

RESEARCH ARTICLE

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Assessment of Preventive Behavior for Cervical Cancer with the Health Belief Model

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Abstract

Introduction: Cervical cancer is a leading cause of death in developing countries. However, taking regular Pap smears screening, one of the most effective screening tests, can reduce chance of cervical cancer remarkably. The first step in health education is choosing the right model, one of the best known being the Health Belief Model (HBM). Here, we evaluated different HBM factors with regard to cervical cancer preventive behavior in Fasa, Iran. **Materials and methods:** This cross-sectional study included 200 married women between the ages of 17 and 64 in Fasa during 2013. Participants were selected through stratified sampling from urban health centers. The questionnaire of the HBM included four sections and was filled out by interview. Data analysis was with SPSS 21, ANOVA and t-tests and Internal correlations between components of model were analyzed in terms of the Spearman Pearson correlation coefficient. **Results:** The mean age of the participants was 35.6±9.89 years. Some 52% had undergone a Pap test. The percentage values for participants' knowledge and perceived susceptibility were 49.5% and 46%, respectively, considered as moderate. Perceived severity and benefits were good at 56.5% and 73%, respectively, while perceived barriers was moderate (46.5%). Also, 57.1% demonstrated a good self-efficacy and 61% good behavior. **Discussion:** We found that the most predictable factors for knowledge and behavior were age, income level, perceived benefits, perceived severity and self-efficacy according to the HBM. These factors should be taken into account for achieving acceptable preventive behaviors in health programs.

Keywords: Cervical cancer- health belief model- knowledge- Pap smears

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Introduction

Cervical cancer is a leading cause of death due to cancer in developing countries (Haghshenas et al., 2013). Cervical cancer has the highest mortality rate in these countries among all other cancers (Jalalvandi and Khodadoostan, 2005). Research has shown that approximately 440 000 people are diagnosed with cervical cancer each year, 80% of which live in underdeveloped countries (Wong et al., 2009). Asia, Africa, Latin America and Caribbean are the most prevalent areas in cervical cancer. Almost 86% of all global cervical cancers are diagnosed in these areas (Vaccarella et al., 2017). However; in developed countries like the United States, mortality rate of cervical cancer has dropped about 90% due to awareness of cervical cancer and Pap smear (Wong et al., 2009). Therefore, due to the differences between the knowledge of and the participation in performing Pap smear screening, prevalence of cervical cancer is different from place to place (Jalalvandi and Khodadoostan, 2005). The top five Cancers among Iranian women who are located in Tehran metropolis region during 1998-2001 were breast cancer,

stomach cancer, lung cancer, ovarian cancer and esophagus cancer. The age-standardized rates (ASR) for each of them turned out to be 31.4, 10.0, 7.0, 6.8, 5.3 per 100,000 people respectively. The ASR for cervical cancer was 4.8 (Mohagheghi et al., 2009). The another research about incidence rate of cancers in Ardabil, Iran during 1996-1999 has estimated ASR for each cancers and the most prevalent ones were stomach cancer (25.4) with highest rate following esophagus cancer (14.4), breast cancer (7.6), colon and rectum cancer (5.9) and lung cancer (3.6). This amount was only 0.4 for cervical cancer (Sadjadi et al., 2003). There is a research about all cancers incidence among women in Iran which has performed in 2012 and dedicated the highest ASR to breast cancer which was 28.1. The other most common cancers were colorectal and stomach cancer with ASR 10.5 and 9.7. The ASR for Cervical cancer was only 2.8 but the five-year prevalence ratio for cervical cancer will significantly increase to 9.1 per 100,000 (Mohebbi et al., 2018). The prevalence of the cervical cancer in Iranian women is 2.5per 100,000 according to data from national cancer and registration data (Khorasanizadeh et al., 2013).

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Studies has indicated that human papillomavirus (HPV) infection is responsible for cervical cancer in more than 90% of the cases worldwide which is associated with precancerous lesions. Cervical cancer affects a wide range of ages, however, the majority of the cases were either 35-39 or 60-64 years old according to a study by (Krivak et al., 2002). Like the other cancers, cervical cancer has several risk factors such as having multiple sexual partners, smoking, early age at first sexual intercourse and early pregnancy, multiparity and low personal hygiene (Krivak et al., 2002).

