Arch Iran Med. April 2019;22(4):168-173

http www.aimjournal.ir

ARCHIVES OF IRANIAN MEDICINE

Original Article

Open Access

Self-management Intervention Program Based on the Health Belief Model (HBM) among Women with Gestational Diabetes Mellitus: A Quazi-Experimental Study

Bahram Mohebbi, MD[1]; Azar Tol, PhD, MPH[2]; Roya Sadeghi, PhD[2*]; Seideh Fateme Mohtarami, MSc[2]; Ahmadreza Shamshiri, MD[3]

[1]Cardiovascular Intervention Research Center, Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, Iran

[2]Department of Health Education and Promotion, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

[3]School of Dentistry, Tehran University of Medical Sciences, Tehran, Iran

Abstract

Background: The Health Belief Model (HBM) as a conceptual framework in health behavior research was applied to improve self-management. This study aimed to determine the effect of theory-based intervention program among women with gestational diabetes mellitus (GDM).

Methods: This quazi-experimental study was conducted on 110 women 17–41 years old which were divided randomly into intervention (n = 55) and control (n = 55) groups. The intervention group received a self-management education for four sessions lasting 35–40 minutes accompanied with a phone call as a booster. Both intervention and control groups attended a routine GDM education program at outpatient health centers. A multi-section instrument included demographics, 28 items in HBM (CVI and CVR were 0.83, 0.87, respectively) and self-management sections. All participants were invited to complete the questionnaire at baseline and at three and six months after intervention. SPSS version 21 was performed for data analysis using repeated measure ANOVA and paired t-test. *P* less than 0.05 was considered statistically significant.

Results: At baseline, demographics and HBM constructs revealed no significant differences between two groups ($P>0.05$). After intervention, perceived susceptibility, severity, barriers, benefits and self-efficacy revealed significant differences in the intervention group compared with controls ($P<0.001$). Self-management and HbA1c indicated significant differences in the intervention group before and after three and six months ($P<0.001$) whereas in the control group no significant differences were revealed ($P>0.05$).

Conclusion: Implementing the HBM educational intervention program with focus on benefits of self-management has positive impact on pregnant women.

Keywords: Gestational Diabetes Mellitus, Heath Belief Model, Intervention, Self-management

Cite this article as: Mohebbi B, Tol A, Sadeghi R, Mohtarami FS, Shamshiri A. Self-management intervention program based on the health belief model (HBM) among women with gestational diabetes mellitus: a quazi-experimental study. Arch Iran Med. 2019;22(4):168–173.

Received: May 16, 2018, Accepted: February 5, 2019, ePublished: April 1, 2019

Introduction

Gestational diabetes mellitus (GDM) is one of the key public health problems both in developed and developing countries.[1] GDM is described as any degree of glucose intolerance with onset or first recognition during pregnancy.[2] In the United State of America, 1%–14% of pregnant women are at risk of developing GDM[3] and the rate is 1.3–18.6% in Iran.[1] Women with a history of GDM have a 35%–60% chance of developing type 2 diabetes (DM).[4]

Evidence indicated that risk of adverse outcomes of pregnancy including fetal macrosomia among women with poor diabetes control are common.[5] Lack of appropriate diabetes control resulted in developing diabetes complications, therefore, more considerations to prevent diabetes were recommended.[6] Diagnosis of GDM is an opportunity to engage women in performing healthy lifestyle behaviors after childbirth to prevent type 2 diabetes, but little is known about effective strategies to encourage healthy lifestyle behaviors for women especially with their new multiple roles and maternal responsibilities.

