

RESEARCH ARTICLE

Using Health Belief Model Constructs to Examine Differences in Adherence to Pap Test Recommendations among Iranian Women

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Abstract

Despite documented successful Pap tests in routine care of women, screening levels are unfortunately often lower than recommended. This study aimed to assess differences in adherence to Pap test guidelines among a sample of Iranian women using the Health Belief Model (HBM). In this descriptive and analytical study, information was collected from a total of 305 women, (age range of 15-49) from Zarandieh health centers in Iran using a random multistage sampling method. The questionnaire covered demographic characteristics; health belief model constructs were gathered by a self-report method. The results were analyzed using the independent samples t test and logistic regression in SPSS-20. A total 32% of the subjects had a history of a Pap test and the score mean of the whole constructs model (knowledge, susceptibility, severity, benefits, barriers and self-efficacy) in these individuals was higher than those without a positive history. Among the predictive variables of HBM constructs, the highest weights were observed for perceived benefits $\beta=0.36$, perceived susceptibility $\beta=0.35$ and self-efficacy $\beta=0.29$. Based on our finding of positive relationships for health belief model structures with performance of a pap smear test, designing educational interventions for changing the knowledge levels and beliefs of women is recommended.

Keywords: Cervical cancer- cervical neoplasms- Health Belief Model- pap smear- women

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Introduction

Cervical cancer (CC) is one of the common health problems and leading causes of cancer deaths among women in the worldwide. Evidence has shown that there is a big disparity between developing and developed countries, where CC is the fourth most common cancer in women worldwide with an estimated 528,000 new cases each year and the second most common in developing regions with an estimated 445,000 new cases each year. In addition, of the estimated more than 270,000 deaths resulting from CC every year, more than 85% of these occur in developing countries in south and south-east Asia, sub-Saharan Africa, and South and Central America, where it is the second most common cancer among adult women (Rina Kato, Hasegawa, Torii, Udagawa, and Fukasawa, 2015).

less access to basic health care services, also effective screening approaches that the disease is often not identified until symptoms develop is resulting in a higher rate of death from CC in these countries (R Kato et al., 2010).

In India, there are 20.2 per 100,000 new cases of CC diagnosed and 11.1 per 100,000 deaths annually,

in sub-Saharan Africa, 34.8 per 100,000 women are diagnosed with CC annually and 22.5 per 100,000 women die from this disease (Allahverdipour and Emami, 2008). In Iran, CC is the fourth most common cancer among women and the fifth leading cause of cancer death in women (M Karimy, Gallali, Niknami, Aminshokravi, and Tavafian, 2012).

Although CC is the second most common cause of cancer death and a leading cause of morbidity in worldwide women. Nevertheless, most cases of CC are highly preventable and, if found early, highly curable. Because pre-cancerous lesions take many years to develop, screening is recommended for all women (Moyer, 2012). CC screening is testing for pre-cancer and cancer among women who have no symptoms. Screening can detect cancer at an early stage and treatment has a high potential for cure. Moreover, screening has dramatically reduced on CC mortality, if a high proportion of women participate (Hawkins et al., 2013). The American Cancer Society (ACS) recommend that average risk women 30 to 65 years old be screened for CC via Pap test every 2- 3 years (Roland, Benard, Greek, Hawkins, and Lin, 2016). The high mortality rate from CC globally (52%) could be

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reduced by effective screening programs. Since 1950, Pap test has been successful in reducing the incidence of CC by 79% and mortality by 70% (Roland, Greek, Hawkins, Lin, and Benard, 2015). Despite the evidence-based documents for successful of CC screening into women routine care, unfortunately, some women are screened less often than recommended (Jeihooni, Kashfi, Bahmandost, and Kashfi, 2015).

On time diagnosis in the early stages can cause disease prognosis and effective survival life. For this reason this kind of cancer is considered to be preventable (Johnson, Mues, Mayne, and Kiblawi, 2008). Significant differences in screening rates have also been found among developing and developed countries women's. These results support of psychosocial and cultural predictors of CC screening (Allahverdipour and Emami, 2008) (Allahverdipour and Emami, 2008). Previous studies showed that an individual's decision to take a healthy behavior is influenced by the following factors: knowledge, attitudes and beliefs about the efficacy of alternative actions, perceived vulnerability, and psychological barriers to action, perceived self-efficacy and interpersonal factors (Ganz, Rimer, and Lewis, 2002; Glanz, Rimer, and Viswanath, 2008).

