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EFFECT OF INTERVENTION BASED ON HEALTH BELIEF MODEL ON THE CHANGE IN NUTRITIONAL BEHAVIOR OF PREGNANT MOTHERS WITH IRON DEFICIENCY ANEMIA REFERRED TO URMIA HEALTH CENTERS

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ABSTRACT

Background: Nowadays, iron deficiency anemia (IDA) is one of the most common health and nutritional problems worldwide. IDA in pregnant women leads to preterm labor and low birth weight neonate. This study was aimed to determine the effect of intervention based on health belief model (HBM) on nutritional behavior of pregnant women referred to health centers of Urmia in 2016.

Materials and Methods: The present study was an interventional study with pre-test and post-test control group. Subjects were selected randomly from 90 pregnant women with low blood hemoglobin below than 11 mg / dl in 6-10 weeks of pregnancy. The data collection tool was a researcher-made questionnaire based on HBM which was used after calculating reliability and validity. Initially, a pre-test was conducted and then educational-based sessions were conducted in the intervention group. Data were analyzed using SPSS version 20, independent t-test, paired t-test and Chi-square test. P <0.05 was considered significant.

Results: According to the results of the study, in the pre intervention stage, there was no significant difference between the two intervention and control groups regarding demographic variables, but after the educational intervention, the mean of model constructs in the intervention group, in particular perceived susceptibility (29.066 ± 2.725) and knowledge (23.000± 2.763) was significantly increased (P <0.05).

Conclusion: The results of this study showed the effectiveness of education using HBM in promoting the nutritional behavior of pregnant women. Therefore, educational interventions are recommended based on HBM.

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Introduction

Anemia is one of the public health problems worldwide, with serious consequences for human health and the economic and social development of human societies. Generally, it is believed that 50% of the cases of anemia are iron deficiency anemia (IDA), but this proportion may vary among demographic groups and in different regions based on regional conditions. [1].

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Anemia is one of the most common and forgotten nutritional deficiencies in the world, in such way that affects almost a quarter of the world's population. Its adverse health outcomes affect people of various social groups and all age groups, especially women of childbearing age and children [2, 3].

According to World Health Organization, the prevalence of anemia in women aged 15-59 years in the developed countries is 10.3 percent, while in developing countries it reaches 42.3 percent, and in pregnant women is 22.5% and 52%, respectively [4]. Based on the results of various studies in Iran, the prevalence of IDA in pregnant women varies from 3.4% to 21.5% [5]. Complications of IDA include early exhaustion and reduced physical activity, boredom, headache, decreased work capacity and economic capacity, immunosuppression and lymphocytes B, reduced resistance to infection, and in pregnant women, an increase in the incidence of infection, death, low birth weight and preterm delivery [6-9].

There are various strategies to improve the condition of anemia during pregnancy such as nutritional improvement with individual education and counseling, and increasing the knowledge of the family's food, especially mothers. This part is the basic and principle part during pregnancy [9]. Nutrition of pregnant mothers should be such that supply both nutrients of the body and successful lactation [10], and since pregnant mothers are interested in health recommendations because of their interest in their fetus and their health, then they are seeking useful information, so it will be important to review their behavioral changes during this period to plan for changes in food habits [11]. Individuals' beliefs and behaviors regarding behavior change can play a significant role in developing appropriate interventions. Considering that behavioral change is more difficult using traditional learning, the use of theories and model such as HBM can have desirable results [12].

One of the most accurate and important patterns that can be used to determine the relationship between health beliefs and behavior is health belief model (HBM), based on this model, the decision and motivation of a person to choose a behavior is related to perceptions of a person at risk psition (perceived sensitivity) and severity (perceived severity), his belief in the usefulness of action to reduce the risk of a disease, or to understand the benefits of health action (perceived benefits) with respect to its barriers and moderating factors such as demographic characteristics and psychosocial variables. Cues to action also facilitate the adoption of health behavior [13]. This model generally focuses on the change in one's beliefs and believes that change in beliefs leads to a change in behavior [14].

