RESEARCH ARTICLE

Effects of Group Training Based on the Health Belief Model on Knowledge and Behavior Regarding the Pap Smear Test in Iranian Women: a Quasi-Experimental Study

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Abstract

The Pap smear test is recommended for early diagnosis of cervical cancer. The aim of this study was to assess knowledge and behavior regarding the Pap smear test based on the Health Belief Model (HBM) in women referred to premarital counseling classes, Hamadan, Iran. This quasi-experimental study was conducted on 330 women, who were allocated randomly to two case and control groups (n=165). Two educational session classes were performed in the case group. Two stages in before and after intervention groups were evaluated. Analysis of data was performed by SPSS/16.0, using t-test, x^2, and McNemar's test. P-values <0.05 were regarded as significant. There was no significant difference between the mean scores of the various structures of this model in two groups before the intervention. However, after the intervention there were significant increase in mean score of knowledge and all variables of HBM in the intervention group(P<0.001). The findings of this study highlight the important role of education about cervical cancer on changing women's beliefs about cervical screening.

Keywords: Knowledge - cervical cancer screening - Health Belief Model - Pap smears - Iran

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Introduction

Cervical cancer is the second most common cancer after breast cancer in the world in women worldwide. More than 270,000 women die from cervical cancer every year, more than 85% of these deaths are in low and middle income countries, main cause of this problem is poor access to screening and treatment services (World Health Organization, 2013a). According to WHO's projections, deaths from cervical cancer will rise to 320,000 in 2015 and to 435000 in 2030 (World Health Organization, 2007). Cervical cancer is cause of 18% of female deaths. Prevalence of cervical cancer in Iran is 6. 64%. Cervical cancer allocated 34.2% of all women cancer in Iran. The incidence of cervical cancer has been reported in different provinces of Iran to 7.1 % and in Hamadan, a western city of Iran is 0.9 % (Rakhshani et al., 2013).

Iran has a population of more than 25 million women aged 15 years and older, who are at risk of cervical carcinoma. Cervical cancer with an age-standardized incidence rate of 2.2 per 100,000 women per year, ranks as the second most common malignancy of female reproductive system in Iran (Shafaghi et al., 2013). Cervical intraepithelial neoplasia (CIN) is a precancerous lesion that may exist at one of these three neoplasic steps: CIN1, CIN2, or CIN3. If precancerous lesion left untreated, CIN2 or CIN3 can progress to cervical cancer (World Health Organization, 2013b). Cervical cancer is caused by a common sexually transmitted infection with oncogenic types of human papillomavirus (HPV). The pathogenesis can evolve over a period of 10 to 20 years through precancerous lesions to invasive cancer and death (World Health Organization, 2008). The peak time for infection is shortly after becoming sexual active. However, permanent HPV infections with specific types of HPV (most commonly, genotypes 16 and 18) may lead to precancerous lesions. If untreated, these lesions may progress to cervical cancer (World Health Organization, 2013a).

Cervical cancer has a long premalignant period that provides the opportunity for screen and treat before it turns to be invasive cervical cancer. Nowadays, there are so many methods to detect premalignant lesion such as conventional Papanicolaou (Pap) test which is a convenient and inexpensive (Coskun et al., 2013). Human papilloma virus (HPV) is the biggest risk factor for cervical cancer, as the virus is present in 99% of cases worldwide. Other risk factors for cervical cancer,

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including early onset of sexual activity at young age, multiple sexual partner, over-aged pregnancy risk, lack of genital hygiene, nulliparity and multi-parity, alcohol and tobacco use, obesity, HIV infection, Prolonged use of oral contraceptive and Positive family history for cervical cancer (Zarchi et al., 2009; Arabaci and Ozsoy, 2012; Getahun et al., 2013; Matthews et al., 2013). women should have the first cervical cancer screening test done three years after first sexual intercourse or at age 18 years, whichever comes first, and then annually for three consecutive years (Ibekwe et al., 2010). In 2010 statistics showed that 5.8% of incident cases of severe cervical dysplasia were in women between 15 and 24 years of age, therefore it's very important to increase young women's knowledge about cervical cancer. One of the main causes of the high prevalence of poor up taking of screening in the developing world is lack of awareness; therefore providing information on cervical cancer has an important role to influence the behavior of target population (Nessa et al., 2012). Another ways for prevention of this painful cancer is the HPV vaccine and in advanced clinical testing that proven to be effective in preventing 65% to 76% of infections and lesions due to the viruses (World Health Organization, 2008). Vaccination can cause immunity both directly and indirectly through herd immunity (Khatibi et al., 2014). HPV vaccine is outside the reach of the majority of developing countries because of its expensive price (Urrutia, 2009). Unfortunately, In Iran use of this vaccine isn't cost effective and recommend to women that screen by cytology (Zarchi et al., 2009). Early detection and treatment of cervical cancer through screening programs significantly reduce the morbidity and mortality of these diseases (Reis et al., 2012).Two important ways for protection from cervical cancer are implementation of systematic screening for early detecting precancerous lesions and healthy sex life with promotion of condom use (Arabaci and Ozsoy, 2012).

