic patients [24,25].

Group motivational interviewing has been applied in practice in recent years [26] and its effectiveness has been proven with a variety of medical diseases [27]. In most studies, MI has often been used in combination with other conventional clinical interventions and it has rarely been used a separate intervention [28]. Furthermore, those studies that employed MI alone mostly focused on drug abuse [29]. However, studies employing group MI have reported similar effects for both group and individual motivational interviewing [30]. In 2010, a study was conducted to compare the effects of group motivational interviewing and cognitive-behavioral group training (CBGT) on improving physical health outcomes in adults with type 2 diabetes. The participants in this study were randomly divided into MI, CBGT, and control groups. Each of the interventions included four 90-minute group sessions. The results showed a significant decrease in body mass index of the motivational interviewing and cognitive-behavioral group training compared with the control group. The MI group had a greater reduction in the mean A1C compared to the CBGT group as well [31]. Because of the difficulties of designing, conducting and assessing studies on group therapy, such studies are much less frequently used when comparing individual therapies [32]. In general it has been shown that in diabetes the MI approach changes the perception of uncertainty, supports independence, and increases personal ability, enhances the readiness and commitment to change, and improves patient participation in treatment. MI groups can also help patients in identifying their own problems [33].

Materials and Methods

1. Participants

Eligible participants were selected through convenience sampling and randomly divided into experimental and control groups. A total of 30 patients with type 2 diabetes were selected from among the patients diagnosed with diabetes by an endocrinologist or internist based on medical history, clinical examination, diagnostic criteria for diabetes, and the latest examinations and lab tests. Inclusion criteria were as follows: age between 30 to 60 years old (practically all our participants were over 40 years old as most people with diabetes are between the ages of 40 and 59 years, across the world), having at least high school diploma, voluntary participation in the study and giving informed written consent, a diagnosis of type 2 diabetes based on the American Diabetes Association diagnostic criteria by an endocrinologist or internist, taking oral diabetes medications, and serum levels of A1C equal to or higher than 7. The participants included 16 women and 14 men. They were randomly divided into an experimental and a control group of 15 people in each.

Participants from both groups completed the Diabetes Treatment Satisfaction Questionnaire (DTSQ) and had the A1C test. The groups were matched for age, sex, education, duration of disease, marital status, and the A1C level. Exclusion criteria were psychotic disorders and other severe mental disorders, and/or severe cognitive dysfunction. People with gestational diabetes were not included in the study.

2. Intervention

Group motivational interviewing was the intervention used in the experimental group in this study. This intervention was performed by a psychiatrist (SM) as the group facilitator and a clinical psychologist as the co-facilitator in four weekly sessions. Each session lasted for 90 minutes. We used the protocol published (2015) by William Miller and Mark Steinberg in their book titled Motivational Interviewing in Diabetes Care for group therapy [34]. The presence of a co-facilitator with different skills and styles made it possible to have both better interpersonal dynamics of relationship between group members per se, and between them and the facilitators. Although motivational interviewing is designed mainly as an individual counseling approach, running it in group format makes it possible for each member to provide support for others to change. It also made group management easier.

The first session was considered as the orientation and engagement session for the group. Facilitators explained the group process as well as three main guidelines (rules) of the group which were confidentiality and positive/supportive feedback, and fair time sharing. In this session facilitators focused on facilitating group development and helping the group to build their optimal effectiveness. The primary task within the first session is to engage every participant and to establish an environment of trust and cooperation. Facilitators tried to involve group members to work together in order to make positive changes in their lifestyle. We started with simple "ice breaker" open ended questions about what the group members wanted to know more about diabetes and what they have done already for its management. Reflective listening was used by the facilitators in responding to build relationship and convey empathy. Following introductions, the discussion expanded to eliciting each member's hopes and expectations regarding their diabetes control and their experience in the motivational interviewing group. The main skills for this session were asking and listening.