Based on the chronic nature of the diabetes and high cost of disease control, the necessity for adopting self-management behavior seems to be crucial.[7,8] Studies revealed strong association between promoting healthy lifestyle habits such as weight control, physical activity and healthy nutrition to reduce type 2 diabetes risk.[9,10] Self-management interventions framework consisting of adopting a low glycemic index diet and increasing activity level seem to be successful in reducing maternal blood glucose levels and insulin resistance during pregnancy. Sequentially, maternal blood glucose control is related to macrosomia reduction and maternal weight gain.[1,7-10]

Health Belief Model (HBM) is one of the most widely

*Corresponding Author: Roya Sadeghi, PhD; Department of Health Education and Promotion, School of Public Health, Tehran University of Medical Sciences, Tehran, IR Iran. Tel: +98-2188955888, Fax: +98-188989129, E-mail: sadeghir@tums.ac.ir

used theories in the field to examine the barriers and foundation of a person's participation in programs which focus on prevention of disease and promotion of a healthy lifestyle.[11] The HBM enables to predict behaviors according to constructs consisting of perceived susceptibility (discuss about one's belief regarding chances of getting a disease or harmful condition related to a specific behavior), perceived severity (discuss about a belief which can be harmful as a result of specific behavior), perceived benefits (refer to benefits to risk reduction of getting a disease or harmful condition related to a specific behavior), perceived barriers (refers to beliefs which can be real or imagined and their costs regarding new behavior), cues to action (forces that make one feel the necessity to take action), and self-efficacy (feel confident in having the ability to perform a behavior).[12]

To meet the research goals, the HBM was the selected model to guide self-management among women with GDM to prevent DM after childbirth, thus, this study aimed at evaluating self-management intervention based on HBM among women with GDM. Study hypotheses were: 1) HBM constructs will be improved after intervention compared with the controls; 2) Education based on HBM can improve self-management of the intervention group compared with controls; 3) The intervention group compared to control will significantly reduce level of HbA1c and obtaining desirable diabetes control and 4) the self-management intervention program has feasibility for women with GDM. Regarding lack of theory-based studies among women with GDM as a health problem in areas under supervision of Tehran University of Medical Sciences (TUMS), Iran, our intervention-based study focused on exploring the effect of self-management intervention to promote women's health in pregnancy.

Materials and Methods

Study Design and Subjects

This multi-center intervention quazi- experimental study was conducted in outpatient health clinics affiliated to TUMS during November 2015 to December 2016. Pregnant women who were newly diagnosed with GDM without history of any type of diabetes and expressed an interest in study participation were included. Pregnant women with absence more than two educational sessions were excluded. Eligible women aged 17 to 41 years old were randomly assigned to either the intervention or control groups. A sample size of 110 women would be required to confirm a minimum significant increase in self-management behavior, a power of 80% with a 0.05 two-sided significant level.[13,14]

Randomization

Randomization was performed alphabetically coded (A, B, C, D, …) and a participant attached to each health center was given numerical codes (As an example, participants in health center X were numbered X001, X002, X003, …. Participants in the randomized trial were assigned 1:1 to the intervention and control arms under restricted randomized design after informed consent and collection of baseline data. The allocation sequence was generated and released to the researcher on by another independent department specializes to generate research random sequence. Researchers, skilled data collectors, statistician were different persons. Collected data were entered into the SPSS anonymously using an unconnected person to the study.

Assessment of Outcomes

All demographic variables were classified according to participants' declaration. At baseline, HbA1c extracted from participants' medical records. After intervention, it was assessed at 3 and 6 months later according to study design. HBM constructs, self-management[15] and HbA1c were considered as primary and secondary outcome measures, respectively. In order to design HBM questionnaire, literature review using different databases based on HBM and GDM concepts were conducted. Then, the preliminary version of questionnaire was prepared. HBM constructs (perceived susceptibility, severity, barriers and benefits, self-efficacy and cues to action) questionnaires were 28 items. Each item was calculated in five-point scale (strongly agree 5 to strongly disagree 1) for five constructs whereas cues to action was measured by 'yes' or 'No' answer scoring yes as "1" and No as "zero". The higher score indicated improved knowledge and their practice-based model. The content validity was confirmed by 15 experts in Endocrinology, Genecology and Health Education and Promotion fields who were all experienced in health care fields. Feedback from the expert panel was carefully reviewed. Then, 15 experts evaluated the items' content validity index (CVI) and content validity ratio (CVR). Items with a low CVI score (<0.79) and low CVR score (<0.49) were removed from the scale.[16] The 28 items remained in the scale. The CVI and Scale CVR were 0.83 and 0.87, respectively. In order to achieve face validity, questionnaire was distributed to 30 pregnant women to assess the degree of difficulty and clarity of questions. According to this pilot study, the questionnaire was slightly modified. These participants and all information were omitted from the study. Reliability was tested using test-retest reliability scale which assured the sameness of results in each measure by different subjects at different times.[17] To perform test-retest to assess stability, a sample of 30 pregnant women was selected and Cronbach's alphas calculated for each construct ranged between 0.81-0.89; perceived susceptibility (0.84), severity (0.81), barriers (0.88), benefits (0.81), self-efficacy (0.85) and cues to action (0.87). The total Cronbach's alpha was 0.89. Some examples of items based on HBM constructs are presented in Table 1.