Another important factor that affects applications for early diagnosis of cervical cancer is women's belief (Zarchi et al., 2009). Several theoretical approaches have been developed to explain why individuals do or do not undergo screening. The Health Belief Model (HBM) is a model developed in early 1950s by Rosenstock to help understand human behavior toward seeking health services and explain why people did not engage in behaviors for prevention or early detection of disease (Allahverdipour and Emami, 2008; Urrutia, 2009; Farooqui et al., 2013). The HBM explain that before undergoing screening, a person must believe that the problem is serious, that he/she is susceptible to the problem and that an effective action is available. Furthermore, the individual must believe that a particular action would be a beneficial in reducing susceptibility or the perceived severity (benefits), and the person must believe that the barriers to taking action will be outweighed by the benefits and that she must receive some sort of a cue to action.

An important consideration of this model is the recognition that prevention requires people to take action in the absence of illness (Allahverdipour and Emami, 2008). Cue to action is another construct of HBM which helps in the understanding of actions that trigger human behavior (Farooqui et al., 2013). Self-efficacy is another element that has been included in the health belief model in recent years; therefore, it is not mandatory to include this variable for measuring screening aspects. This model has been widely applied to various health behaviors, especially screening behaviors (Urrutia, 2009).This study was designed to assess the effect of group training based on Health Belief Model on knowledge, and behaviors of Pap smear test in women participating in mandatory premarital educational classes in Hamadan city, Iran.

Materials and Methods

Study design and participants

This was a quasi-experimental study. Participants who had consummated the eligibility criteria were randomly assigned in interventional group (n=165) and control group (n=165). The samples were recruited from premarital educational center, Hamadan, Iran, and were conducted between March 2015 and June 2015.

Sample size was estimated based on a previous study by Coskun et al (Coskun et al., 2013). The level of significance was set at 5% (α=0.05), while the power of the study (1-β) was set at 90%. The sample size formula was,

$$n = (Z_{1-\frac{\alpha}{2}} + Z_{1-\beta})^2 (\sigma_1^2 + \sigma_2^2) / (\mu_2 - \mu_1)^2$$

; for the comparison of proportions in independent groups was used to estimate the 165 minimum number of subjects required per group.

Instruments

The study data were collected using a three part instrument. In the questionnaire, the first part included the questions about socio-demographic characteristics of the participants such as age, marital status, level of education, occupation and family income, history of previous marriage, history of sexually transmitted diseases, smoking, Having medical insurance, Tendency to use contraceptives, Pap test history and family history of cancer. The second part included the questions about participants knowledge level of cervical cancer and the third part was CPC-28 Questionnaire which have six domains based on Health Belief Model including perceived susceptibility or females' opinion about chances of getting cervical cancer, perceived severity and complications of cervical cancer, perceived benefits of cervical cancer preventive behaviors, perceived barriers and self-efficacy in performing (Urrutia, 2009). Cronbach's coefficient alpha for CPC-28 Questionnaire is 0.735 and inter-item correlation is 0.083. In our study, the questionnaire was tested for reliability and validity for this group of Persian women. The Persian questionnaire scales demonstrated adequate internal consistency (Cronbach's alphas: Susceptibility Scale=0.82; Seriousness Scale=0.77; Benefits Scale=0. 94; Barriers Scale=0.91; self-efficacy and guidance for practice Scale=0.76; Preventive behaviors Scale= 0.78 and overall internal consistency= 0.89).

