The knowledge and attitude of pregnant women about preservation of umbilical cord blood in public and private cord blood banks in referrers to the therapeutic and health centers affiliated to Abadan School of Medical Sciences

Shima Azadpour (1)
Somayeh Igder (2)
Parisa Rokhfiroz (3)
Zahra Gorjian (4)

(1) Faculty member of Hematology and Blood Banking Department. Abadan School of Medical Sciences, Abadan, Iran.
(2) Department of Biochemistry, School of Medicine, Shiraz University of Medical Sciences,Shiraz, Iran.
(3) MSc Student of clinical Microbiology. Abadan School of Medical Sciences, Abadan, Iran.
(4) Faculty member of Nursing Department, Abadan School of Medical Sciences, Abadan, Iran.

Corresponding author:
Zahra Gorjian.
Abadan School of Medical Sciences Abadan,
Abadan, Iran
Email: gorjianzah@gmail.com

Abstract

Background: Maintenance and preservation of umbilical cord blood suggests that the benefits of using stem cells in the treatment of many diseases are being considered around the world. The aim of this study was to investigate the knowledge and attitude of pregnant women about preservation of umbilical cord blood in public and private cord blood banks in referrers to the therapeutic and health centers affiliated to Abadan University of Medical Sciences in 2016.

Materials and methods: All pregnant women who referred to the health centers were selected by the census as a sample. In this descriptive cross-sectional study, the instrument was a questionnaire which consisted of three parts: demographic characteristics (7 questions), knowledge (9 questions), and attitude (21 questions) and was filled in by 170 pregnant women. Questions about attitude were based on the proportion of women's knowledge . Scores of knowledge were categorized into three groups: low-level of knowledge (less than 6), moderate (7 to 13) and good (up to 20). The scores of attitude were classified into three groups: negative attitudes (less than 2) indifferent or neutral (2 to 4) and positive attitude (up to 5) were classified. To determine the relationship between knowledge and attitude with age, occupation, education level of descriptive and inferential statistics Spearman correlation coefficient and statistical tests Wallis Kruskal,

t. test and one - way ANOVA, were used. Data were analyzed using Statistical Software SPSS, version20. In all cases, p<0.05 was considered as the significant level.

Results: More than half of women had a low-level of knowledge (69.3%) and the majority (57.1%) had a positive attitude, respectively. 78 % of pregnant women chose the storage of umbilical cord blood in public cord blood banks and 13.5% a private cord blood bank. There was no significant relationship between knowledge and attitude with age (p< 0.05) and the relationship between knowledge and attitude with the employment and education was significant (P<0.05). The findings of this study showed that the majority of pregnant women have a positive attitude towards donation of the cord blood, but most of them had low-level of knowledge.

Conclusion: According to our results, the need for training and informing families about donation and the storage of umbilical cord blood for the improvement of the level of knowledge and increase of stem cell donors is essential.

Key words: Attitude, Cord blood, Knowledge, Pregnant women

Introduction

Stem cells are unspecialized cells in the human body that have the ability to become specialized cells with specific functions. These cells with the production of similar stem cells through a process called self-renewal, can provide unlimited proliferation and differentiation into various cells causing the regeneration and repair of damaged tissue in vivo [1]. Actually, these cells by transplanting into those tissue will replace damaged cells and are effective in improving damaged tissues of the body [2]. Since the issue of cord blood preservation has increased, the benefits of using stem cells have been considered in the treatment of many diseases, like cancer so that the patients can receive chemotherapy and radiation therapy. The patients of thalassemia need to replace stem cells because of genetic defects, construction disorder of hematopoietic cells. Stem cells are also used in the treatment of disorders of the immune system and some heart and liver diseases. Nowadays, these cells can be used in the treatment of diseases such as diabetes, cardiovascular and neurogenerative diseases. Although this hypothesis requires further investigation in the future[3], generally we can say that all the treatments based on stem cells are not futuristic. Stem cells are obtained from different sources; one of them is bone marrow stem cells and the other types are obtained from the blood of the umbilical cord and the placenta. Blood of the umbilical cord has younger cells than other sources and do not cause genetic mutation; besides with collection from the cord, there is use of waste tissue unlike adult tissues such as bone marrow, and does not require surgery, and cord blood stem cells are not like embryonic stem cells that are obtained by destroying an embryo. The collection and storage of stem cells provides a good source of cells for transplantation and cellular therapy for persons when it is necessary due to the possibility of rejection, which is caused through transplantation of stem cells, which is nullified for others [4]. Other advantages of umbilical cord blood includes the reduction of the rate of rejection reactions, graft-versus-host, the reduction of immunological rejection of the transplant due to the presence of immature immune cells in cord blood. The possibility of successful transplantation with less similarity of HLA between donor and receiver and the reduction of the possibility of transmission of viral infections of the placenta as a barrier preventing the penetration of the virus to the fetus and the presence of stem cells with high power amplification , etc [5],[6] could be other advantages. Recently, storage of umbilical cord blood stem cells has been done in private and public cord blood banks. 75 % of umbilical cord banks are public and 25 % of them are private, around the world [7]. There are three public cord blood banks in Iran, including Royan Institute of blood transfusion, bone marrow transplant center of Shariati Hospital and a private bank of Umbilical cord stem cells of embryos companies [8]. The public cord blood banks act as donor centers while the private cord blood banks are centers that families can store their child's cord blood stem cells for transplantation when needed. The only difference between them is that the families have to pay money for storage of umbilical cord blood in private cord blood banks. According to the studies, the presence of both banks is essential for our society. In this way, families have the chance to store their baby's umbilical cord blood [8].