Table 1. Examples of Items Based on HBM Constructs Regarding Self-management

HBM Constructs	Items
Perceived benefits	1. Getting a screening test for GDM is a good investment for my health. 2. Self-Monitoring of my blood sugar can save my life. 3. Getting diabetes control doesn't need lots of time.
Perceived barriers	1. Getting diabetes control only gives me problems. 2. I don't have enough time to adhere to my doctor's advice. 3. Getting diabetes control is time consuming.
Perceived self-efficacy	1. I believe that I can adhere to a healthy diet for GDM prevention. 2. I believe that I can manage my stress during pregnancy. 3. I believe that I should make regular visits to my physician.
Perceived susceptibility	1. Because of GDM, my baby is at risk of birth defects. 2. I am at risk of diabetes if I don't have self-monitoring. 3. I am at risk of miscarriage and stillbirth if I cannot control of my blood sugar.
Perceived severity	1. GDM, without monitoring and control, can lead to diabetes. 2. GDM may lead to diabetes which make can make a women's life difficult. 3. Non-adherence of GDM treatment regimen can lead to diabetes and serious complications.
Perceived cues to action	1. Because I listened to radio and television about managing GDM. 2. Because I understood risks of diabetes from internet. 3. Because my physician told me about risks of GDM complications.

The secondary outcomes were HbA1c (index of diabetes control) and diabetes self-management instrument. Validity and reliability of 35-items Likert self-management instrument was confirmed in Iranian version according to Tol et al study.[15] At the baseline, 16 Socio-demographic and health related questions, HBM questionnaire and self-management instrument were completed by all participants in both groups. Both intervention and control group have attended the routine health clinic-based education. In addition, participants in the intervention group received self-management educational program based on HBM.

Educational Intervention

The self-management education program was presented in four sessions lasting 35-40 minutes for each during a month. Moreover, phone calls as small booster were conducted which served as a quick reference to education and reminder to study participants. The content of educational programs included basic information regarding GDM facts, figures and self-management based on HBM constructs like perceived susceptibility and severity of gestational diabetes, barriers and benefits of self-management and perceived self-efficacy and self-management using incorporating cues to actions. Strategies such as setting achievable goals and use of motivational interviewing to increase self-efficacy were also used in educational sessions. This approach allowed women to enable, motivate, and empower to have self-management and take care of their health. During educational sessions, teaching methods were used such as lectures, power point The self-management education program was presented in four sessions lasting 35-40 minutes for each during a month. Moreover, phone calls as small booster were conducted which served as a quick reference to education and reminder to study participants. The content of educational programs included basic information regarding GDM facts, figures and self-management based on HBM constructs like perceived susceptibility and severity of gestational diabetes, barriers and benefits of self-management and perceived self-efficacy and self-management using incorporating cues to actions. Strategies such as setting achievable goals and use of motivational interviewing to increase self-efficacy were also used in educational sessions. This approach allowed women to enable, motivate, and empower to have self-management and take care of their health. During educational sessions, teaching methods were used such as lectures, power point presentation, role playing, group discussion on two specific topics entitled "healthy diet and healthy lifestyle". Ways of social support from family were considered offering empathy, concern, encouragement, or caring to the women. Moreover, self- monitoring of blood glucose used as a way to teach participants about their disease using pictures and simple instructions. At the end of each session, the educator reviewed the important topics of the session and women were encouraged to ask their questions and answered accordingly.

