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Short Report

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Effect of Preconception Care Education by Health Volunteers on Knowledge and Attitudes of Women: Application of the Health Belief Model

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Abstract

Preconception care identifies and modifies the risk factors for pregnancy and childbirth. The present study aimed to determine the effects a preconception care education program, which was based on the Health Belief Model (HBM) and implemented by health volunteers, on knowledge and attitudes of women. A semi-experimental study was conducted using 22 health volunteers and 110 women aged 15-49 years selected from two comprehensive health centers of Mashhad, Iran, in 2016. The convenience sampling method was employed for selecting the volunteers and the regular random sampling method for choosing the women. For data collection, we applied a researcher-made tool with verified validity and reliability. HBM-based education was implemented by the volunteers during three sessions. Data analysis was performed in SPSS using Mann-Whitney test, Friedman, and Spearman's rank correlation coefficient; repeated measures data analysis was carried out at the significance level of 0.05. The mean age of the women was 30.6±6.6 years in the intervention group and 31.6±6.5 years in the control group. The mean levels of knowledge and attitude increased significantly after the intervention (P<0.001). We suggest using the current educational intervention based on the HBM to promote women's knowledge and attitudes towards preconception care.

Keywords: Attitudes, Health volunteers, Knowledge, Preconception care, The Health Belief Model

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Introduction

Preconception care is a process that identifies social, behavioral and environmental risks of a woman's fertility and pregnancy, and then diminishes these risks through proper prevention, education, and intervention before pregnancy (1, 2). In the developing countries, more than a quarter of women of reproductive age suffer from diseases and complications following pregnancy and childbirth due to limited preconception care (3). In a study by Komiti et al. (2013), researchers reported 30% or less preconception care in their research units (4). Bayrami et al. (2014) stated that more than half of women (53.4%) did not receive any prenatal care (5). Barchloo and Carbord (2013) found that 59.9% and 18.5% of women had moderate and poor knowledge respectively regarding folic acid consumption before pregnancy. Furthermore, 37.6% had a wrong attitude towards the effects of folic acid, and 34.5% of them did not have any knowledge about the effect of folic acid in pregnancy(6).

The effect of educational interventions depends on the use of an appropriate model for implementing an educational program (7, 8). The Health Belief Model (HBM) is an effective cognitive psychology model used to support interventions for health behavior change (9). This model is useful for interpersonal interventions and emphasizes on internal factors such as knowledge, attitudes, and beliefs (8). In a study by Ahmadpoor et al. (2015), HBM-based education promoted the knowledge and attitudes of pregnant women regarding nutrition during pregnancy (10).

The health volunteer plan was implemented in Iran according to the Declaration of Alma-Ata based on public participation in the health care system. Health volunteers cooperated with regional comprehensive health centers and shared their education with 50 households (11). Mazloomy et al. (2012) and Setoudeh et al. (2016) investigated positive effects of educational programs implemented by health volunteers on women's knowledge, attitudes, and performance (12, 13).

Considering the importance and low prevalence of preconception care, the important role of health volunteers in transferring of health concepts to society, and importance of application of health education and promotion models, thus in the present study, we aimed to determine the effects of HBM-based preconception care education implemented by health volunteers on knowledge and attitudes of women covered by health centers of Mashhad, Iran, in 2016.

Methods

A semi-experimental study with a pretest-posttest design was conducted. The target population consisted of 15 to 49-year-old married women with the intention of pregnancy under the coverage of comprehensive health centers of Mashhad, Iran, in 2016.

The women's sample size was calculated based on Stern's et al. study (2013) (14), where the mean scores of knowledge after intervention were 8.9 and 6.8, respectively, in intervention and control groups, and using the formula for comparison of means in two independent groups with confidence of 95% and power of 80%. The standard sample size was calculated at 43 women for each group. However, 55 participants were allocated to each group considering a probable attrition of 30%. This amount of obtained sample based on the mean knowledge in each group of women can provide an effect of 42% for attitude changes in two groups at the confidence level of 95% and power of 80%.

We performed a multi-stage sampling. From five centers of Mashhad, Health Center 2 was selected through the convenience sampling method, and then two comprehensive health centers were selected as intervention and control groups randomly.