The goals of this study were to check the knowledge and attitudes of the pregnant women about the importance of umbilical cord blood storage in public and private cord blood banks in Abadan, and its application therapy. In fact, its importance was furthermore suggested to pregnant women to assure them that their infant's cord blood storage increases the number of Iranian cord blood banks and the recipients over time. Nevertheless, several Asian and European countries have done similar research in this field. Because of the difference in lifestyle, income, culture, religious belief of Iranian people, results of their knowledge and attitude of pregnant women to their babies cord blood storage is not reliable. Therefore, the existence of such contradictions and because a similar proposal in this field has not been done in Iran yet, this research was a new idea for surveying the knowledge and attitude of pregnant women about storage of umbilical cord blood of their newborns and the possibility of establishing of an umbilical cord blood bank in Abadan. Since there is no cord bank in Abadan, the conditions and requirements to establish it are too limited, so this research is different from other studies in this field.

Methods

This cross-sectional descriptive study was performed on pregnant women from 2014 to 2015. In this study, the tool for data collection was a questionnaire compiled by the researcher consisting of three main parts, personal characteristics, and 6 questions about (knowledge), and 20 questions about (attitude), respectively. The information of pregnant women in health centers was recorded for prenatal care; therefore, all of them formed our sampling. People who did not want to participate in this study were excluded from our sample population. The knowledge and attitude of the pregnant women about cord blood storage was checked through the designed questionnaire. The first part of the questionnaire included demographic characteristics such as age, education level, job status, and perceived income level. The second part of the questionnaire consisted of separate questions to assess the knowledge and attitudes of all women who were referred to health centers who were questioned according to the designed questionnaire by Katz et al in 2011,[9],[8]. In connection with the questions related to knowledge, the correct options and YES had a score of 1 and the opposite options and NO had a score of 0. The Score of knowledge was divided into 3 groups: Low level (a score of less than 6), middle (a score of 7-13), and good knowledge level, a score of higher than 20. Also the Score of attitude was classified into 3 groups, negative attitude (a score of less than 2), intermediate or neutral attitude (a score of 2 - 4) and positive attitude (a score of higher than 5). After studying the latest scientific literature, the questionnaire was examined by 3 gynecology and obstetrics specialists and a PhD in Hematology and necessary recommendations and modifications were instituted. Its reliability was evaluated 0.79 by repeated test. The correlation coefficient was calculated and that indicated the reliability of the questionnaire. The internal consistency obtained by Cronbach's alpha for questions of knowledge was 88 % and for questions of attitude was 95.5%. Collected data were analyzed using SPSS version 20, descriptive statistics (in order to provide variable frequency, percent, the mean, standard deviation and other statistics factors)

and tests of t-test, One way ANOVA and Kruskal Wallis.
The significance level of less than 0.05 was considered.