Researchers from different countries have successfully used the constructs of this model to describe the preventive behaviors of diseases and behaviors of visiting health centers for receiving health services, including screening for various illnesses [15-17]. In Iran, in recent decades, various studies were performed such as assessing the status of pregnant women in the field of urinary tract infections, measuring their self-care behaviors in diabetic patients, and measuring oral and dental care behaviors based on HBM[18-20].

There are various factors involved in maternal and fetal health, which changing the proper nutritional behavior during pregnancy is one of the important factors and there are some studies on the anemia of pregnancy have been conducted with nutritional interventions [20, 21], but the effective interventions will not be specify without specified model. Regarding the importance of women's health, the present study was aimed to evaluate the effect of intervention based on HBM on the nutritional behavior of pregnant woman with iron deficiency anemia referred to health centers of Urmia in 2016.

Method and Materials

This clinical trial study with IRCT code IR012166121824340N10 was conducted on 90 anemic pregnant women referred to health centers of Urmia, Iran. For sampling, the city was first divided into 3 districts (north of city = level 1, center of city= level 2, south of city = level 3). Then two health centers were selected randomly from each region, one center as intervention and another as control. Then 15 pregnant women were selected from each center usong convenience sampling according to inclusion and exclusion criteria as well as informed consent (6 centers and 90 people in total).

Inclusion criteria were included: age 18-35years, 6-10 weeks pregnancy, having no specific underlying disease according to the mother (chronic renal failure and HIV infection; parasitic infections; malaria; schistosomiasis and infections with hookworms), anemia due to iron deficiency (hemoglobin less than 11 mg/dL) and satisfaction to enter the study; reading and writing skills and lack of less than three years with previous pregnancies;. Exclusion criteria were included: preeclampsia and eclampsia; gestational diabetes; preterm labor; having more nausea and vomiting during pregnancy and having BMI less than 18.5 and more than 25. To begin the study, the necessary permissions was taken for implementation and coordination with the research environments from the selected centers and the primary questionnaire was completed by the pregnant mothers.

In the intervention group, 4 educational sessions, once a week and each session 60-90 minutes were held with the presence of the researcher. The principles of focus group discussions were used in the sessions. At the end, booklet and educational pamphlets were given to the mothers who participated. Two months after the completion of the educational sessions, the questionnaires were again filled up by the pregnant mothers in the two groups.

The data collecting tool was a questionnaire of 89 questions that was designed according to HBM. The questionnaires were distributed to 10 faculty members of Urmia University of Medical Sciences (5 midwifery members, 2 nutritionists, 1 gynecologist and 2 health education members), after receiving comments, CVR index was applied to all questions above 65% and CVI for all questions above 79%. For confirmation of reliability, a questionnaire was delivered to 15 pregnant women with study criteria (other than the participating groups) and Cronbach's Alpha was obtained 80 % for knowledge and 79% for model constructs. The designed questionnaire was based on HBM including demographic characteristics (16 questions),

knowledge (15 questions), perceived sensitivity (7 questions), perceived severity (5 questions), perceived benefits (6 questions), perceived barriers (7 questions), cues to action (8 questions), and self-efficacy (5 questions) using 5-point Likert from 1 (completely disagree) to 5(completely agree.

Perceived susceptibility to pregnancy nutrition was accompanied with beliefs such as the risk of malnutrition for the health of the mother and the fetus, which higher score showed higher sensitivity to anemia during pregnancy. Perceived severity was accompanied with beliefs such as the risk of limited fetal growth, preterm delivery as well as perceived benefits was accompanied with beliefs such as maternal health and fetal growth with proper nutrition to eliminate anemia. In this study, perceived barriers was accompanied with beliefs such as maternal nasea and vomiting, stomach burning, constipation, hemorrhoids and economic problems as well as self-efficacy was accompanied with beliefs such as the ability and confidence to have proper nutrition and finally cues to action was designed based on having or not having cues with 8 questions which had two point, yes=1score and no=0 score. In the knowledge section, 15 questions were designed for three score options (true= 2) and (false= 0) and (I do not know=1). Finally, the nutritional behavior of pregnant women in the intervention and control groups was also assessed using questionnaire including 20 questions in the 3-point Likert were evaluated including most often=2, sometimes=1, and never=0. Additionally, there were 14 questions about compliance with the principles of proper nutrition and the use of iron-rich food sources, 2 questions about compliance with the correct principles of pregnancy supplements and 2 questions about the health of handwashing and disinfection of fruits and vegetables as well as 2 questions about follow up and performing the required health-care system to relieve anemia.