Intervention

This intervention was designed with pre and post-test

to explore the role of group training based on Health Belief Model on tendency to do the Pap smear test in women participating in premarital educational classes to improve cervical cancer screening in the socio-cultural context of Hamadan city, Iran. Data of the study were gathered from women who want to marry for the first time or divorced women who want to marry again, because sexuality in our society is still a taboo and can only be accepted within the familial environment.

At the beginning of the study, the pre-test questionnaire was administered to the two groups. Illiterate subjects answered the questionnaire through self-report. The intervention included two 45-60 minutes consultation sessions in the form of consulting. The training sessions were held one week in the form of 10-15 player groups. Each session included a combination of lectures, group discussion, questions and answers and power point displays. Moreover, educational pamphlets were given to the participants at the end of the last session. Both groups were assessed after educational sessions (post test). The control group did not receive any training and was only invited to the special sessions to fill out the questionnaires. However, due to ethical considerations, a training session on cervical cancer was held for this group after the completion of the study. At the end we compared the results obtained in these two steps and analyzed the collected data using. The details of the training sessions including: anatomy of genital systems of males and females with using educational aid instruments posters and moulage and information about menstruation, procedure of pregnancy, abortion and family planning and general overview of cervical cancer, including its complications and how it can be prevented, and cervical cancer screening methods, with an emphasis on screening by cervical cytology using the Pap smear. Information on the cost of the test, and where and how to access the test was also provided.

Ethical considerations

The study was performed according to the Helsinki declaration protocol. The objectives of the study were explained to the women, and informed consent was obtained from all participants. Women could leave the study at any time. The study was approved by the Ethical Committee of Hamadan University of Medical Sciences (approval number: 9307013177).

Statistical analysis

Baseline characteristics were compared between groups using independent t-tests for continuous variables and chi-square tests for categorical variables. Descriptive analyses used mean±standard deviation (minimum-maximum) and percentage (number), whereas intergroup comparisons were done using chi-square test, independent t-test, paired t-test and McNemar's test. The $p<0.05$ was considered to be significant. Data Processing and statistical analysis were performed using SPSS version 16.0.

Results

The results revealed that average age of the women were 23.00±5.10 and 22.74±5.85 years old in intervention and control groups, respectively. There was no significant difference in the age of both groups (P=0.67). 92.0% of intervention and 88.0% of control group were decided to marry for the first time. A history of drug abuse, alcohol and smoking was asked in the questionnaire but participant did not report any history of drug and alcohol abuse of themselves or their husband's because drug and alcohol abuse is a taboo in Iran. Therefore only smoking has been reported. Present findings showed that 44.5 and 38.5% of both groups had higher education. Majority of women were housewives. Homogeneity of demographic variables is shown in Table 1.

Before intervention just 45(27.3%) women in intervention group and 51(30.9%) women in control group had little information about Pap smear and 70% of the intervention group respondents and 66% of control group women didn't have any information about Pap smear test. After the intervention 99.3% of intervention group women answer to this question "do you have information about pap smear" was changed to yes but control group answers didn't change. Sources of Information of Pap smear were asked from both groups before and after prevention which is shown in Table 2. A calculation of the mean score of knowledge of the intervention group

Table 1. Descriptive Features of Study Participants

Descriptive Features		Case N=165		Control N=165		P value
		Frequency	(%)	Frequency	(%)	
Educational status	Primary school	11	6.7	18	11.5	0.55
	Secondary school	19	11.6	24	15.4	
	High-school	61	37.2	54	34.6	
	Higher education	73	44.5	60	38.5	
Occupational status	unemployed	27	16.4	24	14.5	0.65
	Employed	138	83.6	141	85.5	
Having medical insurance		101	62.8	92	56.4	0.28
Smoking		1	0.6	0	0	0.31
Family Income (Rials)	Below 10,000,000	102	64.2	90	57.3	0.12
	10,000,000-20,000,000	42	26.4	58	37	
	More than 20,000,000	15	9.4	9	5.7	
Marital status(History of remarriage)		13	8	19	11.6	0.34
Tendency to use contraceptives		111	70.7	121	74.7	0.43
History of up taking pap test		9	-5.6	10	-6.2	0.8
Family history of cervical cancer		2	-1.3	3	-1.8	0.67

Table 2. Source of Information about Pap Smear test in Respondents who had Information About Pap Smear