Women in the control group attended only the routine clinic-based education. Three and 6 months after the educational intervention, post-tests were implemented both in intervention and control group, so, they were invited to complete the questionnaire.

Statistical Methods

Kolmogorov-Smirnov test was utilized to assess the normality of data distribution. Descriptive analysis was

applied to summarize the subject's variables. Crosstabs, frequencies and descriptive statistics were used in data analysis. Repeated measured was used to data analysis. Level of significance was considered as $P < 0.05$. Data analysis performed using the Statistical Package for Social Science version 21(IBM Corp, Armonk, NY, USA).

Results

In this quazi-experimental study, 110 pregnant women with GDM participated producing a response rate 100% (n = 110). Based on Baruch study, there were two reasons for low responses rate might be considered including lack of access to all participants and deficit to collect questionnaires and follow up the participants.[18] Because of provided regular prenatal care in studied health centered we had a chance to get access to all participants.

The mean age of the participants in intervention and control groups was 30.7 ± 6.53 and 30.78 ± 6.79 years respectively. Body mass index in intervention and control groups was 27.84 ± 2.87 and 27.63 ± 4.42, respectively. Demographic characteristics tested by crosstabs, independent *t* test in 2 groups by random allocation. More than two-thirds (63.6%) of participants in the intervention and control group had positive history of type 2 diabetes. Concerning educational status, majority of women who completed high school in the intervention and control group (74.55 % and 65.46%), respectively. The majority of participants were housewives in both intervention and control groups (74.5% and 70.9%), respectively. There were no significant differences between two groups regarding demographic variables ($P > 0.05$) (Table 2).

Table 3 presented the significant statistical association between model constructs within and between intervention groups after educational program ($P < 0.001$). Also, 3 and 6 months after intervention, were modified in intervention group ($P < 0.001$), but there were no significant changes in control group ($P > 0.05$).

Discussion

According to HBM, someone that perceived susceptibility and severity of ill-health condition gets the force to engage on healthy behavior but think over the best path to be healthier by choosing best action; that are weight of balance between perceived barriers and benefits under basic assumption that people are motivated for their health. This study estimated improvement of self-management and HbA_1c of participants who received education intervention based on the concepts of HBM compared to those who just attended the routine education classes.

The overall results of this study indicated that both groups of participants had a low to moderate knowledge related to perceived susceptibility and severity (perceived threaten) score about GDM, food choices and nutrition habits, physical activity during pregnancy and GDM self-management. The educational intervention offered key points to change health behaviors by presenting suggestions of eating healthy, weight control and incorporating physical activity in daily activity. This finding suggests that the educational intervention program given to the intervention group was beneficial in increasing the diabetes knowledge based on Model constructs. Furthermore, it is important to note that post-tests data was obtained 3 and 6 months after the initial educational sessions. This issue revealed that participants were able to keep sessions information over an extended period of time. Moreover, based on the nature and methodology of current study which assessed the related variable about participants (subjective values and clinical indices) two times after intervention (3 and 6 months later) revealed that HBM based intervention compared to routine education of health centers has appropriate effectiveness which was similar to Bastani study.[19]

It is obvious that women principally during pregnancy period need to receive more support and care; and women with especial attention like GD situation need extra attention to pass this time safely using adhering healthy lifestyle as Hussain study indicated.[20] In this study, it is highlighted that younger pregnant women due to low information are more susceptible to experience pregnancy disadvantages such as GDM; this finding was in the line of another Iranian study findings.[21]

According to Bandura definition about self-efficacy

Table 2. Selected Socio-demographic Characteristics of Intervention and Control Groups at Baseline

Demographic Characteristics		Intervention		Control		*P*
		No.	%	No.	%	
Level of education	Illiterate	5	9.09	9	10.90	0.276
	High school	21	38.18	21	38.18	
	Diploma	20	36.37	12	27.28	
	University	9	16.36	13	23.64	
Family history	Yes	35	63.6	35	63.6	1.00
	No	20	36.4	20	36.4	
Economic status	Poor	4	7.3	2	3.6	0.432
	Moderate	27	49.1	23	41.8	
	Privileged	24	43.6	30	54.6	
HbA_1c (%)	Mean ± SD	9.34 ± 1.62		8.82 ± 2.14		0.151