HBM was used as theoretical framework to study consists of several basic construct forecasts, why do people act preventive action? Why following implementation of screening and how to control the status of diseases? This model primarily has been adopted on the prevention of disease and behaviors to avoid illness and disease focused chain (Glanz et al., 2008; Mahmood Karimy et al., 2016), including an important and accurate model to predict the behavior and HBM given in attempts (Jeihooni et al., 2015). The HBM was developed in the early 1950s by a group of social psychologists to exploratory and assess why persons used or failed to use medical screening programs. The constructs of HBM are derived from psychological and behavioral theory, which hypothesizes that in the context of health related behavior, an individual's intentions and behaviors depend two factors: (1) the desire to avoid illness and (2) the belief that a specific health behavior will prevent illness (Ganz et al., 2002; Glanz et al., 2008)

Assumption of the model is that persons make decisions about health behaviors according to risk perceptions and personal cost of engaging in the health behavior (Glanz et al., 2008; Mahmood Karimy et al., 2016). According to this model, one must believe that a predisposition to a disease such as CC (Perceived susceptibility) the depth of the risk and the seriousness of its effects in own life understand (Perceived susceptibility), Actions proposed to reduce the risk or severity of disease, such as Pap smear is helpful (Perceived benefits), and capability of inhibiting factors such as cost of operation, and overcome pain (Barriers) (M Karimy et al., 2012) {Glanz, 2008 #45}. Although the Pap smear test in Iran health system has begun since 1992, it is an effective and inexpensive testing in screening for cervical cancer (Karimi, Shamsi, Araban, Gholamnia, and Kasmai, 2012). However, various studies (Allahverdipour and Emami, 2008; Jeihooni et al., 2015; M Karimy et al., 2012) indicated that screened less often

than recommended. This study aimed to assess differences in adherence to Pap test among Iranian women using the health belief model construct.

Materials and Methods

This study is a cross-sectional study that Statistical Society of 305 women was covered by health centers Zarandieh. Sample size considering the accuracy of 5% and 95% confidence level and the level of knowledge (78%) derived from previous similar studies (4) and this formula calculated. The inclusion criteria was married women that passed at least 6 months from their marriage and exclusion criteria was included not wishing to participate in the study and informed consent. In this study, sampling so that the first phase of all urban health centers in the city that were homogeneous population covered cultural characteristics, randomly 4 center was selected. After health centers had been determined, the quota any center from the sample to be determined based on ratio of the number women's in each center. 3) The women's were randomly selected from each center based on number of households in family file.

The data collection tool that questionnaire derived from the literature (Fernández et al., 2009; Jeihooni et al., 2015; Karimi et al., 2012; M Karimy et al., 2012) designed was according to interview (In people with low literacy or illiteracy) and self-report was completed. The questionnaire was set in four sections. The first part consists of 5 questions related to demographic characteristics, the second part of the question 12 of the three options (yes, no, do not know) in the field of knowledge. The third part consists of 28 questions on the HBM (Benefits and barriers 12 questions, Susceptibility and severity of 10 questions and self-efficacy 6 questions). The HBM constructs was measured using five-point semantic differential scales, ranging from 0 (strongly agree) to 4 (strongly disagree). Part forth 2 open questions about the reasons for doing and not doing a pap smear test. The fifth section is the checklist test which can be done or not done that it was the office of midwifery and family health center. Rate of questioner was according to knowing and without knowing answer and the score which was given to correct and wrong answer was 1 and 0 respectively. To assess the validity of questioner, the method of content validity was used. Thus, the questionnaire based on HBM and according to scientific sources of supply and then the ten professors of nursing, midwifery and health education of Hamedan University, Saveh and Arak University of Medical Sciences was laid.

Bugs and ambiguities in the questionnaire were modified according to their comments, and its validity was confirmed. To assess their reliability of the questionnaire through Cronbach's alpha test and implementation of test on the 15 mothers of the study population which had similar demographic characteristics. Cronbach's alpha coefficients were good for all of variables (knowledge=0.87, Perceived Benefits=0.80, barriers=0.86, Susceptibility=0.79, severity=0.84, and self-efficacy=0.86). were measured which the value of the knowledge questions and in the health belief model construct 87% and 82% acquired

respectively.