The second session used an agenda mapping technique to help focus the discussion and enhance partnership within the group. Members shared ongoing achievements in managing their diabetes, their perspectives about their health, the impact of diabetes on their lives and core values. As a visual aid we drew a bubble sheet on a white board for a better understanding of the participants' concerns and agenda mapping. Facilitators listened for opportunities to affirm each person's strengths and values, and reinforcing positive attitude and activity for change (recognized as change talk within motivational interviewing). Evoking motivation of the group members was done by using affirming, reflective listening, and summarizing skills. Importance and confidence rulers were introduced and used from this session onwards. Elicit-provide-elicit was the MI approach that we used in this session.

In the third session, building on what the group already knew, we offered necessary information about different aspects of diabetes management. With group members' permission, this information providing was accompanied by some advice. Evoking change talk was the primary task in this session. Commitment and confidence ruler were used again in this session.

The fourth session continued to expand on the information sharing and using open ended questions we tried to evoke and reinforce change talk. Discussing topics such as diabetic diet, physical activity, patient-doctor relationship, stress effects, and using medications were very interesting for the participants. Creating discrepancy was used as a tool for evoking motivation and we encouraged the participants to build a plan for maintaining the changes in the future.

3. Lab tests and psychological instruments

The blood glucose levels of the participants in the experimental group were measured a week before the start of treatment (pre-test), a week after the last session of the MI group therapy (post-test), and two months after the post-test (follow-up) through the HbA1c test. The tests were performed by a lab technician who was blind to the distribution of subjects in the experimental and control groups and were checked twice by a laboratory specialist, again blind to the study participants. A1c is the minor hemoglobin component which is produced by the chemical condensation of hemoglobin and glucose in red blood cells. The rate of A1c production is directly proportionate to average concentration of glucose within the red cells during its lifespan which is about 120 days. This makes

it an excellent marker of overall glycemic control during a four month time frame.

The participants also completed the Diabetes Treatment Satisfaction Questionnaire (DTSQ) in pre-test, post-test, and follow-up stages. At the end of the last intervention session, the participants in the experimental group completed the Client Satisfaction Questionnaire (CSQ). The questionnaires were anonymous and were coded by the researcher and distributed to the participants. The completed questionnaires were read and scored by a research assistant who was blinded to the research (single blind).

The control group also did the same tests with the same frequency and time intervals –without any psychological intervention. Diabetes treatment satisfaction in the control group was assessed in the same three stages through the DTSQ. The control group was considered as a waiting list and a similar intervention was done for them after performing the last tests. Finally, according to the objectives of the study, the data was analyzed in SPSS-20.

Diabetes Treatment Satisfaction Questionnaire: This is a scale designed for the assessment of diabetic patients' satisfaction feeling regarding the treatment they are receiving. It has 8 items; each one is scored on a scale of 0-6. The DTSQs was originally developed in the early 1980s. It is used both for research and clinical assessment. DTSQ has been specifically designed to evaluate the treatment satisfaction of diabetic patients. The scales used in this questionnaire are appropriate for patients with type 1 and type 2 diabetes [35]. The DTSQ was translated by the research team into Farsi (Persian). This version's measurement properties and reliability were good (Cronbach's a = 0.78). The instrument construct validity as well as discriminative validity were also good, higher than designated acceptable criteria.

The Client Satisfaction Questionnaire (CSQ-8): This scale has been developed to assess client satisfaction in different clinical settings. The instrument has eight sentence-items and is answered on a 4-point Likert scale. Each item is scored from 1 to 4, and thus the possible total score would be between 8 and 32. Higher scores indicate better satisfaction. CSQ was used to evaluate patient satisfaction with counseling and health services. CSQ Reliability and validity has been tested in clinical settings. CSQ-8 has been translated into Farsi earlier and its validity and reliability has been shown (Cronbach's α between 0.86 and 0.94) [36].

Results

A total number of 30 patients (fifteen in each group) finished the study. Although we randomly assigned participants to case and control group, the A1C level was slightly different in the two groups at the beginning of the study.

The results indicated that the level of glycosylated hemoglobin in the experimental group significantly improved. This effect was sustained during the follow-up period. In the pre-test, the mean A1C level was 8.23 in the experimental group. This value reached 7.32 in the post-test (one week after the intervention) and 7.00 in the follow-up stage at 2 months after the post-test (Table 1 - next page).