Cervical cancer can be easily diagnosed in women who are experiencing symptoms like unusual and malodorous discharge, abnormal vaginal bleeding (menorrhagia and metrorrhagia), also post-coital bleeding in menopausal women (Krivak et al., 2002). Pap smear is one of the most effective screening tests for early diagnosis of cervical cancer (Baghyani Moghaddam, 2003). In addition to Pap test, nutrition factors like a diet rich in vitamin A, C and folic acid, hygiene of the genitalia, visiting a doctor if symptoms have presented and respecting ethical principles are also included in the preventive methods (Namdar et al., 2012). Although the benefits of a Pap smear test are undeniable, a large number of women have not ever performed this test on a specified period (Kim et al., 1999). Regular Pap smear screening will reduce the chances of cervical cancer remarkably. Pap smear test has been recommended to be performed once a year for three years, then every three years if the first three ones were negative. Although not performing the test on the mentioned times will increase the risk of malignancy two to six times (Namder et al., 2012; Krivak et al., 2002). Assessment of cost-effectiveness of cervical cancer screening during 2004-2007 in Kermanshah, Iran showed that it would be better to do screening after the age of 35 years old (Nokiani et al., 2008). Also another research in Cantabria in Spain recommended doing screening every 5 years (Ramos-Barron et al., 2014). In Taiwan, performing Pap smear is the best method for screening (Chen et al., 2011). There are some barriers which avoid women from performing Pap smear. These barriers are lack of knowledge, fear from cancer diagnosis, inappropriate beliefs and pain toward the procedure (Shakibazaeh et al., 2008). The most well-known barriers on doing Pap smear in southern Iran were lack of time, crowded health care centers, fear of cancer, negative familial history, absence of any symptoms, expensiveness of procedure, having shame, lack of knowledge, not receiving suggestion from doctors respectively (Namdar et al., 2012).

Several factors have caused a decrease in the number of women referring to doctors for Pap smear screening such as lack of knowledge and awareness about cervical cancer and Pap smear, being afraid of the pain due to the procedure, lack of staff and health centers, fear of abnormal results and misunderstandings about the process of the test (Fylan, 1998). In each program, the first step for health education is choosing the right pattern. One of the most known patterns in health education is the Health Belief Model (HBM), the validity of this model has been proven (Guvenc et al., 2011). The Health Belief

Model is a comprehensive questionnaire which helps physicians to prevent the diseases. Besides, the basis of this model is encouraging the participants to take part and increasing their awareness women which creates acceptable behavior. Feeling the threatening risk of cervical cancer (perceives susceptibility) is the first step for preventive action. Afterwards, the intensity and life threatening complications of the cancer (perceived intensity), receiving positive signs from surroundings and positive symptoms of cancer (manual operation), believing in accuracy and the benefits of the preventive programs (perceived benefits) and the inhibitory factors of accurate behavior which have less importance than its advantages (perceived hindrance) and finally performing preventive behavior, which has been summarized in Figure 1 (Namdar et al., 2012).

In spite of several studies that have investigated the awareness of woman about Pap smear screening, the number of cervical cancer patients and its mortality rates are significant. In addition to financial costs and psychological effects, cervical cancer is a life-threatening disease. In fact, lack of awareness, poor health behavior, low socio-economic status, low education rates among women in rural areas like Fasa call for an improvement in knowledge and screening of women in preventive programs. Consequently, we evaluated different factors of HBM in preventive behavior of cervical cancer in Fasa, Iran.

Materials and Methods

This study was a cross-sectional experiment. The sample size was determined according to the previous study which indicated a public knowledge of 63% among the participants (Namdar et al., 2012). Also, type I error was considered as 0.05, the power of test was considered as 80% and precision was 10%. According to the aforementioned criteria, the sample size was calculated as 185 women by including a 10% drop. As a result, this study included 210 married women at the ages of 17 to 64. The participants were either married, widowed or divorced at the time of the study. They were all living in Fasa in 2013. The exclusion criteria were women with previous history of cervical cancer. At last, the sample size was 200 women. Sampling was stratified and had two stages. First, Fasa health centers were divided into 10 regions. Then, 21 women were selected from each region by systematic sampling.

The questionnaire of the HBM contained 4 parts. The validity of the questionnaire was proven by the previous study (Namdar et al., 2012). Interview was chosen as a method to complete the questionnaires. The interviewers were first trained and taught how to collect data and complete the questionnaires. They were then assigned to different locations to perform the study.

The data were presented as Mean value and Standard deviation (SD) and analyzed by IBM SPSS version 21 (IBM SPSS Inc, Chicago ILL). Relationships between the demographic characteristics and the model components were analyzed by ANOVA and t-tests. Internal correlation between the components of the model was analyzed by

Pearson correlation coefficient. Behavior was predicted by stepwise multiple regression in two phases. In the first phase, the variables of the components of HBM were analyzed to predict the patient's behavior. In the second phase, all the studied variables of the model along with the awareness and demographic characteristics were chosen for predicting the behavior.