Results

199 people fully completed the questionnaires and the data was studied. Variables included age, level of education, job status, perceived income level, knowledge and attitude. The mean and standard deviation were calculated from obtained scores from the questionnaire. According to the results, the knowledge level of women was divided into three categories of low, intermediate and good. Total frequency of knowledge was 85.4% while the highest percentage of knowledge related to women with weak knowledge was 33.2% (Table 1). Moreover, total frequency of attitudes was obtained at 78.9% with the highest frequency in women with positive attitudes 8%, (Table 2). It was found that about 78.5 % of women's attitude showed agreement to storage of umbilical cord blood in public cord banks while 13.5 percent of them disagreed to store umbilical cord blood in private cord blood banks.

The Kruskal Wallis test was used to examine the relationship between knowledge and attitude with age in four age groups (<18, 18-36, 36-40, >40). The results of the test of non-parametric Kruskal Wallis showed that there was no statistically significant relationship between knowledge (X 2 :1.947, p: 0.583) and attitude (X 2 : 0.314, p: 0.575) and age range in the four age groups.

Table 1: Frequency distribution of knowledge of pregnant women about umbilical cord blood stored in public and private cord blood banks among the patients of health centers in Abadan from 2014 to 2015

Knowledge		Number	Percent	Valid Percent	Cumulative Percent
	Low (a score of less than 6)	138	69.3	81.2	81.2
Valid	Middle (a score of 7-13)	24	12.1	14.1	95.3
	Good (a score of higher than 20)	8	4.0	4.7	100.0
	Total	170	85.4	100.0	
	Missing System	29	14.6		
	Total	199	100.0		

Table 2: Frequency distribution of attitude of pregnant women about umbilical cord blood stored in public and private cord blood banks among the patients of health centers in Abadan from 2014 to 2015

Attitude		Number	Percent	Valid Percent	Cumulative Percent
	Negative (a score of less than 2)	1	.5	3.6	3.6
Valid	Intermediate /Neutral (a score of 2-4)	11	5.5	39.3	42.9
	Positive (a score of higher than 5)	16	8.0	57.1	100.0
	Total	28	14.1	100.0	
	Missing System	171	85.9		
	Total	199	100.0		

One-way ANOVA test was used to check the level of knowledge and attitude with education. The results indicate the meaningful relationship between education with knowledge p(<0.05) while no significant relationship was seen between the attitude and education in the three categories of primary (M± SD ,13.16 ± 6.8), high school (M± SD ,14.4 ± 4.5), university (M± SD ,13.4 ± 0.89) education p(>0.05). The results of post hoc or Tukey test showed that the relationship between the woman's knowledge level and education in primary and high school education was highly significant compared to the group with university education (M± SD ,3.14 ± 1.82), p(<0.05) while significant relationship was not observed between the knowledge of primary (M± SD ,0.44 ± 0.66) and high school education (M± SD ,0.82 ± 1.31) P(>0.05). (Figure 1)

Figure 1: The correlations between women's knowledge about cord blood and their educational level
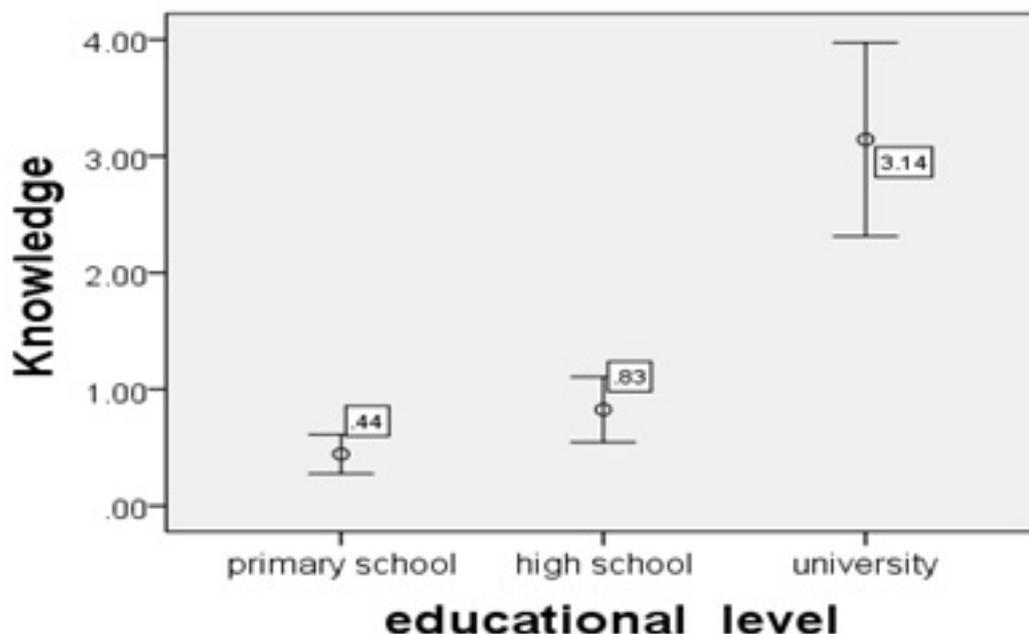
Results showed that there was a significant relationship between the woman's knowledge level and education in primary and high school education compared to the university education p(<0.05). The relationship between woman's knowledge of primary and high school education was not significant difference (p>0.05). The results of the One-way ANOVA showed that there was a meaningful relationship between knowledge and employment (p<0.05). The results of t-test showed that the knowledge of employed women about umbilical cord blood storage(M± SD ,0.71 ± 1.2) had meaningful difference compared to housewives (M± SD ,2.24 ±1.7) (P<0.05), (Figure 2). According to the results of t-test, attitude towards the knowledge did not have any significant relationship with job in both employed (M± SD ,15 ± 2.8) and housewives (M± SD ,13.6 ± 5.1) groups (p>0.05).