The mean score of this part was 20 points. In this research, after collecting data and inserting them in SPSS version 20, t-test was used to compare the mean of the two groups. For comparison of the mean beetween groups, the paired t-test was used for comparison of the mean within groups. To compare the proportions, Chi-square test was used. Ethical issues in the present study included obtaining a code of ethics and written informed consent, allowing the right to leave for the intervention group at any time and providing the educational pamphlet to the control group after the end of the study.

Results

In this study, there was no significant difference regarding demographic variables between the intervention and control groups before the intervention (Table 1). The majority of mothers were in the age group of 20-30 years. The level of education among pregnant women in two groups was diploma (31.1%) and the majority of women in the two groups were housewives (86.66%). The housing and economic situation in the two groups were equal and the iron consumption pattern was arranged in two groups.

The mean of gestational age was 9 weeks in two groups. The mean weight of mothers in two groups was 62 kg as well as the mean of height were 160 cm, respectively. BMI in the control and intervention groups were 23.45±1.40 and 23.38±1.36, respectively. The mean number of pregnancies was the second pregnancy and the mean size of household was 3 and 33.3% of previous delivery among participants was vaginal delivery (33.3%) and cesarean section was done in 24.4% of participants and nulliparous history in the control and intervention groups were 19 women (42.3%) and 15 women (33.3%), respectively. The results showed that there was no significant difference between the two intervention and control groups in terms of the health belief constructs and nutritional behavior before the intervention. Based on independent t-test, the mean scores of knowledge, model constructs, self-efficacy and nutritional behavior after intervention were significant compared to the control group (P <0.001) (Table 2).

Table 1. Comparison of qualitative and quantitative demographic characteristics between groups

variable		Control		Intervention		Statistics
		N	%	N	%	
Age of mothers	>20	3	6.7	2	4.5	X^2=4.55 df=2 P =0.1
	20-30	28	62.2	19	42.2	
	31-35	14	31.1	24	53.3	
Educational level	Elementary and middle	7	15.6	13	28.9	X^2=4.18 df=3 P =0.24
	Under diploma	7	15.6	8	17.8	
	Diploma	18	40	10	22.2	
	college	13	28.8	14	31.1	
Economic Status	Income more than expenditure	3	6.7	6	13.3	X^2=3.47 df=2 P =0.17
	Income equal to expenditure	36	80	28	62.2	
	Income less than expenditure	6	13.3	11	24.4	
Pattern of iron consumption	Arranged	38	84.4	40	88.9	X^2=0.38 df=1 P =0.53
	Unarranged	7	15.6	5	11.1	

Table 2. Comparison of mean, standard deviation and significant level of HBM and nutritional behavior in both groups before and after intervention

Constructs	Control	Intervention	P value
	Mean± SD	Mean± SD	
Knowledge	18.32±3.62	18.02±3.51	**0.73**
	18.22±3.92	23.00±2.76	**<0.001**
Perceived Susceptibility	26.08±4.04	26.22±4.51	**0.88**
	26.04±3.07	29.06±2.72	**<0.001**
Perceived Severity	20.08±3.34	20.31±3.43	**0.75**
	20.13±3.21	21.93±1.45	**<0.001**
Perceived Benefits	24.26±3.60	24.40±3.99	**0.86**
	24.06±3.27	25.93±2.12	**<0.002**
Perceived Barriers	21.17±3.90	21.31±4.71	**0.88**
	21.18±3.61	25.46±2.56	**<0.001**
Self-efficacy	20.17±3.37	19.77±3.26	**0.56**
	20.09±3.19	21.97±1.27	**<0.001**
Cues to Action	4.68±1.68	4.42±1.86	**0.48**
	4.67±1.80	7.13±0.34	**<0.001**
Nutritional behavior	12.79±1.73	12.55±1.58	**0.50**
	12.86±1.74	30.22±1.08	**<0.001**