Results

According to our results among 200 women in Fasa, south of Iran, the mean age of the participants was 35.58±9.89, the marriage age was 21.26±4.63, the age at first pregnancy was 22.79±4.87, the mean value of the parity was 2.29±1.65, The mean value of the age of the first pap smear was 26.89±3.96 and the mean number of the previous pap smear tests performed on the individual was 1.72±2.45. 187 (93.5%) of the participants were married and 6.5% were unmarried either divorced or widowed. Only 24% of the women were employed. 152 (76%) of the participants were housewives. Regarding education levels, 36.5% did not have a high school diploma, 38.5% had a high school diploma and 28% of the participants had a university degree. Also, their husbands' education levels were as follows; 42% with no high school diploma, 28.5% with a high school diploma and 29.5% with a college degree. 51.5% (103) of the subjects were taking contraceptive pills. 80% of the respondents had insurance. 52% (104)

of the women had a previous history of performing Pap smear test for screening. The number of non-smokers was 184 (92%). In addition, 14.5% (29) of the participants reported positive familial history or past medical history of cervical disease. The frequency of women with low income level (under 50\$) was 41.5%.

The percentage of women's knowledge and perceived susceptibility was 49.5% and 46%, respectively, which was considered as moderate level. Perceived severity and benefits were as high as 56.5% and 73%, respectively; while perceived barrier was moderate (46.5%). 57.1% of the participants had shown a good self-efficacy. Finally, 122 respondents (61%) had a good behavior. The detailed characteristics are summarized in Table 1.

As described in Table 2, there was a significant relationship between knowledge and the educational level of women and their spouses described as $p < 0.001$. Non-smokers had significantly more knowledge about Pap-smear ($P = 0.009$). A positive history of having a previous Pap smear test showed a significant correlation with all the structures of the Health Belief Model (HBM) except for women's behavior ($P = 0.066$). The women who were employed had a significantly higher awareness ($p = 0.001$), perceived severity ($p = 0.012$) and perceived susceptibility ($p = 0.003$). Behavioral patterns also correlated with women's employment, their spouses' educational level, insurance and smoking. The detailed features were particularly demonstrated in Table 2.

We compared the correlation coefficient factor

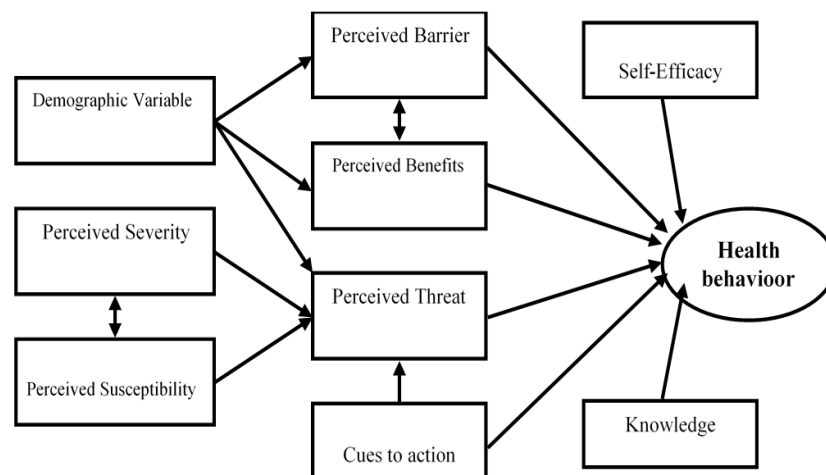


Figure 1. Hypothetical Health Belief Model of Women's Behavior in Cervical Cancer

Table 1. Overview of Knowledge, Behavior and Health Belief Model Components

	Range	Cronbach's Alpha	Mean	SD	low	Moderate	Good
knowledge	(0-15)	0.907	7.69	3.51	45 (22.5%)	99 (49.5%)	56 (28.0%)
susceptibility	(0-28)	0.852	15.36	6.61	38 (19.0%)	92 (46.0%)	70 (35.0%)
Severity	(0-20)	0.838	13.08	4.50	19 (9.5%)	68 (34.0%)	113 (56.5%)
Benefits	(0-32)	0.934	23.32	6.82	10 (5.0%)	44 (22.0%)	146 (73.0%)
Barriers	(0-48)	0.880	17.05	8.84	102 (51.0%)	93 (46.5%)	5 (2.5%)
Self-efficacy	(0-32)	0.863	22.24	5.90	5 (2.6%)	77 (40.3%)	109 (57.1%)
Cues to action	(0-11)	0.874	3.29	3.29	120 (60.0%)	56 (28.0%)	24 (12.0%)
					bad		Good
Behavior	(0-6)	0.746	4.51	1.69	78 (39.0%)		122 (61.0%)