Repeated measures confirmed the effect of group therapy through motivational interviewing on improving the A1C level in the experimental group at the significance level of P<0.0001 (Table 2).

ANCOVA was used to analyze the mean A1C levels in the control and experimental groups at the significance level of P=0.0001 to reconfirm the results. The hypothesis of equality of means between the two groups was rejected at the post-test and follow-up stages after excluding the possible effect of the pre-test and the existing differences reflect the impact of group motivational interviewing. In addition, the effect size of 11.01% was reported for the A1C level in the experimental group. (This intervention increased satisfaction with diabetes treatment in the experimental group, which persisted during the follow-up period. In the pre-test, the mean score for satisfaction with diabetes treatment was 22.4 in the experimental group and it reached 27.3 in the post-test (one week after the intervention) and 27.9 at follow-up (2 months after the post-test). Repeated measures confirmed the effect of group motivational interviewing on increasing satisfaction with diabetes treatment among patients in the experimental group at the significance level of P=0.014.

ANCOVA was used to analyze the mean DTSQ scores in the control and experimental groups at the significance level of P=0.016 to reconfirm the results. The hypothesis of equality of means between the two groups was rejected at the post-test stage after excluding the possible effect of the pre-test and the existing differences reflect the impact of group motivational interviewing. In addition, the effect size of 17.85% was reported for satisfaction with diabetes treatment in the experimental group (Table 3).

We wanted to evaluate satisfaction with diabetes treatment in addition to satisfaction with psychological treatment (group motivational interviewing) in the intervention group. Satisfaction with psychological treatment was assessed using CSQ. Its results indicated that it can be used as a criterion for the assessment of satisfaction of type 2 diabetic patients. Their result was positive with group motivational interviewing. Maximum total score was 32 and the mean score was 25.53 and the mean to total score ratio is 79%.

Table 1. Mean and standard deviation of HbA1C and DTSQ in MI and control group

Indexes	Groups	Period	M	SD
HBA1C	MI Group	Pre-test	8.23	1.1037
		Post-test	7.32	0.9361
		Follow up	7.00	0.7977
	Control Group	Pre-test	7.98	0.7975
		Post-test	8.12	0.8596
		Follow up	7.99	0.8859
DTSQ	MI Group	Pre-test	22.4	4.53
		Post-test	27.3	5.27
		Follow up	27.9	4.70
	Control Group	Pre-test	24.8	3.98
		Post-test	24.3	4.25
		Follow up	25.6	5.28

Table 2. Results of repeated measures of HbA1C and DTSQ in MI and control groups

Indexes	Groups	N	F	P
HBA1C Pre-test, Post-test, Follow up	MI Group	15	18.615	0.0001
	Control Group	15	1.068	0.372
DTSQ Pre-test, Post-test, Follow up	MI Group	15	5.978	0.014
	Control Group	15	1.080	0.368

Table 3. Results of ANCOVA of HbA1C and DTSQ in MI and control groups

Indexes	Period	F	P
HBA1C MI Group &Control Group	Post-test	20.264	0.0001
	Follow up	22.551	0.0001
DTSQ MI Group &Control Group	Post-test	6.628	0.016
	Follow up	3.468	0.073

Conclusion

The results showed that group motivational interviewing was effective in improving the level of glycosylated hemoglobin. When patients cooperated to improve their glycemic control and realized they could significantly affect this control, their satisfaction with diabetes treatment increased. One possible explanation is that these patients' expectation of endocrinologists and internists who were previously considered as the only people responsible for the treatment was reduced and patients considered themselves responsible for their own treatment. In our study patients have gained a better satisfaction with their previous treatment as well as good satisfaction with the group motivational interviewing. These patients can influence and improve their own health through motivational interviewing and by increasing their motivation and achieving better self-efficacy and higher confidence. By this kind of change we can increase life expectancy and prevent the development of diabetes complications in these patients.

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