



Original Article

The Effect of Educational Program on Increasing Cervical Cancer Screening Behavior among Women in Hamadan, Iran: Applying Health Belief Model

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ABSTRACT

Background: The systematic application of Pap test helps early diagnosis and effective treatment of cervical cancer. This study was conducted to assess the effect of education on health beliefs and practice of women eligible for Pap test using Health Belief Model (HBM).

Methods: This quasi-experimental study was conducted in Hamadan City, the west of Iran, in 2010 using before-after design. In this study, 70 women aged 16 to 54 years participated voluntarily who had never done Pap test until the date of the study. The volunteers were divided into several small groups. For each group, 2-hour training session was held twice. The data collection tool was a self-administered multi-choice questionnaire that was developed based on HBM constructs. Health beliefs and practice of the target group were evaluated pre-intervention and four months later.

Results: Our findings indicated that education based on HBM was effective and could enhance the participants' knowledge significantly and improve the HBM constructs including perceived susceptibility, severity, benefits, and barriers. The training program enhanced the practice from zero before intervention to 81.4% after that. The results of the present study revealed that increase in knowledge had effect on the HBM constructs. Furthermore, there was a significant relationship between knowledge and both age and educational level.

Conclusion: Health education based on HBM can enhance women's knowledge of cervical cancer, change their health beliefs and improve their behaviors regarding screening programs like Pap test.

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Introduction

Cervical cancer, caused by Human Papilloma Virus (HPV), is the second most common cancer in women worldwide ¹. It is also an important leading cause of death from neoplasm among women in

low-income countries ². HPV infection is common and preventable and now widely established as a necessary risk factor associated with the development of almost all cases of cervical cancer ³.

Despite its invasive characteristics, due to having a long incubation period, cervical cancer can be detected in early pre-invasive stage by the systematic application of a screening Pap test⁴. A single negative Pap test reduces the risk of cervical cancer to 45% and nine negative tests during lifetime reduce the risk to 1%⁵. In developing countries, the knowledge of cervical cancer importance is limited among general population and even among health workers and policy makers. The quality of screening programs and health care is also poor⁶.

The systematic application of Pap test in women is depended on their knowledge, attitudes, beliefs and behaviors regarding this effective screening program⁷. The Health Belief Model (HBM) is one of the most famous frameworks, which are widely used for understanding health behavior. The rationale of HBM is based on that people often take health-related actions if they feel those actions can prevent negative health outcomes. HBM consists of various constructs including perceived susceptibility, severity, barriers, and benefits; in addition to self efficacy, cues to action, and health action⁸.

We conducted the present study to assess the effect of training using the HBM in order to promote women's knowledge and change their health beliefs to do Pap test.

Methods

This quasi-experimental study was conducted in Hamadan City, the west of Iran, in 2010, using before-after design. One of the 12 urban health centers of the city was selected in which the coverage of Pap test was the lowest. In this study, 70 women aged 16 to 54 years were invited and participated voluntarily who had never done Pap test until the date of the study. In order to find and enroll the eligible women, we searched the household records that were available in the local health centers. Then we invited them to participate in this study.

Sample size was calculated at 95% significant level and 90% statistical power. Based on the results of previous studies⁹, the value of P was different for various components of HBM. Accordingly, the maximum calculated sample

size of 63 was considered for this study. On the other hand, the participants were to be followed for four months. Hence, we increased the sample size to 80 to deal with possibility of lost to follow up. From 80 eligible participants, eight were lost during the follow-up period and two were excluded for other reasons. Thus the number subjects remained for data analysis consisted of 70 volunteers.

The volunteers were divided into seven 10-member groups. For each group, 2-hour training session was held twice. In each session, various training methods were used for all groups in the same manner including lectures, question, and answer, group discussion and showing slides. Pamphlets were distributed among the participants as well. Two months later, a follow-up training session was held for all participants. In order to assess the effect of training intervention based on HBM, the knowledge, beliefs, and practice of the participants were evaluated at the beginning of the study and four months later.

Data collecting tool was a self-administered multiple choice questionnaire included the following four sections: (a) demographic characteristics (3 questions), (b) knowledge of cervical cancer and Pap test (12 questions), (c) beliefs including perceived susceptibility, severity, benefits and barriers (6 questions for each), and (d) practice (4 questions). Validity of the questionnaire was evaluated and confirmed by experts in health education, epidemiology, and obstetrics. Reliability of the questionnaire was checked through a pilot study using Cronbach's alpha coefficient. The scores of alpha for the questions related to knowledge and perceived susceptibility, severity, benefits and barriers were 66%, 69%, 88%, 79% and 94% respectively. Questions regarding knowledge and perceived susceptibility were revised in order to increase their internal consistency.

Four-choice questions were considered for assessing participants' knowledge of cervical cancer and Pap test. Then, percentage of correct answers to these questions was obtained for each subject. The average score of the correct answers was calculated for all subjects in order to assess the effect of training on participants' knowledge before and after intervention. In ad-

dition, five-choice questions (including strongly agree, agree, neither agree nor disagree, disagree, strongly disagree) were used to assess different components of HBM using Likert scoring method. The score of each component, which, varied from at least five to at most 25 was reported as percentage. Then, average score of each component was calculated for all subjects in order to assess the effect of training on participants' attitude before and after intervention.