Table 2. Association between Demographic Factors and Health Belief Model Components

	Knowledge			Self-efficacy			Severity			Susceptibility			Barriers			Benefits			Behavior			Cause of action			
	Mean	SD	P-value	Mean	SD	P-value	Mean	SD	P-value	Mean	SD	P-value	Mean	SD	P-value	Mean	SD	P-value	Mean	SD	P-value	Mean	SD	P-value	
Marriage	Married	7.73	3.49	0.522	22.38	5.68	0.177	13.16	4.51	0.310	15.32	6.7	0.783	17.05	8.75	0.983	23.47	6.62	0.238	4.53	1.68	0.434	3.24	3.20	0.374
	Single	7.09	3.84		19.91	8.81		11.85	4.39		15.85	5.41		17	10.55		21.15	9.29		4.15	1.91		4.08	4.55	
Occupation	Housewife	7.25	3.46	0.001	21.78	5.93	0.055	12.63	4.59	0.012	14.59	6.59	0.003	17.24	8.86	0.583	23.01	6.86	0.266	4.34	1.73	0.012	3.09	3.24	0.131
	Employee	9.09	3.33		23.68	5.64		14.5	3.91		17.79	6.15		16.44	8.84		24.27	6.65		5.04	1.46		3.92	3.41	
Education	<dip	6.18	3.46		19.87	5.86		12.11	4.47		13.25	6.71		18.41	9.75		21.63	7.85		3.93	1.87		3.03	3.46	
	Dip	7.93	3.09	<0.001	22.66	6.21	<0.001	12.68	4.52	0.002	15.08	6.38	<0.001	16.54	8.42	0.239	23.14	6.16	0.003	4.54	1.56	<0.001	2.93	3.12	0.099
	>dip	9.36	3.29		24.57	4.4		14.84	4.06		18.45	5.63		15.93	8.02		25.73	5.41		5.23	1.31		4.09	3.21	
Spouse education	<dip	6.54	3.79		20.37	5.69		11.88	4.24		13.96	6.71		17.99	9.61		22.14	7.55		3.98	1.91		3.00	3.47	
	Dip >dip	7.98	2.93	<0.001	22.41	6.31	<0.001	13.28	5.26	0.002	14.37	6.19	<0.001	16.16	7.82	0.431	23.42	6.41	0.060	4.74	1.48	<0.001	3.63	3.34	0.524
Contraceptive pills	No	9.04	3.11		24.56	4.93		14.58	3.56		18.29	6.02		16.58	8.65		24.88	5.8		5.05	1.31		3.37	2.99	
	Yes	7.55	3.51	0.576	21.57	6.32	0.128	13.23	4.41	0.645	13.81	6.44	0.001	17.78	8.25	0.256	22.85	6.98	0.346	4.37	1.89	0.261	2.92	3.01	0.121
Insurance	Yes	7.83	3.52		22.86	5.45		12.93	4.61		16.81	6.48		16.36	9.36		23.76	6.66		4.64	1.47		3.64	3.52	
	No	7.62	3.58	0.884	20.05	5.86	0.009	12.88	4.64	0.754	14.5	6.52	0.362	19.38	9.56	0.063	22.13	7.37	0.218	3.98	1.98	0.025	3.15	3.36	0.765
Pap-smear history	Yes	7.71	3.5		22.8	5.8		13.13	4.48		15.57	6.64		16.47	8.59		23.61	6.66		4.64	1.59		3.33	3.29	
	No	6.36	3.81	<0.001	20.64	5.59	<0.001	12.15	4.45	0.005	14.22	6.47	0.019	20.06	8.89	<0.001	21.95	6.91	0.006	4.28	1.74	0.066	2.86	3.49	0.079
Positive familial history or past medical history of cervical disease	Yes	8.92	2.69		23.68	5.82		13.93	4.4		16.4	6.6		14.27	7.87		24.58	6.51		4.72	1.63		3.68	3.07	
	No	7.62	3.52	0.488	22.66	5.64	0.018	12.75	4.53	0.014	15.20	6.57	0.419	16.96	8.98	0.725	23.16	6.97	0.430	4.56	1.68	0.357	3.13	3.19	0.093
Smoker	No	8.11	3.46		19.86	6.82		14.97	3.91		16.28	6.93		17.59	8.12		24.24	5.82		4.24	1.79		4.24	3.76	
	Yes	7.88	3.46	0.009	22.5	5.72	0.047	13.22	4.49	0.130	15.58	6.54	0.101	16.74	8.8	0.098	23.67	6.73	0.011	4.65	1.61	<0.001	3.37	3.32	0.248
Low income	Yes	5.51	3.49		19.44	7.2		11.44	4.41		12.75	7.09		20.56	8.83		19.19	6.63		2.88	1.78		2.38	2.94	
	No	8.2	3.34	0.015	22.9	5.99	0.062	13.37	4.34	0.276	16.47	6.3	0.004	17.3	8.69	0.637	23.57	6.64	0.527	4.68	1.57	0.101	3.26	3.28	0.865
	Yes	6.98	3.64		21.28	5.66		12.66	4.71		13.78	6.77		16.7	9.1		22.95	7.08		4.28	1.84		3.34	3.34	