Table 3. Score of HBM Constructs Among Participants

Model constructs	*P*	Six Months after Intervention Mean ± SD	*P*	Three Months after Intervention Mean ± SD	*P*	Baseline Mean ± SD	Group
Perceived susceptibility	<0.001	77.27 ± 9.8	<0.001	69.63 ± 9.22	0.06	55.09 ± 6.27	Intervention
		56.18 ± 6.8		55.26 ± 6.79		51.64 ± 8.05	Control
Perceived severity	<0.001	76.36 ± 10.2	<0.001	67.54 ± 10.84	0.05	57.0 ± 7.67	Intervention
		57.55 ± 7.69		57.36 ± 7.63		49.54 ± 8.48	Control
Perceived barriers	<0.001	-28.26 ± 8.68	<0.001	-19.46 ± 8.86	0.06	60.45 ± 7.02	Intervention
		1.09 ± 3.14		0.82 ± 2.84		51.91 ± 10.21	Control
Perceived benefits	<0.001	80.73 ± 10.69	<0.001	72.72 ± 10.66	0.07	63.18 ± 3.65	Intervention
		63.27 ± 3.56		63.73 ± 3.32		53.91 ± 8.96	Control
Self-efficacy	<0.001	78.81 ± 8.86	<0.001	69.73 ± 9.4	0.09	56.27 ± 10.68	Intervention
		57.45 ± 11.08		56.79 ± 10.81		47.0 ± 9.75	Control
Cues to action	<0.001	85.10 ± 15.83	<0.001	72.17 ± 17.48	0.75	46.35 ± 15.39	Intervention
		48.76 ± 19.02		47.87 ± 19.57		41.13 ± 18.35	Control
Self-Management	<0.001	84.18 ± 8.77	<0.001	73.75 ± 8.7	0.05	60.31 ± 8.08	Intervention
		62. 6 ± 9.35		61.96 ± 7.92		47.2 ± 9.38	Control
HbA1c	<0.001	6.97 ± 2.21	<0.001	7.372 ± 2.13	0.151	9.34 ± 1.62	Intervention
		9.18 ± 1.64		9.26 ± 1.62		8.82 ± 2.14	Control

Intervention group: n = 55, Control group: n = 55.

concept, "is an individual 's belief that he/she is capable of performing specific tasks to obtain certain goals and is a strong predictor of health behaviors".[22,23] Study participants reported a high self-efficacy in 3- and 6-months post-tests indicating they became confident that they could perform health behaviors, which might have been related to education strategies, health care providers and close relationship between patient-heath care providers during prenatal care.

In this study, self-efficacy was the significant predictor for adopting healthy lifestyle behaviors for pregnant women with GDM, which is consistent with previous studies in literature supports such as Kalhor et al study that indicated that running intervention programs using educational and consulting strategies can lead to better self-management and health improvement among pregnant women with low self-efficacy.[24] On the other hand, patient with more self-efficacy experience adopting more self-management behaviors which can be reachable with effective patient–provider communications.[25]

As Tol study et al reported that adopting self-management behaviors can result in empowerment and based on the nature of diabetes, the better empowering the better diabetes control. This study indicated that better self- management behaviors accompanied with better HbA1c.[26]

Based on Matris et al successful treatments for GDM have better health outcomes for women with GDM and their babies.[27]

The study results addressed that implementation of educational intervention program based on HBM caused a significant modification in HbA1c and self-management score. Based on the nature of GDM and the important role of family to have a safe pregnancy termination, implementation of family-based intervention programs is recommended.

Due to GDM theory-based study, this research can guide further large studies in this field. The limitations of the study were due to lack of studies designed based on HBM and self-management accompany with diabetes control and self-reporting the questionnaire by women with GDM.