Figure 2: The relationship between women's knowledge about cord blood and their job status
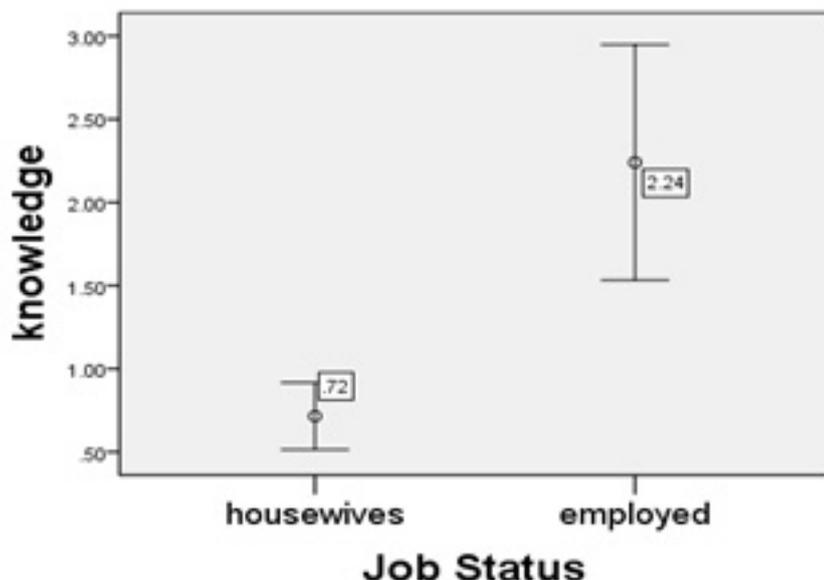
In this figure, it is obvious there is a significant difference of knowledge level of employed women compared to housewives. The results of the t-test analysis was p<0.05.

Results of One-way ANOVA showed that there was a significant relationship between knowledge and perceived monthly income level. In the level of knowledge in three different perceived monthly income levels (low, moderate and high income), there is a significant relationship only between the moderate (M± SD ,0.31 ± 0.51) and high income (M± SD ,1.4 ± 1.7) groups (P<0.05) but in other groups, such as low-income (M± SD ,1 ± 0.75) group the difference was not significant compared with the moderate and high income groups (P>0.05).