Table 3. Correlation between Demographic Features and Health Belief Model Structures

		Age	Marriage age	Age in first pap-smear test	Primary gravid-age	Parity	Pap-smear tests
Knowledge	R	0.182	0.274	0.025	0.239	-0.012	0.354
	P-value	0.010	<0.001	0.920	0.001	0.865	<0.001
Self-efficacy	R	-0.027	0.197	0.137	0.242	-0.118	0.354
	P-value	0.706	0.006	0.587	0.001	0.103	<0.001
Severity	R	0.121	0.137	-0.198	0.049	-0.026	0.273
	P-value	0.087	0.053	0.416	0.514	0.715	<0.001
Benefits	R	0.073	0.127	-0.081	0.079	0.014	0.272
	P-value	0.301	0.073	0.742	0.293	0.842	<0.001
Barriers	R	0.044	0.031	-0.089	-0.013	0.02	-0.306
	P-value	0.539	0.668	0.718	0.861	0.774	<0.001
Susceptibility	R	0.152	0.160	0.162	0.137	0.015	0.149
	P-value	0.032	0.024	0.508	0.069	0.828	0.050
Cues to action	R	0.158	0.160	0.358	0.068	-0.035	0.073
	P-value	0.026	0.024	0.133	0.364	0.622	0.342
Behavior	R	-0.039	0.204	0.010	0.178	-0.113	0.234
	P-value	0.586	0.004	0.969	0.017	0.111	0.002

Table 4. Intercorrelation between Health Belief Model Components

		Knowledge	Self-efficacy	Susceptibility	Severity	Benefits	Barriers	Cause of action	behavior
Knowledge	R		0.393	0.373	0.319	0.489	-0.269	0.367	0.499
	P-value		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Self-efficacy	R	0.393		0.308	0.24	0.456	-0.395	0.174	0.465
	P-value	<0.001		<0.001	0.001	<0.001	<0.001	0.016	<0.001
Susceptibility	R	0.373	0.308		0.35	0.347	-0.011	0.284	0.293
	P-value	<0.001	<0.001		<0.001	<0.001	0.877	<0.001	<0.001
Severity	R	0.319	0.24	0.35		0.384	0.107	0.160	0.108
	P-value	<0.001	0.001	<0.001		<0.001	0.132	0.024	0.126
Benefits	R	0.489	0.456	0.347	0.384		-0.097	0.164	0.566
	P-value	<0.001	<0.001	<0.001	<0.001		0.171	0.021	<0.001
Barriers	R	-0.269	-0.395	-0.011	0.107	-0.097		-0.084	-0.197
	P-value	<0.001	0	0.877	0.132	0.171		0.236	0.005
Cues to action	R	0.367	0.174	0.284	0.160	0.164	-0.084		0.181
	P-value	<0.001	0.016	<0.001	0.024	0.021	0.236		0.010
Behavior	R	0.499	0.465	0.293	0.108	0.566	-0.197	0.181	
	P-value	<0.001	<0.001	<0.001	0.126	<0.001	0.005	0.010	

between some of the demographic features and the HBM components to determine the positive and negative correlations among the aforementioned factors. All the data are indicated in Table 3. A positive correlation was obtained between marital age and the other HBM components. Self-efficacy and behavior had negative correlation with the participants' current age ($r = -0.027$, $r = -0.039$). As a matter of fact, the current age did not predict the women's behavior ($p = 0.586$). Both correlation coefficient and P value showed that the timing of the Pap smear tests had a positive correlation with all the features except for the perceived barriers ($r = -0.306$). Also, High parity had a negative impact on behavior ($p = 0.111$ and $r = -0.113$).

As this is shown in Table 3, cues to action had a significant correlation with the participant's age

and marital age. Intercorrelation between the HBM components and their correlation with behavior and knowledge of the participants have been summarized in Table 4.