Each volunteer was responsible for educating five women. Therefore, 11 volunteers were selected from the intervention centers and 11 from the control centers by using the convenience sampling method. The women were chosen by using the regular random sampling method. The inclusion criteria for the health volunteers were as follows: high school diploma or higher education, Iranian citizenship, residence in Mashhad, and available phone number. The inclusion criteria for the female subjects comprised of: being married, having intention for pregnancy, Iranian citizenship and aged 15 to 49 years, residence in Mashhad, and having a phone number. The exclusion criteria included unwillingness to continue attending the educational sessions and exposure to a stressful event during the study.

According to our review, there were not any standard tools for evaluating the target variables , and thus, a tool was designed by the current researchers including a knowledge questionnaire (19 true and

false items), with a score range of 0-19, and an attitude questionnaire, which comprised of 10 questions rated using a 5-point Likert scale ranging from totally agree to totally disagree. The scores for each question ranged from -2 to +2; the minimum and maximum possible scores were respectively -20 and 20. The HBM questionnaire was designed based on Champion's questionnaire (15). The extended parallel process model (EPPM) proposed by Kim Witte was utilized in the formulation of the perceived sensitivity and severity questions (16). The questionnaire consisted of 61 items in four subscales of perceived sensitivity (17 items) with score of -34 to +34, perceived severity (15 items) with score of -30 to +30, perceived benefits (18 items) with score of -36 to +36, and perceived barriers (11 items) with score of -22 to +22.

The face and content validities of the questionnaires were evaluated and approved by the seven faculty members at the school of Nursing and Midwifery, Mashhad University of Medical Sciences. Regarding reliability the Cronbach's alpha coefficients were calculated at 0.68, 0.65, 0.92, 0.85, 0.93, and 0.89 for knowledge, attitudes, sensitivity, severity, perceived benefits, and barriers, respectively.

The intervention group volunteers were trained by the main researcher according to HBM during four sessions. The education program involved lectures, group discussions, role plays, and question and answer. The first session was an introduction to HBM. The second session dealt with the goals of preconception care and involved role plays for reporting pregnancy and childbirth complications in mothers and infants among friends, relatives, and neighbors in order to increase perceived sensitivity. The third session was on preconception intervention and care and the consequences of not receiving any care to increase perceived severity. The fourth session focused on the benefits of preconception care, the introduction of barriers, and their adjustment to increase benefits and reduce perceived barriers to preconception care. The control group volunteers received the regular education by a trainer.

The women in the intervention group were trained by volunteers during three sessions. The education program was implemented in the presence of a researcher at the Comprehensive Health Center (5 cases) and in health volunteers' houses (6 cases). The control group women were trained by the control group volunteers according to the usual program schedule. The questionnaires were completed by the women trainees in both groups before and immediately and four weeks after the intervention.

The data collection process was initiated after gaining the approval of the Research Ethics Committee of Mashhad University of Medical Sciences and other necessary licenses. The participants were informed of the research objectives and the voluntary nature of their participation. Further, the participants were assured of the confidentiality of their personal data and written informed consent was obtained from them.

Data analysis was performed using SPSS, version 16. The normal distribution of the variables was determined by the Kolmogorov-Smirnov test. The mean, standard deviation, and table of frequency distributions were used to describe demographic information and personal characteristics. Data analysis was performed through independent t-test, Friedman, Mann Whitney, Wilcoxon, Chi-square, and Spearman tests, as well as repeated measures data analysis. P-value less than 0.05 was considered statistically significant.

Results

The mean ages of the participants in the intervention and control groups were 30.6±6.6 and 31.6±6.5 years, respectively, indicating that they were not different in this regard. The mean durations of marriage were 19.8±5.0 and 22.4±5.9 years in the intervention and control groups, respectively; the groups were significantly different in this respect (P=0.01). The mean numbers of gravidity were respectively 2.4±4.3 and 1.7±0.5 in the intervention and control groups, showing no significant different between the two groups. Despite the fact that most of the participants in the intervention group (n=37; %67.3) and control group (n=22; 40%) had high school diploma, the two groups were significantly different in terms of educational level (P=0.01). The groups were not different regarding the mean age of the youngest child, spouse's education, and household income (P>0.05).

We found no significant relationship between towards preconception care knowledge score and occupational status, spouse's education, household income, and incentive resources (P>0.05), there was only a significant association between knowledge score and women's educational level (P=0.03). With regards to attitude, we did not observe any significant association between attitude and

occupational status, educational level, spouse's education, household income, and incentive resources (P>0.05).

The internal correlation between the model constructs and the women's knowledge and attitude towards preconception care as evaluated by Spearman test indicated significant relationships of sensitivity, severity, and perceived benefits and barriers with knowledge and attitude scores (P<0.05) .