To complete the questionnaire, the research team during a phone call, with their introduction and aims of the study to the samples to the health center invited and after obtaining the written consent completed the questionnaire. Also refer to the lack of sample takers to the center and their willingness to participate in the study, the research team visit sample taker home in the process of completing the questionnaire. To any minute 45 took complete the questionnaire. Analysis of data used SPSS software and method of descriptive statistics which including absolute and relative frequency distribution for reasons or lack of testing and analysis statistic as independent samples T test for comparison, the average knowledge score and the average score of health belief model construct in individuals history, performing or not performing of pop smear test and logistic regression to determine the variables that were associated with testing.

Results

The mean age of participants in study was 33.88 (SD= 0.84), and age group of 35-44 years with 131 people (43%) and middle and secondary level of education with

119 people (39%) were the most frequent. Family size of the participation was 3.47. Also 84% of samples were housewife and 297 people (98%) were also covered by insurance services (Table 1). In this study the mean score of knowledge for people with a history test 8.83 and those without a history test was 6.02 and independent samples t-test has a significant difference between average score of individual knowledge with and without implementation history of test showed ($p < 0.001$). To examine the relationship between demographic variables age, and level of education with an average score of Knowledge and health belief model construct one way ANOVA was used which the relationship between knowledge and construct model with demographic variables were noticeable. Also using in dependent t-test a significant difference between the mean score of knowledge and health belief model construct with the employment and insurance situation of people with not observed.

In this study, 32% of the subjects had a history test and the score mean of whole constructs model (knowledge, susceptibility, severity, benefits, barriers and self-efficacy) in individuals with a history test was higher than those without a history test. Data analysis using independent t test and the significance difference between the average

Table 1. Distribution of Mean and Standard Deviation and the Model Structures Score of HBM Based on Demographic Variable

Variable	number	Knowledge	Susceptibility	Severity	benefits	Barriers	Self-efficacy
Age							
15-24	54	8.1 (1.5)	9.8 (2.1)	10.1 (1.9)	13.4 (2.9)	13.4 (3.2)	12.5 (2.1)
25-34	90	8.2 (1.0)	9.5 (2.1)	10.8 (2.0)	13.7 (3.2)	13.1 (3.1)	12.8 (1.8)
35-44	131	8.1 (1.1)	10.0 (2.5)	10.1 (1.9)	12.9 (3.5)	13.2 (3.4)	11.9 (2.1)
≥45	30	8.0 (1.1)	9.6 (2.1)	9.9 (2.1)	13.1 (3.2)	12.9 (3.2)	12.2 (1.9)
Literacy							
Illiterate and elementary	29	8.1 (1.3)	9.2 (2.1)	10.1 (2.2)	12.8 (2.9)	13.2 (2.8)	12.1 (1.9)
middle and secondary	119	8.1 (1.5)	9.4 (2.5)	10.4 (1.9)	13.3 (2.7)	13.1 (2.6)	11.8 (1.7)
diploma	116	8.2 (1.1)	9.3 (2.2)	10.7 (2.1)	13.2 (2.8)	12.8 (3.1)	12.2 (2.1)
Collegiate	41	8.3 (1.2)	9.6 (2.6)	10.9 (2.7)	13.5 (3.1)	12.9 (3.5)	12.3 (2.2)
Employment							
yes	49	9.1 (1.2)	9.7 (2.5)	10.0 (2.8)	13.6 (2.7)	12.7 (3.0)	12.4 (1.8)
No	256	8.9 (1.6)	9.2 (2.9)	10.4 (2.1)	13.4 (2.5)	13.2 (2.8)	12.0 (1.3)
insurance							
yes	298	8.5 (1.3)	9.6 (2.2)	10.3 (2.6)	13.1 (3.1)	12.6 (2.9)	12.7 (1.6)
No	7	8.4 (1.7)	9.4 (2.7)	10.1 (2.5)	12.9 (2.3)	13.0 (2.2)	12.2 (1.2)

Table 2. The Mean HBM Model Structures in Individuals with a History of or Failure to Perform Pap Tests