We used Wilcoxon test for comparing the mean scores of knowledge and attitude before and after intervention, Kruskal-Wallis test for assessing the mean score of knowledge across various age groups and various educational levels, and linear regression model for estimating the extend of changes in mean scores of com-

ponents of HBM per one unit increase in Knowledge.

All statistical analysis was performed at 95% significant level using statistical software STATA 11 (StataCorp, College Station, Texas).

Results

The mean age of participants was 31.3 years [95% CI: 31.1, 35.6], 59% aged 26-45 years. Most of the participants (93%) did not have academic education (Table 1). The mean difference of scores of knowledge before and after intervention was statistically significant between different age groups ($P=0.015$) and different levels of education ($P=0.027$).

Table 1: Absolute and relative frequency distribution of the participants by age groups and educational levels

Variable	Frequency		Mean difference (95% CI) ^a	Kruskal-Wallis test
	N=70	Percent		
Age group (year)				
16-25	19	27.1	48 (42, 54)	$P=0.015$
26-35	21	30.0	47 (40, 54)	
36-45	22	31.4	56 (49, 64)	
46-54	8	11.5	66 (55, 76)	
Education				
Illiterate	16	22.9	63 (56, 69)	$P=0.027$
Primary school	20	28.6	52 (43, 60)	
Secondary school	14	20.0	46 (40, 53)	
High school	15	21.4	51 (42, 60)	
Academic educated	5	7.1	45 (35, 55)	

^a Mean difference of scores of knowledge before and after intervention

Table 2: The mean score of knowledge, and perceived susceptibility, severity, benefits, and barriers in pre- and post-intervention using Health Belief Model

Items	Mean score %		Wilcoxon test
	Pre-test (95% CI)	Post-test (95% CI)	
Knowledge	39 (35, 43)	92 (89, 94)	$P<0.001$
Perceived susceptibility	62 (56, 68)	94 (92, 96)	$P<0.001$
Perceived severity	69 (64, 73)	94 (92, 96)	$P<0.001$
Perceived benefits	75 (70, 79)	96 (94, 98)	$P<0.001$
Perceived barriers	60 (54, 65)	90 (87, 93)	$P<0.001$

As shown in Table 2, the mean score of the participants' knowledge increased significantly after intervention compared to before interven-

tion ($P<0.001$). In addition, the mean scores of other constructs of the model including perceived susceptibility, severity, benefits and bar-

riers improved significantly after intervention ($P<0.001$). The most changes were related to the participants' knowledge and the lowest to the perceived benefits.

One unit increase in the mean score of knowledge significantly improved the perceived susceptibility, severity, benefits, and

barriers (Table 3). The effect of change in mean score of knowledge on perceived susceptibility was higher than the other constructs of the model ($P<0.001$). From 70 participants, 57 (81.4%) proceeded to do Pap test during the four-month follow-up period.

Table 3: The correction between knowledge and different constructs of Health Belief Model based on the analytic results of linear regression model

Items	MDS ^a	Intercept	Coefficient	EAI ^b	P-value
Knowledge	0.5238095	-	-	-	-
Perceived susceptibility	0.3176190	-0.1209871	0.8373391	0.716352	$P<0.001$
Perceived severity	0.2571429	0.0260372	0.4412017	0.467239	$P=0.002$
Perceived benefits	0.2133333	0.0441631	0.3229614	0.367125	$P=0.014$
Perceived barriers	0.3071429	-0.1041488	0.7851931	0.681044	$P<0.001$

^a Mean difference scores of the constructs of the model before and after the intervention

^b The estimated average increase in the score of each construct associated with one unit increase the score of knowledge

Discussion

Based on the results of the present study, the intervention based on HBM improved the participants' knowledge of cervical cancer significantly, changed their attitudes and motivated them to do Pap test. The results of the previous similar studies confirmed our findings. Sharifi-Rad et al¹⁰ evaluated the educational effect on the performance of the prevention of smoking in first-year highschool students of Boukan City. They indicated that all constructs of the model improved significantly after intervention. Papa et al¹¹ studied the effect of education on the knowledge, concern and desire of 50 women who were eligible to do Pap smear. They reported that 77% of the participants were encouraged to do Pap test after intervention.

We found that mean score of knowledge varied across age groups and educational level. This shows that the effect of intervention based on HBM has different effects on different age groups and education level. Tabeshian et al¹² conducted a Knowledge, Attitude and Practice (KAP) study to assess the effect of training on teachers of Isfahan County, but reported no statistically significant relationship between knowledge and both age and educational level.