The Mann-Whitney test showed that the mean scores of knowledge were significantly different between the intervention and control groups before the intervention (10.3±3.4 and 11.8±3.0, respectively, P=0.02). According to the inter-group comparison by the Mann-Whitney test, the difference in mean knowledge score 4 weeks after education than before education was significant between the intervention and control groups (8.6±4.8 vs. 2.2±2.8, P<0.001; Table 1).

Repeated measures data analysis was performed to control the intervention variables. Results indicated that the mean increase in knowledge scores of the intervention group was 5.2 scores higher than that in the control group; this difference was statistically significant (P<0.001; Table 2).

At pre-intervention, the mean attitude score was 4.1±5.1 in the intervention group and 6.4±4.5 in the control group according to the independent t-test, revealing a significant difference between the two groups (P=0.008). Inter-group comparison by Mann-Whitney test reflected no significant difference between the intervention and control groups regarding mean attitude score 4 weeks after education than before education (3.7±4.6 vs. 3.0±6.3, P=0.22; Table 1). Repeated measures data analysis was carried out to control the intervention variables. The obtained results indicated that the increase in the mean attitude score was 2.7 scores greater in the intervention group than that in the control group; this difference was statistically significant (P<0.01; Table 2).

Table 1. Comparison of mean knowledge and attitude scores of women before and immediately and four weeks after education in both intervention and control groups

Variable		Intervention	Control	Test results
		Mean±Standard deviation	Mean±Standard deviation	
Knowledge	Before education	10.3±3.4	11.8±3.0	*P=0.02
	Immediately after education	17.9±2.9	13.8±2.6	*P<0.001
	Four weeks after education	18.9±3.8	14.0±2.5	*P<0.001
	Difference before and after the education	7.6±4.1	2.0±3.4	*P<0.001
	Difference after four weeks and before	8.6±4.8	2.2±2.8	*P<0.001
	Result of Friedman test	P<0.001	P=0.001	
Attitude	Before education	6.4±4.5	4.1±5.1	**P=0.008
	Immediately after education	8.1±4.5	6.8±5.3	**P=0.18
	Four weeks after education	10.4±4.7	7.0±4.6	*P<0.001
	Difference before and after the education	1.6±4.9	2.8±6.0	*P=0.73
	Difference after four weeks and before	3.7±4.6	3.0±6.3	*P=0.22
	Result of Friedman test	P<0.001	P=0.02	

*= Mann-Whitney test, **= Independent t-test

Table 2. Results of repeated measures data analysis for determining the effects of education on women's knowledge and attitude at week 4 after education

			Regression coefficient	Standard error (SE)	T-value	Sig.
Knowledge	Group	Intervention	5.22	0.64	8.14	<0.001
		Control (reference)	0			
	Education degree	Under high school diploma	0.52	0.90	0.57	0.568
		High school diploma	0.41	0.79	0.51	0.607
		Academic (reference)	0			
	Perceived severity		-0.024	0.044	0.55	0.579
Attitude	Group	Intervention	2.74	0.91	2.99	0.003
		Control (reference)	0			
	Attitude		0.28	0.09	2.90	0.005
	Perceived severity		0.06	0.06	0.92	0.362

Implications for Practice

Our results indicated that the mean knowledge and attitude scores of the subjects towards preconception care were significantly increased in intervention group than the control group; thus, the HBM-based education promoted the women's knowledge and attitude towards preconception care. Bebis et al. (2012) investigated the effectiveness of HBM-based education in increasing knowledge and attitudes towards the Pap smear test in Turkey. Their results were consistent with the present findings. The study by Bebis et al. was different from our study in that he selected intervention and control groups from a similar location (17). According to a study by Jahangiri et al. (2011), which aimed to use HBM in breast cancer screening, there was a significant difference between intervention and control groups after education in terms of mean knowledge and attitude scores. This finding was consistent with the results of the present study (18). The mentioned study was similar to the current one in terms of follow-up period and considering four HBM constructs including sensitivity, severity, and perceived benefits and barriers.

The present educational interventions using Health Belief Model can be used by health care providers in educational programs to promote women's knowledge and attitudes towards preconception care. Also, it can be incorporated as a guide for educating health volunteers.

Future studies are recommended to use larger sample sizes to predict the role of the model constructs in increasing knowledge and attitude towards preconception care. Furthermore, other health education models that consider interpersonal and social factors affecting preconception behavior could be used to compare their effectiveness with that of HBM-based education.

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Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

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