Discussion

Pregnancy period is one of the most critical periods of women's lives and has a major impact on lifestyle and nutritional behaviors, and the nutritional status of women during pregnancy can have a significant impact on their health and on the development of the fetus. [22]. The aim of this study was to determine the effect of intervention based on HBM on nutritional behavior of pregnant women with IDA referred to selected health centers of Urmia in 2016. In this research, the couples of the intervention and control group were matched in terms of quantitative and qualitative demographic characteristics including age of women, occupation, education, and the number of children. There was no significant differences were observed in the quantitative and qualitative demographic characteristics of the research units between the two groups. Based on the findings of this study, knowledge about the nutritional behavior of pregnancy in the intervention group after the intervention significantly increased, and this confirms the effectiveness of the educational program designed based on HBM in promoting nutritional behavior of pregnant women under intervention.

These results were consistent with the results of various studies on pregnant women in different countries, so that the results of Sukandara et al. in 2015 [23], Khorramabadi et al. in 2014 [24], Imdad et al. in 2012 [25], Amer et al. in 2010 [26] and Baharzadeh et al. in 2016 [27] showed that education improves knowledge of nutrition during pregnancy and nutritional behavior and the constructs of HBM. It should be noted that although knowledge is necessary for changing behavior, but it is not enough and nutritional knowledge and behavior do not necessarily have a positive relationship [28], so that the study of Burr et al. in the United Kingdom [29] showed that despite the provision of knowledge for pregnant women, there was no improvement in their nutritional behaviors.

The lack of significant positive effects on nutrition education in this study can be attributed to other factors other than mere information (knowledge) such as lifestyle [30], community beliefs [31], economic status [32] and access to food [29, 32]. It is worth to say that due to the importance of the constructs of the HBM and the special sensitivity of mothers regarding the health of the fetus, they can provide a good opportunity for more effective educations to them.

The results of this study indicated that the theory-based education improves the mean score of the HBM patterns in the intervention group compared to the control group two months after the intervention, which has been significantly improved ($P<0.05$). Significant increase in the components of the model (sensitivity, severity, benefits and self-efficacy) has also been achieved in several other studies, including Karimi et al. in 2015, regarding the impact of beliefs on nutritional behaviors in pregnant women in Saveh city [33], Ahmadpour et al. in 2013, entitled “Effectiveness of Nutrition Education Based on HBM during Pregnancy on Knowledge and Attitude of Women Referred to Health Centers of Gonbad Kavoos City “[34]. Study of Sharifirad et al. in 2013 as the comparison of the effectiveness of nutrition education program based on HBM with traditional education in weight gain during pregnancy [9], Khorramabadi et al. in 2016 evaluated the effect of education based on HBM on nutritional beliefs of pregnant women [24], which showed an increase in the mean components of HBM after education.

According to the results of the present study, self-efficacy has a direct and significant relationship with the promotion of nutritional behavior of mothers, which was consistent with a study conducted by Zareban et al. in 2014 [35] that in his study, self-efficacy had a direct and significant relationship with nutritional behaviors and self-efficacy was a significant determinant

in following a healthy diet. Therefore, it is a fact that it is necessary to provide the necessary education to pregnant women in order to accept the benefits of proper nutrition and overcoming existing barriers.
Concerning the cues to action based on the participants' viewpoints, the role of physicians and health staff in transmitting health messages has been greater. One of the important advantages of this study is the target community (anemic pregnant mothers), which is less commonly considered in other studies. . Therefore planning and implementation of educational program based on HBM with increasing self-efficacy of pregnant women is necessary in order to prevent anemia and promote nutritional behaviors with proper and balanced diet and proper health behaviors during pregnancy.

Conclusion

In this research, based on the statistical results, there was a significant difference between the control group and the intervention group in all constructs of HBM and nutritional behavior that shows the effect of HBM on promoting nutritional behavior of pregnant women with iron deficiency anemia. Therefore, education and interventions based on this model have been able to increase the knowledge of pregnant mothers and their behavior by fearing that complications of iron deficiency anemia will develop their neonate and identifying the existing barriers and understanding the benefits of appropriate adopting with nutritional behavior and increasing their self-efficacy. And ultimately reduces anemia and its effects, such as low birth weight, abortion, and maternal death. This is an important step in keeping the family safe.