The significance level	Total		People with history pap smear		People without history pap smear		p.value
	Total	Mean (SD)	N	Mean (SD)	N	Mean (SD)	
knowledge	305	7.5 (1.4)	97	8.8 (1.6)	208	6.0 (1.4)	0.001
Susceptibility	305	8.9 (2.2)	97	10.0 (2.7)	208	7.4 (2.1)	0.001
Severity	305	10.3 (2.3)	97	12.3 (2.4)	208	8.9 (2.3)	0.001
Benefits	305	13.4 (2.8)	97	16.0 (2.9)	208	10.8 (3.2)	0.001
Barriers	305	12.5 (2.7)	97	9.2 (2.5)	208	15.7 (2.6)	0.001
Self-efficacy	305	11.5 (1.8)	97	14.2 (1.9)	208	8.7 (1.6)	0.001

Table 3. Results of the Multiple Logistic Regression Analysis

variables	OR	95%(CI)	P
benefits	0.36	0.25-0.49	<0.05
susceptibility	0.35	0.23-0.44	<0.01
self-efficacy	0.29	0.17-0.38	<0.05
barriers	0.22	0.12-1.1	<0.18
knowledge	0.19	0.10-0.32	<0.05
severity	0.18	0.06-1.0	<0.11

score of all constructs in individuals with a history of or failure to perform HBM test showed (Table 2).

As Table 3 displays, the most important testing reasons for people who had done the test in order of importance were: recommended health personnel (62%), recommended friends and Relatives (59%) and recognition on time uterine problems (57%) and in those who had not undergone a pop smear test, perceived low susceptibility (81%), lack of knowledge of the importance of the test (68%) and fear of test results (48%) which was the main reasons of the test.

To evaluate the predictive rate of different variable for the implementation of Pap smear test from the regression analysis was used and showed the variable of age, education level, knowledge and health belief model constructs for a total of 34. 2 % of the variance test explains behavior. Among these predictive variable of knowledge, self-efficacy, benefits and perceived susceptibility were significant and variable benefits =β) 0.36), perceived susceptibility =β) 0.35), self-efficacy =β) 0.29) had the most predictive rate and barriers variables=β) 0.22), knowledge=β) 0.19), and severity =β) 0.18) were next in the ranking. As table 5 shows the main barriers in the view of participants of this study fear resulting test, misconception about health, illness and difficulty of the test is.

Discussion

The major focus of this study is to investigate the relationship between health belief model constructs with the performing of Pap smear test and found that these constructs accompany with variable of age, level of education and knowledge in total 34.2% of variance behavior test explained. This finding is consistent with the Jeihooni study in diabetic patients that explained the constructs model was enable 35%% of the variance in Pap test behavior (Jeihooni et al., 2015). According to Cooper et al, health belief model for assessment of screening behavior among Asians have the more application than other models. Because there are a positive correlation between the constructs of model and the intended behavior (Cooper, Loue, and Lloyd, 2001). In this study 32% of the samples had a history of testing that the low level can be obtained by examining the average score of health belief model constructs explained. In the section of perceived benefits about the test that the most important predictor for implementation of Pap test was in the part of research. The mean score of those with a history test was

Table 4. Reasons of Pap Smear Testing or not Testing

Reasons of testing	%	reasons not testing	%
Recommended health personnel	62	I am not prone to cancer	81
Advise of friends and Relatives	59	lack of awareness of the importance of the test	68
The use of tablets and ampoules contraception	49	Fear of finding cancer test results	48
Early detection and timely uterine problems	48	Young	36
vaginal tract diseases	41	No certain reason	48
No certain reasons	39	Natural method of contraception	25

16 and those without a history test was 10 of 24 which this shows the importance of people’s perception of the benefits of a screening program is to use it. This subject in the attraction of participation people in screening programs of this kind should be considered. In checking of reason for performing or not performing of the test 48% of participations tested due to early detection and on time uterine problems cited. Looking at the results of the analysis of the perceived benefits, the most important perceived benefits by research units in order of importance can be role of Pap smear test in early detection and treatment of cervical cancer, easily test and inform the person of his health status noted. Similarly, A study by Hayden, showed, women who perceive a benefit from Pap test (i.e. early detection) are more likely to engage screening than those who do not see the screening as having a benefit (Hayden, 2009). Johnson et al, reported, the benefits of CC screening perceived by U.S. Hispanic women include early detection of cervical cancer, reassurance that one does not have cancer, and the belief that Pap smears decrease the risk of CC and prolong life (Johnson et al., 2008).