Figure 3: The correlations between women's knowledge about cord blood and their perceived monthly income level
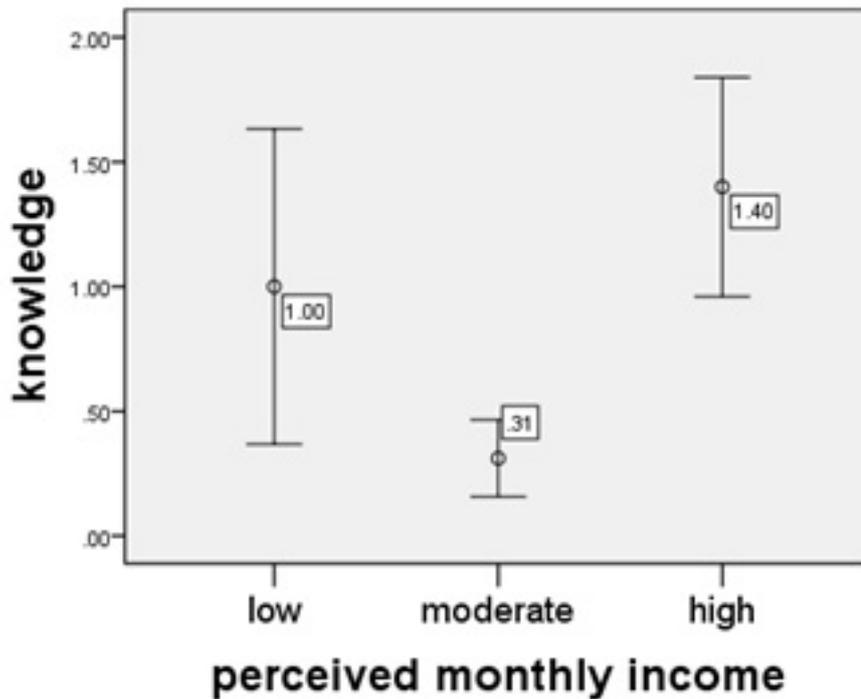
There were significant differences between individuals with moderate income and high income, (p<0.05). There is not a significant difference between people with low-income compared with moderate income and high income (P>0.05).

There was non-normal distribution of attitude survey data of women in the three levels of income related to cord blood storage, so Kruskal-Wallis test was used to compare the results of the attitudes among these three groups. Results certified that there was not a significant relationship between the income level and their attitude (X 2:2.977, p:0.226).

Discussion

Umbilical cord blood is a little blood that remains in the umbilical cord postpartum. Previously, the umbilical cord was discarded as biological waste[4]. But recently, it has been found that umbilical cord blood contains a large amount of stem cells that can be used to treat some types of diseases such as cancer, in the future[3]. Storage of umbilical cord blood and procurement of stem cells from it acts like insurance. In fact, people who make decisions to hold their infants' cord blood in private cord blood banks by paying money, are insuring their children. Although it is possible that the child will not need to use umbilical cord blood and stem cells, the high-risk diseases do not threaten them. Conservation of umbilical cord blood does not need very complicated techniques and its collection does not harm the mother or the baby. There is a very controversial question about storage of umbilical cord blood that has proponents and opponents around the world that relate to the advantage of creating a cord blood bank. Proponents of umbilical cord banks who are mostly from the medical profession and related teams have a duty to save patients in any way. Most opponents of umbilical cord banks, have an economic perspective about storing samples with high costs for several years to possibly use it for the has chance it may be needed for transplantation and its successful is doubtful [10]. The importance of this project was to advise parents to keep the baby's umbilical cord blood until the number of cord blood banks and the recipients increase in Iran. Katz and colleagues (2011) have done a study on the knowledge and attitude of the pregnant women about storage of umbilical cord blood in the European countries. In this study, 79 % of pregnant women had low knowledge of umbilical cord blood storage[9] that was consistent with the results obtained in our study where 32.2 % of pregnant women had low knowledge about umbilical cord blood storage. Most of them declared their conscious satisfaction that the baby's umbilical cord blood is stored in public cord blood banks. A similar study was also conducted by Maryia Scrinci (2011) at the University of Rome in 2012 where 55 % of pregnant women gave conscious satisfaction to store umbilical cord blood[8]. Overall, the women in our study, had low knowledge but positive attitude about their children's cord blood storage. In the other study, Katz and his colleagues (2011) found that attitude of the pregnant women was not a barrier to store umbilical cord blood as well as family income level was not related to umbilical cord blood storage[9]. Similarly, the results of our survey revealed that income levels in the type of attitude of pregnant women to collect cord blood did not have any positive effect. Continuous education for health professionals is the driving force for development and eminency regarding the storage of umbilical cord blood[11]. The results of our studies are in line with the important results of a study in five European countries. Results showed that increasing knowledge about cord blood donors can be done through the increase of educational programs [12].

The results of the questionnaire done by Rucinski (2010), suggested that awareness of married women is higher

regarding donated umbilical cord blood and in educated women and by participating in workshops and conferences they had acquired a positive attitude in relation to donating umbilical cord blood. According to our studies conducted, it was found that there is not a meaningful relationship between the level of education and attitude of married women about cord blood collection which differs from those studies[11].