The participants were asked about cues to action which can provide all necessary information through prophylaxis, symptoms, diagnosis and treatment of cervical cancer. The most beneficial cues to action were television programs (56%), health care workers (51.3%) and doctors (50.8%) while websites and satellites had the lowest percentage, 19.7% and 15%, respectively.

The first phase of regression analysis revealed that the most predictive factors in women's behavior were perceived benefits ($P\text{-value} = 0.001$), perceived severity ($P\text{-value} = 0.04$) and self-efficacy ($P\text{-value} = 0.01$). The second phase of regression analyzed all

Table 5. Regression Model Results to Predict Behavior According to all Variables

	Regression coefficient (β)	Standard	t	p-value
Regression constant	2.727	0.810	3.366	0.001
Knowledge	0.111	0.034	3.282	0.001
Self-efficacy	0.059	0.019	3.163	0.002
Severity	-0.084	0.024	-3.504	0.001
Benefits	0.068	0.020	3.424	0.001
Age	-0.023	0.010	-2.255	0.025
Low income	-1.206	0.332	-3.634	<0.001

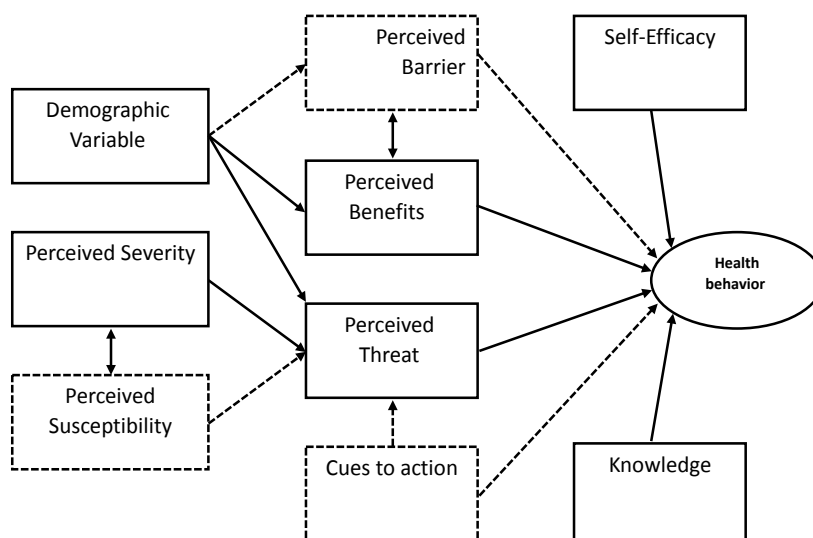


Figure 2. Final Health Belief Model of Women's Behavior in Cervical Cancer

the demographic features to predict behavior. This concluded that knowledge (P=0.001), self-efficacy (P =0.002), perceived severity and perceived benefits (both P=0.001), age (P=0.025), low income (P<0.001) can be considered as the final predictors of women’s behavior who participated in our study (Table 5). The final HBM has been described in Figure 2.

According to the data that was presented in Table 2, knowledge in women with positive experience of Pap smear test were higher than others (P<0.001). Nevertheless, correlation between knowledge and behavior in them (r = 0.458, p < 0.001) was same as women without experience of Pap smear test (r = 0.450, p < 0.001). So all women were included in the regression analysis.

Discussion

HBM, as a highly well-known structure, has been widely used in researches. It has also been used for its preventive benefits in incident of some diseases. As it can be inferred from the results, this study was done to improve women’s knowledge and awareness of cervical cancer which leads to preventive behavior.

We observed that only 28% of women had good knowledge about Pap smear. A previous study conducted in Tehran, Iran found this knowledge to be at 47.8% among its subjects (Hadji et al., 2015). As our data indicates, in Fasa, approximately 50% of women had moderate knowledge. While in Figi, with a very high incidence of

cervical cancer, 72% of women had no knowledge about the disease (Naidu et al., 2015). In another study between Vietnamese women, 52% of participants came up with the idea that neither of cervical cancer nor breast cancer are preventive (Pham and Mcphee, 1992). A research in Jahrom, a small city with cultural, health, geographical and economical characteristics as Fasa, showed 56.5% of women had moderate knowledge (Namdar et al., 2012). Researches have shown a large population of women (68.4%) were not even familiar with cervical cancer in southern Ghana (Ebu et al., 2015). As a result, executive health programs must be considered in rural areas.