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Conflict of interest

The authors declare that there is no conflict of interest in this study.

References

1. Organization WH. Iron deficiency anaemia: assessment, prevention and control: a guide for programme managers. 2011.
2. Haidar J. Prevalence of anaemia, deficiencies of iron and folic acid and their determinants in Ethiopian women. Journal of health, population, and nutrition. 2010;28(4):359.
3. Righetti AA, Koua A-YG, Adiossan LG, Glinz D, Hurrell RF, N'Goran EK, et al. Etiology of anemia among infants, school-aged children, and young non-pregnant women in different settings of south-central Côte d'Ivoire. The American journal of tropical medicine and hygiene. 2012;87(3):425-34.
4. Morrone A, Nosotti L, Piombo L, Scardella P, Spada R, Pitidis A. Iron deficiency anaemia prevalence in a population of immigrated women in Italy. The European Journal of Public Health. 2010;22(2):256-62.
5. Barooti E, Rezazadehkermani M, Sadeghirad B, Motaghipisheh S, Tayeri S, Arabi M, et al. Prevalence of iron deficiency anemia among Iranian pregnant women; a systematic review and meta-analysis. Journal of reproduction & infertility. 2010;11(1):17.
6. Charles AM, Campbell-Stennett D, Yatich N, Jolly PE. Predictors of anemia among pregnant women in Westmoreland, Jamaica. Health care for women international. 2010;31(7):585-98.
7. Domellöf M, Thorsdottir I, Thorstensen K. Health effects of different dietary iron intakes: a systematic literature review for the 5th Nordic Nutrition Recommendations. Food & nutrition research. 2013;57(2):50-2.
8. Osungbade KO, Oladunjoye AO. Preventive treatments of iron deficiency anaemia in pregnancy: A review of their effectiveness and implications for health system strengthening. Journal of pregnancy. 2012;2012(1):68-87.
9. Sharifirad GR, Tol A, Mohebi S, Matlabi M, Shahnazi H, Shahsiah M. The effectiveness of nutrition education program based on health belief model compared with traditional training. Journal of education and health promotion. 2013;2(1):15-30.
10. Hoffmann JF, Nunes MAA, Schmidt MI, Olinto MTA, Melere C, Ozcariz SGI, et al. Dietary patterns during pregnancy and the association with sociodemographic characteristics among women attending general practices in southern Brazil: the ECCAGe Study. Cadernos de saude publica. 2013;29(5):970-80.
11. Huberty J, Dinkel D, Beets MW, Coleman J. Describing the use of the internet for health ,physical activity, and nutrition information in pregnant women. Maternal and child health journal. 2013;17(8):1363-72.
12. Davis R, Campbell R, Hildon Z, Hobbs L, Michie S. Theories of behaviour and behaviour change across the social and behavioural sciences: a scoping review. Health psychology review. 2015;9(3):323-44.