In this study, the knowledge of employed women showed a significant positive relation with job status than housewives. The management of cord blood donation is based on Clary et al's research (2012), which showed that there was a significant relationship between the type of attitude toward cord blood donation and jobs status which is in agreement with our results[13].

Katz and colleagues (2011) showed that the attitude of pregnant women about the maintenance and storage of umbilical cord blood was not related to family income level. Our study also showed the similar results[9]. There was not a significant relationship between women's attitudes and family income. Studying the relationship between knowledge and the level of education, family income and jobs status about the storage of umbilical cord blood had not yet been done. So we examined such a relationship in our study. Our results showed a significant relationship between the level of education and job status. Highly educated employed women were more knowledgeable than housewives with low education, about their baby's umbilical cord blood storage. This represents the positive effect of university education and their social activities on increasing knowledge and attitude of pregnant women. The results of women's knowledge in families with different income levels showed that families with high income levels have higher awareness than families of low and middle income level. This may be due to the positive role and effect on the welfare of the family, on increasing the public knowledge about the importance of storing cord blood.

According to the findings of this study, less than half of the women had a low level of knowledge about cord blood donation which indicated a lack of suitable education and showed that they did not have training thus it can be concluded from different reasons such as the lack of awareness about donation in clinical field and suitable advertisements. Thus educating programs and creating awareness about this subject, especially in universities, society and public places, is necessary. The study to determine the effect of teaching methods on the knowledge and attitudes related to the donation of umbilical cord blood is recommended. According to the findings, less than half of all women had low knowledge and positive attitude about cord blood donation. Therefore, training programs in this area to improve their knowledge and attitude seems necessary.

References

1. Moradi S, Baharvand H. Induced pluripotent stem cells, from generation to application: review article. Tehran Univ Med J, 2014. 72 (8) : p.497-507

2. Emre, I.E., Aksoy, E., Ünal, O.F. (2017). Angiolymphoid hyperplasia with eosinophilia of the maxillary sinus and orbit. European Journal of General Medicine;14(4):116–118

3. Broxmeyer, H.E., et al. Human umbilical cord blood as a potential source of transplantable hematopoietic stem/progenitor cells. Proceedings of the National Academy of Sciences, 1989. 86(10): p. 3828-3832.

4. Rubinstein, P., Why cord blood? Human immunology, 2006. 67(6): p. 398-404.

5. Barker, J.N. and J.E. Wagner. Umbilical-cord blood transplantation for the treatment of cancer. Nature Reviews Cancer, 2003. 3(7): p. 526-532.

6. Abdullah, Y. Cord blood banking: what nurses and healthcare providers should know. MCN: The American Journal of Maternal/Child Nursing, 2011. 36(6): p. 344-350.

7. Fındık, S., Görkemli, H. (2017). Villoglandulary papillary adenocarcinoma co-existing with high-grade squamous intraepitelial lesion; arising from an endocervical polyp. European Journal of General Medicine;14(4):119–121

8. Diseases treated with cord blood; 2015. Available from: http://rpsiran.ir/forum/showthread.php?tid=3270.

9. Screnci, M., et al. Donating umbilical cord blood to a public bank or storing it in a private bank: knowledge and preference of blood donors and of pregnant women. Blood Transfusion, 2012. 10(3): p. 331.

10. Coskun, A., Ozkan, F., Ozbay, S., Okur, O.M., Kayipmaz, A.E., Gulunay, B., Eren, S.H., Ucar, A., Kavalci, C. (2017). Cyanide ingestion. European Journal of General Medicine;14(4):111–113

11. Abroun, S. Cord blood in years. Scientific Journal of Iranian Blood Transfusion Organization, 2014. 11(3).

12. Oncel-Acir, N., Solmaz, H., Cetinkaya, S., Savas, C., Dadaci, Z., Borazan, M. (2017). Herpes zoster infection after an uncomplicated cataract surgery: A case report. European Journal of General Medicine;14(4):114–115

13. Hatzistilli, H., et al. Health Professionals' knowledge and attitude towards the Umbilical Cord Blood donation in Greece. Hippokratia, 2014. 18(2): p. 110.

14. Akbuga-Ozel, B., Aksel, G., Kilicli, E., Muratoglu, M., Kavalci, C.K., Gulalp, B., Kayipmaz, A.E. (2017). Metoclopramide-induced acute dystonic reaction misinterpreted as conversion disorder and seizure. European Journal of General Medicine;14(4):122–124