We indicated that the mean score of all components of HBM increased significantly post-intervention compared to pre-intervention. Our findings are consistent with results of previous investigations. Yakhforousha et al⁹ assessed the effect of training on the voluntary health workers' knowledge and attitude regarding Pap test using HBM. Hazavehei et al¹³ performed a training program for girl students in Garmsar City and used HBM to investigate the preventive behavior of the participants regarding osteoporosis. Sharifi-Rad et al¹⁴ assessed the effect of health education using HBM on preventive action against cigarette smoking among high school students on preventive health practices of smoking in high school students has examined the results. All these studies revealed that both knowledge and attitude of the participants improved significantly after training program.

The main finding of the present study was changing in the participants' health behavior so that majority of them (81.4%) proceeded to do Pap test while they had never done Pap test previously. Park¹⁵ planned a curriculum based on HBM and trained the women and found that tendency of do Pap test and practice was higher in intervention group compared to control

group. In addition, an investigation conducted by Hazavehei et al¹³ revealed that safety training based on the HBM can improve behavior of workers practice in using personal protective equipment. These findings indicate that training based on HBM can motivate and improve the preventive health behaviors. On the other hand, Tabeshian et al¹² used KAP design to improve the health behaviors of teachers in Isfahan County to do Pap test but found no significant differences in the participants' behaviors post-intervention compared to pre-intervention.

This study had several limitations including: (a) difficult access to the target group who were eligible to do Pap test but they did not refer to the health center for screening; (b) unwillingness of the participants due to high cost of Pap test; and (c) difficulty in filling out the questionnaire because of low literacy of the participants. Despite its limitations, the results of the current study revealed that education based on HBM could improve the knowledge of general population and change the people's behaviors regarding Pap test even in low educated individuals who had never participated previously in screening programs of the cervical cancer.

Conclusion

We concluded that health education based on HBM can enhance women's knowledge of cervical cancer, change their health beliefs and improve their behaviors regarding screening programs like Pap test even if they had never participated in preventive programs.

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Conflict of interest statement

The authors declare that they have no conflict of interests.

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References

1. Armstrong EP. Prophylaxis of cervical cancer and related cervical disease: A review of the cost-effectiveness of vaccination against oncogenic HPV types. *J Manag Care Pharm.* 2010;16(3):217-230.
2. World Health Organization. Cancer fact sheet No. 297. WHO Web Site; [update 1 February, 2011; cited 25 March, 2011]; Available from: <http://www.who.int/mediacentre/factsheets/fs297/en/index.html>.
3. Warren JB, Gullett H, King VJ. Cervical cancer screening and updated Pap guidelines. *Prim Care.* 2009;36(1):131-149.
4. Berek JS. *Berek & Novak's Gynecology.* 14th ed. Philadelphia: Lippincott Williams & Wilkins; 2007.
5. Wong LP, Wong YL, Low WY, Khoo EM, Shuib R. Knowledge and awareness of cervical cancer and screening among Malaysian women who have never had a Pap smear: a qualitative study. *Singapore Med J.* 2009;50(1):49-53.
6. Cain JM, Ngan H, Garland S, Wright T. Control of cervical cancer: women's options and rights. *Int J Gynaecol Obstet.* 2009;106(2):141-143.
7. Sach TH, Whynes DK. Men and women: beliefs about cancer and about screening. *BMC Public Health.* 2009;9:431.
8. Glanz K, Rimer BK, Viswanath K. Health Behavior and Health Education: Theory, Research, and Practice. 4th ed. San Francisco: John Wiley & Sons; 2008.
9. Yakhforoushha A, Solhi M, Ebadifard A. Effects of education via health belief model on knowledge and attitude of voluntary health workers regarding Pap smear in urban centers of Ghazvin. *Faculty of Nursing of Midwifery Quarterly.* 2009;18(63):25-30. [Persian]
10. Sharifirad Gh, Hazavehie SMM, Mohebi S, Rahimi MA, Hasanzadeh A. The effect of educational programme based on Health Belief Model (HBM) on the foot care by type II diabetic patients. *Iranian Journal of Endocrinology and Metabolism.* 2006;8(3):231-239. [Persian]
11. Papa D, Moore Simas TA, Reynolds M, Melnitsky H. Assessing the role of education in women's knowledge and acceptance of adjunct high-risk human Papillomavirus testing for cervical cancer screening. *J Low Genit Tract Dis.* 2009;13(2):66-71.
12. Tabeshian A, Firozeh F. The effect of health education on performing Pap smear test for prevention of cervix cancer in teachers of Isfahan

- city. *Medical Sciences Journal of Islamic Azad University*. 2009;19(1):35-40. [Persian]
13. Hazavehei SM, Taghdisi MH, Saidi M. Application of the Health Belief Model for osteoporosis prevention among middle school girl students, Garmsar, Iran. *Education for Health*. 2007;20(1):1-11.
 14. Sharifi-Rad G, Hazavei MM, Hasan-Zadeh A, Danesh-Amouz A. The effect of health education based on health belief model on preventive actions of smoking in grade one, middle school students. *Arak University of Medical Sciences Journal*. 2007;10(1):79-86. [Persian]
 15. Park S, Chang S, Chung C. Effects of a cognition-emotion focused program to increase public participation in Papanicolaou smear screening. *Public Health Nurs*. 2005;22(4):289-298.

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