13. Shojaezadeh D, Mehrab BA, Mahmoodi M, Salehi L. To evaluate of efficacy of education based on health belief model on knowledge, attitude and practice among women with low socioeconomic status regarding osteoporosis prevention. Iranian Journal Of Epidemiology. 2011;7(2):30-7.
14. Shamsi M BA, Mohamadbeygi A, Tajik R. The effect of educational program based on Health Belief Model on preventive behavior of self-medication in woman with pregnancy in Arak. Iran Pejouhandeh. 2010;14(6):324-31 7.
15. Green EC, Murphy E. Health belief model. The Wiley Blackwell encyclopedia of health, illness, behavior, and society. 2014;1(2):78-85.
16. Davis JL, Buchanan KL, Green BL. Racial/ethnic differences in cancer prevention beliefs: applying the health belief model framework. American Journal of Health Promotion. 2013;27(6):384-9.
17. Julinawati S, Cawley D, Domegan C, Brenner M, Rowan NJ. A review of the perceived barriers within the health belief model on pap smear screening as a cervical cancer prevention measure. Journal of Asian Scientific Research. 2013;3(6):677.
18. Taghdisi M NE. Evaluation of pregnant women in the field of Urinary Tract Infection according to the components of Health Belief Model. Community Health Journal. 2011;8(4):36-42.
19. Baghianioghadam MH, Mohammadi SM, Fallahzade H, KHabiri F. . Status of walking behavior in patients with type 2 diabetes in Yazd based on health belief model. jornal of health. 2010;6(3):425-35.
20. Mahmoodabad SM, Tanekaboni NR. Survey of some related factors to oral health in high school female students in Yazd, on the basis of health behavior model (HBM). Journal of Birjand university of medical sciences. 2008;15(3):40-7.
21. Garg A, Kashyap S .Effect of counseling on nutritional status during pregnancy. The Indian Journal of Pediatrics. 2006;73(8):687-92.
22. Bakhtiari A, Sajadi P, Hajian K. Nutrient consumption pattern in pregnant women referred to health care centers in babol. 2007.
23. Dadang Sukandara AK, Faisal Anwarc. . Nutrition Knowledge, Attitude, and Practice of Mothers and Children Nutritional Status Improved after Five Months Nutrition Education Intervention. International Journal of Sciences. 2015;23(2):424-42.
24. Khoramabadi M ,Dolatian M, Hajian S, Zamanian M, Taheripanah R, Sheikhan Z, et al. Effects of education based on health belief model on dietary behaviors of Iranian pregnant women. Global journal of health science. 2016;8(2):230.
25. Imdad A, Bhutta ZA. Routine iron/folate supplementation during pregnancy: effect on maternal anaemia and birth outcomes. Paediatric and perinatal epidemiology. 2012;26(s1):168-77.
26. Amer M E-KF, Solliman NM, EL-nana H. . Effect of Nutritional Interventions on Anemic Pregnant Women's Health Using Health Promotion Model. The Medical Journal of Cairo University. 2010;78(2):109-18.
27. Baharzadeh K, Marashi T, Saki A, Zare Javid A, Araban M. Using of health belief model to promote preventive behaviors against iron deficiency anemia among pregnant women. Journal of Research and Health. 2017;7(2):754-62.
28. Gilkey MB, Earp JAL, French EA. Applying health education theory to patient safety programs: three case studies. Health Promotion Practice. 2008;9(2):123-9.
29. Burr M, Trembeth J, Jones K ,Geen J, Lynch L, Roberts Z. The effects of dietary advice and vouchers on the intake of fruit and fruit juice by pregnant women in a deprived area: a controlled trial. Public health nutrition. 2007;10(6):559-65.
30. Vameghi R, Mohammad K, Karimloo M, Soleimani F, Sajedi F. The effects of health education through face to face teaching and educational movies, on suburban women in childbearing age. Iranian journal of public health. 2010;39(2):77.
31. Anderson AS, Campbell DM, Shepherd R. The influence of dietary advice on nutrient intake during pregnancy. British Journal of Nutrition. 1995;73(2):163-77.
32. Yeh M-C, Ickes SB, Lowenstein LM, Shuval K, Ammerman AS, Farris R, et al. Understanding barriers and facilitators of fruit and vegetable consumption among a diverse multi-ethnic population in the USA. Health Promotion International. 2008;23(1):42-51.
33. Karimy M, Taher M, Fayazi N, Bayati S, Rezaei E, Rahnama F. Beliefs Effective on Nutritional Practices of Pregnant Women in Health Centers of Saveh, Iran. J Educ Community Health. 2015;2(3):28-35.
34. Ahmadpoor H MA, Shojaizadeh D. Effectiveness of Nutrition Education Based on Health Belief Model during Pregnancy on Knowledge and Attitude of Women Referred to Health Centers of Gonbad Kavoos City. Journal of Neyshabur University of Medical Sciences. 2015;3(2):52-60.
35. Zareban I, Karimy M, Niknami S, Haidarnia A, Rakhshani F. The effect of self-care education program on reducing HbA1c levels in patients with type 2 diabetes. Journal of education and health promotion. 2014;3.