The current study indicated that 52% of women had performed Pap smear test at least once in life. This finding was consistent with the result found in Tabriz (49.4%) in 2015 (Farshbaf-Khalili et al., 2015). At the same time, in an underdeveloped country like Ghana, only 0.8% of women had performed Pap smear test up to 2013 (Ebu et al., 2015) and 14.7% in Northwest Ethiopia (Getahun et al., 2013) up to 2010. In developed countries such as United States (Sabatino et al., 2015) and Sokoto (Oche et al., 2013), the related percentage was remarkably higher (80.7%, 98.6%, respectively) among respondents. It seems that this criterion may be attributed to the level of development of the country.

The mean marital age of the participants was 21.26 and the mean age at the time of the first Pap smear was 26.89. In Fasa, there was a 5-year interval between marriage and performing Pap smear test which was similar

with the mean age of Pap smear performance in Tabriz (25.21 years) (Farshbaf-Khalili et al., 2015). Namdar's study in Jahrom (2012) revealed a long interval of 16 years between marital age and the first Pap smear age (34.91) (Namdar et al., 2012).

More than half of respondents declared that they received information from television (56%). About half of them claimed that health care workers (51%) and doctors (50%) were their sources of information and only 15% stated that they received the information from overseas satellite TV channels. In Isfahan, one of the large cities of Iran, 63% of women declared that doctors had a major role in information transfer (Tabeshian and Firozeh, 2009). Also, in West Gillan, family, friends and health workers played a significant role in the same matter (Ashtarian et al., 2017). Similarly, 55.8% of Indian women chose social media such as TV and radio for getting information (Aswathy et al., 2012s). It seems that in Fasa, the social media have a higher contribution to awareness than face to face interactions. Therefore, we should increase the involvement of health-care workers in awareness programs. Furthermore, due to the high influence of social media, broadcasting health programs through multimedia should be reinforced.

The educated participants had higher knowledge and tendency to do Pap smear in comparison with the low-educated ones. Our results were along with those of Tehran and Korea (Hadji et al., 2015; Lee et al., 2015) and in contrast with those conducted in Isfahan on female teachers (Tabeshian and Firozeh, 2009). Low income is also associated with poor behavior ($P=0.101$), which is in line with the research in Korea (Lee et al., 2015). Therefore, free screening of cervical cancer should be considered for those who cannot afford it economically.

Although this experiment revealed that a larger parity number correlated to less knowledge and poor women's behavior, the same study by Naidu and co-workers revealed a significant correlation between awareness and parity number (Naidu et al., 2015). This finding may shed some light on the lower follow-up rate before and after pregnancy among women in Fasa, so we should focus more on following the patients after delivery.

The mean value of behavior in married women is more than unmarried women. This finding was also shown by Nelson et al., (2009). Another study in Tabriz revealed no correlation between behavior and marital status (Bahmanjanbeh, 1997). Nevertheless, according to the results from Fasa, we suggest encouraging unmarried (widower, divorcee) women to perform the test.

Education level, in our study, is obviously correlated to all HBM components except perceived barriers, while the other study based on HBM in Hamadan, did not find any correlations with perceived severity (Shobeiri et al., 2016). All the components of HBM (knowledge, susceptibility, severity, benefits, barriers, and self-efficacy) except for behavior showed a positive correlation with previous history of performing Pap smear that is in accordance with a previous study in Zarandyeh (Karimy et al., 2017) and West-Gilan (Ashtarian et al., 2017). Other studies also demonstrated that the mean value of knowledge

is higher in women with previous history of Pap smear (Rezaie-Chamani et al., 2012; Ranabhat et al., 2014). Therefore, having Pap test experience increased knowledge about cervical cancer or vice versa among women. The lack of behavior in females with a positive history of Pap smear in our research, may be due to the lack of knowledge about the necessity of repeating Pap smear on specific times.

This research demonstrated that 73% of women obtained good perceived benefits and there is significant correlation between perceived benefits and behavior (according to Table 4). This may be the consequence of women's familiarity with the benefits of Pap smear and its influence on their health. Similarly, this result was confirmed by Hayden, (2009). As Shoorijeh et al., (2015) study reported, upgrading perceived benefits could make it easier to change the individual's behavior.

In current study the mean number of perceived susceptibility was 15.36 and only 35% of all the subjects had a good score. Impact of education on HBM showed that perceived sensitivity increased from 15.65 to 22.03 after education (Shoorijeh et al., 2015). As a result, health related programs should pay more attention to informing women which leads to a higher understanding of vulnerability to cervical cancer.

The data showed that 56.5% of participants had good perceived severity score which explained women's familiarity to the consequences of cervical cancer. Training has been suggested as a great factor to improve perceived severity (Tghdisi and nejadSadeghi, 2012); and therefore, can adopt preventive behavior. The lowest score was attributed to perceived barriers (51%). The higher individual's perceived barrier score has been reported to be related to the lower tendency to Pap test (Karimy et al., 2017).