Source of information	Intervention Group Frequency (%)		Control Group Frequency (%)	
	Pre test N=45	Post test N=165	Pre test N=51	Post test N=51
Parents	13 (28.3)	3(2.1)	21(41.2)	21(41.2)
Husband	1 (2.2)	0	0	0
Doctors	3 (6.5)	6(4.2)	3(5.9)	3(5.9)
Midwifes	3 (6.5)	130(90.3)	8(5.9)	8(5.9)
Books & journals	3 (6.5)	1(0.7)	6(11.8)	6(11.8)
Websites	8 (17.4)	1(0.7)	2(3.9)	2(3.9)
Friends	1 (2.2)	0	2(3.9)	2(3.9)
School or university	8(17.4)	2(1.4)	6(11.8)	6(11.8)
Other sources	6(13)	1(0.7)	3(5.9)	3(5.9)

Table 3. Comparison of knowledge and Health Beliefs Factors Related to Cervical Cancer Screening in Intervention and Control Groups

Variables	intervention group			Control group		
	Pre test mean ±SD	Post test mean ±SD	P. value	Pre test mean ±SD	Post test mean ±SD	P. value
Knowledge	23.8±24.4	88.5±13.4	<0.001	20.9±24.7	21±24.7	0.32
Perceived susceptibility to cervical cancer	54.9±10.5	69.4±8.9	<0.001	57.7±7.9	56.6±8.1	0.05
Perceived severity of cervical cancer	61.8±11.3	68.2±14.3	<0.001	64.2±10	64.8±10.6	0.07
Perceived benefits of Pap test	72.6±13.5	90.9±8.2	<0.001	69.8±11.7	69.6±12.7	0.75
Perceived barriers of Pap test	65.1±13.3	77.8±12.4	<0.001	63.1±9.4	63.5±10.3	0.06
Self-efficacy and guidance for practice	61.7±12.2	72.8±11.3	<0.001	62±8.7	61.8±9	0. 07

women before intervention and after our educational class showed significant differences (P<0.001) and no significant differences were found in regard to the women's knowledge about Pap test in control group after routine premarital class (P=0.32). According to our data, before intervention about 78% of both groups' participants didn't know about signs and symptoms of cervical cancer and 91.5 % of them didn't hear anything about HPV virus.

According to our finding, in intervention group perceived susceptibility, severity of cervical cancer, benefits and barriers of up taking Pap test and self-efficacy and guidance for practice were increased significantly (P<0.001). In control group there weren't any significant differences between pre and post test score of knowledge and other variables of HBM after routine premarital class (Table 3).

In this study, it was found out that before intervention 33% of women in intervention group, had willingness to be screened and after educational session participants tendency to be screened elevated to 96% (P<0.001, x^2 =104, df=3) and tendency to do Pap smear in control group in pretest was about 44% and it was 47% in posttest (p=0.43, x^2 =2.8, df= 3).

After intervention there was a significant difference in tendency to do Pap smear between women, who had less than college education and women who had college or above education (62.0 *vs*. 81.8 %, p=0.003). It was found out that there is relationship between education levels and tendency to do Pap smear test in participants (P=0.003; x^2=19.5). In other word, higher levels of education lead to increase tendency to do Pap smear test in participants.

According to our findings, there were significant association between level of education and knowledge about Pap smear (P<0.006; F=3.4), Preventive behaviors (P<0.001; F=5.5), variables of HBM such as susceptibility (p=0.043; F=2.3) , barriers (P<0.001; F=4.5), benefits(p=0.023; F=2.6) and self-efficacy and guidance for practice (p=0.013; F=2.9) but there wasn't any significant differences between education and perceived severity (p=0.336; F=1.1). Also there was significant association between having health insurance and preventive behavior's (P<0.027; F=2.2). Another finding is significant association between higher income and preventive behavior's (P<0.002; F=4.3) (Table 3).

Discussion

This study describes the knowledge, behaviors and beliefs of the women living in Hamadan city, the west of Iran related to cervical cancer and screening. Results showed relatively low level of knowledge and awareness regarding cervical Cancer and its prevention among Iranian women, which is consistent with the findings from other studies (Reis et al., 2012; Getahun et al., 2013; Morowatisharifabad et al., 2013).