In conclusions, our findings suggesting this theory based self-management intervention can improve healthy behaviors and diabetes control among women with GDM. In order to increase healthy lifestyle behaviors in women with GDM, interventions with focus on reinforcing self-efficacy, increasing their perceived threaten, barriers reduction, better diabetes control can lead to better self-management regarding to GDM. It seems that theory-based educational intervention focusing on diabetes risk in GDM women, improving perceived self-efficacy to adopt healthy behaviors, identifying common barriers to healthy lifestyle behaviors should be provided to both patients. Tailoring theory-based intervention program based on pregnant women's need aimed at empowering target groups might be the way forward. This important achievement highlighted the importance of considering skill entrance of target groups in this study. Evidence of this study can provide for the development of future GDM education and intervention programs.

Authors' Contribution

BM, AT and RS contributed in study design and manuscript drafting. SFM writing the proposal, participated in data collection. ASH participated in data analysis, commented on the analysis. All authors revised subsequent drafts of manuscript. RS supervised the study.

Conflict of Interest Disclosures

The authors have no conflicts of interest.

Ethical Statement

All study protocols were approved by the TUMS Educational Board and received Ethical Number (IR.TUMS.REC.1394.982) and Iranian Registry of Clinical Trials code on 19 October 2015 (identifier: IRCT2016072612460N10). To ensure ethical issue, prior to requirement and data collection, the purpose of the study was discussed and explained for both groups. Privacy and confidentiality issues were also explained and kept for both groups. There was any cost to participants involved to the study. All participants signed written informed consent.

Acknowledgement

The authors enthusiastically thank all the personnel of health centers of South Health Networks affiliated to TUMS for their cooperation. We would also like to thank educational chancellor of TUMS for partialy funding as a part of MSPH thesis.