The majority of respondents (61%) has shown good performance and 57% of them had good self-efficacy. Such results would hopefully increase the number of Pap smears and decrease the rate of cervical cancer in Fasa. While in a similar study in Iran, 90% of women had unfavorable behavior (Namdar et al., 2012). Behavior may be different from place to place due to a wide range of etiologies (such as education, culture, doctors, role of health centers etc.). The most predictable factors were age, income level, knowledge, perceived benefits, perceived severity and self-efficacy (Table 5). Recommended model is shown in Figure 2.

According to the previous results about the incidence of cervical cancer in Iran, this is obvious that the prevalence of this cancer is low among Iranian women. It has also been proven in a study by Khorasanizadeh et al., (2013) that Iran has a low incidence rate in cervical cancer with differences in ASR ratio from one place to another one.

The ASR reported for cervical cancer was 0.4 in Ardabil, Iran from 1996 to 1999 (Sadjadi et al., 2003) and it was 4.8 in Tehran, Iran during 1998-2001 (Mohagheghi et al., 2009). This amount estimated 2.8 among Iranian women in 2012 (Mohebbi et al., 2018). We can get this point that in smaller cities such as Ardabil in comparison to larger cities like Tehran, the women has lower tendency

and knowledge for doing screening test; therefore, the ASR for cervical cancer would be lower. The incidence of cervical cancer can be almost tripled according to estimated five-year prevalence in Iran (ASR: 9.1) (Mohebbi et al., 2018). Another study in southern Iran confirmed an increase in cervical cancer rate in 2007-2010 as compared to 1998-2002. This increase might be due to raising awareness and participation in cervical cancer screening among women in future years (Masoompour et al., 2016). As a matter of fact, the low ASR ratio in cervical cancer doesn't mean that certainly the prevalence of this cancer is not high in Iran, it might be due to lower screening tendency and knowledge of Pap smear test among Iranian women. Another study concluded that it is essential for every women in Iran, even if it is considered as low incidence rate country, to take part in cervical cancer screening test (Majidi et al., 2015). In fact cervical cancer is going to be much more prevalent in Iran in following years so it can be wise that every woman should do Pap smear screening test in order to prevent cervical cancer and decrease the related ASR in future studies. Also screening test must be considered as one of the essential health policies in Iranian health system which requires close supervision in every region. This goal is basically in accordance with conclusion in Khodakarami et al., (2016) research.

Regarding to the study which is performed in Kermanshah, Iran to assess cost-effectiveness of cervical cancer screening during 2004-2007, there was not reported any carcinoma or HSIL in patients younger than 35 years old and the average time for developing LSIL and HSIL (High-grade squamous intraepithelial lesion) to cancerous lesions is about 5 years. AS a result, it would be more cost-benefit to do Pap smear test after the age 30 (Nokiani et al., 2008). According to the research in Cantabria on Spain's north coast, performing cervical cancer screening in period of 5 years can be more cost-effective than doing every 3 years (Ramos-Barron et al., 2014). Another research study in Iran evaluated cost-effectiveness of Cervical cancer screening, the result suggested that it is better to perform screening by HPV DNA testing from age 35 with interval 5 to 10 years because the incidence rate of cervical cancer is low in Iran (Nahvijou et al., 2016). A systematic review study in Iran confirmed that using HPV DNA testing for screening can have more cost-benefit than Pap smear (Nahvijou et al., 2014). The research in Taiwan concluded that performing Pap smear test is still the most cost-effective method for cancer prevention (Chen et al., 2011). Due to previous studies, Iran considered as a country with low incidence rate of cervical cancer; therefore, we can recommend women to perform screening test from the age 30-35 with interval 5 years but more studies need to be done to find the most cost-effective strategy for cervical cancer screening.

In conclusion, by planning careful preventive programs based on predictable factors, we can increase the number of women who have a proclivity to do Pap smear test regularly and consequently decrease cervical cancer rate in following years. Future studies may also examine adolescent females to menopausal ones. It would

also be more efficient to set up some clinics which offer free diagnostic services and screening tests for those who cannot afford them. Besides, it can be suggested that social media broadcast more programs related to cancer preventive behaviors and health care workers must train women more than before.

This study had some restrictions. Only evaluating women who visited the health centers is the major imitation as it could have raised their knowledge of cervical cancer and Pap smear. Therefore, further studies, evaluating all women in the society whether they are visiting a health care center or not, are required to fully assess their knowledge and HBM components.

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