According to our data, before intervention majority of both groups didn't know about signs and symptoms of cervical cancer which is consistent with the findings from Issah, et al. mentioned that all of their participants hadn't awareness of the signs and symptoms of cervical cancer (Issah et al., 2011). In this study knowledge about linkage between HPV and cervical Cancer was also low; in other word most of intervention and control group didn't hear anything about HPV virus. In the study of Wong, et al., reported that despite considerable awareness of a link between cervical cancer and sexual activity, none of the respondents had heard of the human papillomavirus (Wong et al., 2009). Additionally, according to another survey of Wong, indicated that low income and less educated participants are less likely to initiate the HPV vaccine and Respondents had low awareness about the HPV vaccine and the link between HPV and cervical cancer, but after providing information about HPV and cervical cancer, they were in favor of protection from cervical

cancer using the vaccine (Wong et al., 2009; Wong, 2009). Poor knowledge about cancer will affect women's manner to neglect Pap smear and screening services. This might be because of lack of information, education and communication regarding cervical Cancer and Cancer screening in public health programs. Many studies suggest that women with low knowledge of cervical cancer have lower rates of screening than women who have more knowledge, in the studies on the issue for example, Reis, et al., reported that women in their research had low level of knowledge and health behavior (Reis et al., 2012). Aswathy, et al., mentioned that lack of knowledge about the disease, absence of the concept of preventive behavior are important factors that prevent women from using the screening services (Aswathy et al., 2012). Specific knowledge on cervical cancer is an important factor in determining whether a woman will undergo Pap smear test or not. With increasing women's level of knowledge and correcting their wrong information, tendency to participate in cervical cancer screening will raise. In our study Educational level was an important factor associated to screening and participants who had higher level of education had more tendencies to do Pap smear test. The importance of educational status on knowledge of cervical cancer has been mentioned in many studies (Shobeiri and Nazari, 2006b; Shobeiri and Nazari, 2007; Tehranian et al., 2010). Furthermore in other survey mentioned that women with lower educational levels and lower household income were less likely to be screened (Lee et al., 2013). In our study it is considered that there were significant association between level of education and variables of HBM such as susceptibility, barriers, benefits and self-efficacy and guidance for practice but there weren't any significant differences between level of education and perceived severity. In other word women who have higher level of education have more knowledge, Preventive behaviors and more perceived susceptibility, benefits and lower barriers to take action and higher self-efficacy and guidance for practice but their perceived severity weren't dependent to level of education. It should be mentioned that after intervention we observed significant differences in all variables of HBM in intervention group and no significant differences in control group. In other word we should plan for increasing women's knowledge, perceived severity of cancer and preparing information about benefits of screening and helping to decrease barriers of taking Pap smear test. In our study, it was found out that women have a moderately high level of self-efficacy to take care of themselves. The perceived benefits of preventive health practices influence women's willingness to take preventive test such as Pap smear. We determined that those women with low-level education and low income had more negative Pap smear barriers. These results are consistent with other study (Shobeiri et al., 2006; Shobeiri and Nazari, 2006a; Reis et al., 2012; Mousavi et al., 2013; Shobeiri and Nazari, 2014) . Previous study done by Arabaci also found that women who have insufficient awareness about prevention and early diagnosis of cervical cancer almost have not fear of cancer also perceived severity was low among them that was consistent with low perceived severity in our control group (Arabaci and Ozsoy, 2012). According to Wolwa (2013) the more women perceive themselves susceptible to cervical cancer, the more likely they are to participate in screening behaviors (Wolwa et al., 2013). Also Ibekwe, et al. mentioned that women with high perceived susceptibility were 3.2 times more likely to do screening for cervical cancer than women with low perceived susceptibility (Ibekwe et al., 2010).The findings of the study about the association of the perceived barriers with tendency to do the test are consistent with the study performed by other investigators (Hajializadeh et al., 2013). According to our findings, the higher positive beliefs about perceived benefits of Pap smear test, susceptibility, seriousness and health motivation, can cause the higher participation in regular Pap smear test and the high beliefs about Pap smear barriers cause negative behaviors in having the test. Many studies have reported the predictability of the HBM on cervical cancer screening behaviors. Also our research shows that the health belief model is a useful model to understand the effective factors on applying Pap smear among Iranian women.

The findings of this study highlight the important role of education about cervical cancer on changing women's beliefs about cervical screening and motivating them to receive a screening. More educational intervention is needed to be added to strategic program of premarital classes in Iran to encourage adherence to routine cancer screening with raising women's awareness about cervical cancer before starting sexual activity. Health education, benefits and barriers-specific counseling interventions would provide an opportunity to increase cervical screening rates among Iranian women.

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