References

1. Jafari-Shobeiri M, Ghojazadeh M, Azami-Aghdash S, Naghavi-Behzad M, Piri R, Pourali-Akbar Y, et al. Prevalence and risk factors of gestational diabetes in iran: a systematic review and meta-analysis. Iran J Public Health. 2015;44(8):1036-44.
2. Hieronymus L, Combs L, Coleman E, Ashford K, Wiggins A. Evaluation of an education intervention in Hispanic women at risk for gestational diabetes mellitus. Diabetes Spectr. 2016;29(2):115-20. doi: 10.2337/diaspect.29.2.115
3. Coustan Dr. Medical Management of Pregnancy Complicated by Diabetes. 5th ed. Alexandria, VA: American Diabetes Association; 2013.
4. Centers for Disease Control and Prevention. (CDC). National Diabetes Fact, Sheet, 2011: Fast Facts on Diabetes; 2011. Available from: http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2011.pdf. Accessed January 27, 20110.
5. EPC Evidence-Based Reports. Content last reviewed January 2017. Agency for Healthcare Research and Quality, Rockville, MD. Available from: http://www.ahrq.gov/reseach/findings/evidence-based-reports/index.htm.
6. Tol A, Azam K, Esmaeil Shahmirzadi S, Shojaeizadeh D, Mohebbi B, Asfia A, et al. Relation between empowerment of diabetes control and adoption of self-management behaviors and its related factors among type 2 diabetic patients [In Persian]. Razi Journal of Medical Sciences. 2012;19(98):11-18.
7. Baghbanian A, Tol A. The introduction of self-management in Type 2 Diabetes care: a narrative review. J Edu Health Promot. 2012;1:35. doi:10.4103/2277-9531.102048.
8. García AA. Clinical and life quality differences between Mexican American diabetic patients at a free clinic and a hospital-affiliated clinic in Texas. Public Health Nurs. 2008;25(2):149-1458. doi: 10.1111/j.1525-1446.2008.00691.x.
9. England LJ, Dietz PM, Njoroge T, Callaghan WM, Bruce C, Buus RM, et al. Preventing type 2 diabetes: public health implications for women with a history of gestational diabetes mellitus. Am J Obstet Gynecol. 2009;200(4):365.e1-368. doi:10.1016/j.ajog.2008.06.031.
10. Knowler WC, Barrett-Connor E, Fowler SE, Hamman RF, Lachin JM, Walker EA, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med 2002;346(6):393–403. doi:10.1056/NEJMoa012512.
11. National Cancer Institute (NCI). (2005). Theory at a glance: A guide for health promotion practice (second edition). Available from: http://www.cancer.gov/PDF/481fd53-63df-41bc-bfaf-5aa48ee1da/TAAG3.pdf. Accessed September 21, 2010.
12. Sharma M. Theoretical foundations of Health Education Health Promotion. 3rd ed. United State: Jones and Bartlett Learning; 2017.
13. Jalilian F, Zinat Motlagh F, Solhi M, Gharibnavaz H. Effectiveness of self-management promotion educational program among diabetic patients based on health belief model. J Educ Health Promot. 2014;3:14. doi: 10.4103/2277-9531.127580.
14. Khiyali Z, Manoochri M, Khani Jeihooni A, Babaei Heydarabadi A, Mobasheri F. Educational intervention on preventive behaviors on gestational diabetes in pregnant women: application of Health Belief Model. Int J Pediatr. 2017;5(5):4821-31. doi: 10.22038/ijp.2016.7750
15. Tol A, Mohajeri Tehrani MR, Mahmoodi G, Alhani F, Shojaeezadeh D, Eslami A, et al. Development of a valid and reliable diabetes self-management instrument: an iranian version. Journal of Diabetes and Metabolic Disorders. 2011; 10:18-24.
16. Hyrkäs K, Appelqvist-Schmidlechner K, Oksa L. Validating an instrument for clinical supervision using an expert panel. Int J Nurs Stud. 2003;40(6):619-25.
17. Mathai E, Allegranzi B, Kilpatrick C, Pittet D. Prevention and control of health care-associated infections through improved hand hygiene. Indian J Med Microbiol. 2010;28(2):100-106. doi:10.4103/0255-0857.62483
18. Baruch Y. Response rate in academic studies: A comparative analysis. Human Relations, 1999; 52(4): 421-38. doi: 10.1177/001872679905200401
19. Bastani F, Zarrabi R. Correlations of Self-efficacy among women with gestational diabetes [In Persian]. Hayat. 2011;16(3,4):56-65.
20. Hussain Z, Yusoff ZM, Sulaiman SA. Evaluation of knowledge regarding gestational diabetes mellitus and its association with glycaemic level: A Malaysian study. Prim Care Diabetes. 2015;9(3):184-90. doi: 10.1016/j.pcd.2014.07.007
21. Rahimian-Boogar I, Besharat MA, Mohajeri-Tehrani MR, Talepasand S. Diabetes self-management: social, demographical and disease factors [In Persian]. Journal of Clinical Psychology. 2010;1(4):43-57.
22. Bandura A. Self-efficacy. In: Ramachaudran VS, ed. Encyclopedia of Humanbehavior. New York: Academic Press; 1994. Available from: http://www.des.emory.edu/mfp/Bandura1974EHB.pdf. Accessed October 2, 2010.
23. Bandura A. Health promotion from the perspective of social cognitive theory. Psychology and Health. 1998;13:623-49.
24. Kalhor M, Samiirad F, Barikani A, Safarpoor D, Shirali MH. Relationship between self-Efficacy with adverse delivery and neonatal outcomes in pregnant women with gestational diabetes admitted to Kowsar Hospital of Gazvin in 2013[In Persian]. Journal of Clinical Care. 2015;2(3):28-38.
25. Rose V, Harris M, Ho MT, Jayasinghe UW. A better model of diabetes self-management? Interactions between GP communication and patient self-efficacy in self-monitoring of blood glucose. Patient Educ Couns. 2009;77(2):260-5. doi:10.1016/j.pec.2009.03.026.
26. Tol A, Baghbanian A, Mohebbi B, Shojaeizadeh D, Azam K, Shahmirzadi SE, et al. Empowerment assessment and influential factors among patients with type 2 diabetes. J Diabetes Metab Disord. 2013;12:6.1-5. doi: 10.1186/2251-6581-12-6.
27. Martis R, Crowther CA, Shepherd E, Alsweiler J, Downie MR, Brown J. Treatments for women with gestational diabetes mellitus: an overview of Cochrane systematic reviews. Cochrane Database Syst Rev. 2018; 14;8:CD012327. doi: 10.1002/14651858.CD012327.