Consistent with previous study (Arredondo, Pollak, and Costanzo, 2008; Parra-Medina et al., 2009; Watts et al., 2009) our finding showed women with higher scores on the perceived barriers for CC screening were less likely to have ever had a Pap smear than participations with more scores. Also Some of Perceived barriers have been described include not knowing about the importance of Pap testing, accessibility, time constraints, forgetting to schedule a Pap test, and embarrassment. Similarly, a study by Fernandez-Esquerand Cardenas-Turanzas, showed that access to health care was a significant barrier to Pap test (Fernández et al., 2009).

In this study, the most important reasons for lack of testing are susceptibility to infection. In other words, perceived susceptibility was low. So that the mean score for perceived susceptibility to CC was 8.9 from 20 which reflects the perceived susceptibility is low in research units. Looking at the results of this analysis can be seen that only 19% of subjects at risk for CC found and the rest were for reasons like being young and not using hormonal methods of contraception was not in danger. In this study the perceived susceptibility was as the a important factor of predictive for performing Pap test which this issue

should be considered for testing planned training and consultation. Researchers believe to motivate people to take action specific health, one must know the potential influence of the uncomfortable, or are affected by it is (Zareban, Karimy, Niknami, Haidarnia, and Rakhshani, 2014). Health educators should be followed by the risk of negative consequences and to highlight risks for clients to create their perceived susceptibility.

The present study indicated that sensitivity variable was not significant factor in predicting for Pap test. This result is in agreement with the results of a study in Tanner-Smith and Brown which showed that the perceived severity was weakest predictor of Pap test (Tanner-Smith and Brown, 2010).

In our study the mean score of severity in people with a history test was higher than those without a history test and 89% of CC diagnosed untreatable and 81% saw it as deaths. These beliefs should be considered for testing and counseling programs because these beliefs create fear and anxiety in people to participate in the screening program. The findings of this study, the relationship between sensitivity construct with the pap test in women of Ghana (Abotchie and Shokar, 2009), and Barata in Canada (Barata, Mai, Howlett, Gagliardi, and Stewart, 2008) correspond.

Previous studies found a positive association between high perceived self-efficacy and pap test (Arredondo et al., 2008; Johnson et al., 2008), for instance, Arredondo et al., showed that women who believed in their ability to overcome barriers in attaining Pap test were more likely to engage in this behavior (Arredondo, Pollak, and Costanzo, 2008). Similarly, participations in our study, with higher scores on the self-efficacy were more likely to have ever had a Pap smear than participations with low scores. An important subject in not performing certain health prevention methods is the fear of being unable to perform them correctly. Self-efficacy refers to an individual's belief in his or her capacity to perform behaviors necessary to produce specific performance attainments (Karimy et al., 2016).

In this study, people with history test had higher knowledge score which this finding with the study of Barati et al (Barati et al., 2016) among Iranian men and study of Selvin (Selvin and Brett, 2003) as well as Katz (Katz and Hofer, 1994) in American women is conformity while the study of Halroed in China women is inconsistent. The mean knowledge score 7.5 of 12 was the indicative good relatively knowledge of research units. In the study of Lee in American-Korea women (Lee, 2000) and study of Wang in Malasia (Wong, Wong, Low, Khoo, and Shuib, 2009) the rate of knowledge of women in case of Pap smear test was low which inconformity with the our study.

There are few limitations that should be considered in the interpretation of these findings. First, the analysis was based on cross-sectional data; thus, causal relationships could not be inferred. The study participants were recruited from public health centers. Therefore, interpretation of the results to the general population in Zandieh must be made with caution may not represent the overall women population.

In conclusion, based on this finding and the positive

relationship HBM structures with performing of Pap test, designing educational interventions for changing the knowledge and beliefs of women is recommended. In addition to raising knowledge, to factors such as increased susceptibility and perceived benefits of the Pap test and to identify barriers to Pap test and to develop interventions that reduce barriers. Health workers and policy makers working with women need to recognize the importance of psychological factors which can be used to design appropriate cervical cancer screening programs.

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