

ORIGINAL ARTICLE

The Relationship between Health Locus of Control and Iranian Women's Beliefs toward Pap Smear Screening

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Received: 30 July 2018 **Revised:** 29 September 2018 **Accepted:** 8 October 2018

ABSTRACT

Background: Cervical cancer has a high prevalence and mortality, while early diagnosis greatly reduces its complications. Therefore, it is important to identify the factors affecting the screening of cervical cancer. Studies have shown that health locus of control plays an important role in beliefs about screening. This study aimed to identify the correlation between health locus of control and beliefs about Pap smear among women.

Methods: This was a descriptive study which was conducted cross-sectionally. It was conducted on 250 married women who had the inclusion criteria and attended health centers selected by Shahid Beheshti University of Medical Sciences in Oct. 2017 to February 2018 (a period of 5 months). Data collection tools included a demographic information questionnaire, multidimensional health locus of control scale, and the Pap Smear Belief Questionnaire (PSBQ). Data analysis was carried out through SPSS (v.17) using statistical tests including correlation and regression. The significance level was considered 0.05.

Results: Among the participants, 50.8% never had a history of undergoing a Pap smear test. The mean scores for the internal health locus of control (IHLC), chance health locus of control (CHLC), and powerful others health locus of control (PHLC) were 22.59 ± 5.32 , 22.84 ± 4.65 , and 24.54 ± 4.28 , respectively. The total score for the Pap smear belief had a significant positive correlation with two dimensions: IHLC ($r=0.209$, $P=0.001$) and PHLC ($r=0.216$, $P=0.001$). In addition, based on the results of the linear regression analysis, the scores of IHLC ($R^2=0.03$, $P=0.004$), PHLC ($R^2=0.036$, $P=0.003$), and CHLC ($R^2=0.16$, $P=0.04$) were the predictors of the total score for the Pap smear belief.

Conclusion: Our results showed that all dimensions of the health locus of control were the predictors of belief in women's Pap smear screening. It is necessary that health care providers hold programs for health locus control of cervix cancer prevention in Iranian women.

KEYWORDS: Health locus of control, Cancer screening, Cervical cancer, Pap smear, Health belief

Please cite this article as: Saei Ghare Naz M, Darooneh T, Rashidi Fakari F, Kholosi Badr F, Hajizadeh F, Ozgoli G. The Relationship between Health Locus of Control and Iranian Women's Beliefs toward Pap Smear Screening. *IJCBNM*. 2019;7(1):43-51. doi: 10.30476/IJCBNM.2019.40845.

INTRODUCTION

The female reproductive system cancers are the third most prevalent cancers in women.¹ A total of 527,600 new cases of cervical cancer were identified in 2012, out of which 265,700 cases resulted in death. This cancer is the most common female genital tract malignancy,² the third most common cancer among women,³ the second most commonly diagnosed cancer and the third cause of death among women in less developed countries.⁴ The age-standardized incidence rate for cervical cancer is 2.5 per 100,000 people in Iran, and its incidence rate increases after the age of 30.⁵ The International Agency for Research on Cancer (IARC) estimates that the incidence of cervical cancer will increase by 75% worldwide by 2030.⁶

Since the introduction of the Pap smear in 1941, cervical cancer has become preventable.⁷ A Pap smear test is a non-invasive simple method to detect precancerous and cancerous changes. This method is being used all over the world.⁸ Early detection of this cancer by screening improves the treatment outcome and survival chance.⁶ Based on the national program, Pap smear is offered to all women after marriage in health care centers free of charge. This was done for 3 consecutive years, and if three normal Pap smear samples were obtained, after that this test should be repeated every 3 years.⁹ In Western countries, where screening programs are carried out, the incidence of cervical cancer has declined by more than 65%.⁴ Unfortunately, test uptake was not favorable in Iran and based on previous reports, just 49.4% of Iranian women had done the test once in their lives, while this rate is 85%–93% in other countries.⁹ A study conducted in Iran in 2016 showed that cervical cancer screening programs along with HPV, DNA testing on Iranian women from the age of 35 and repeating them every 5 to 10 years could greatly reduce the mortality of this cancer.¹⁰

Various factors play roles in failure to perform Pap smear tests; they include lack of knowledge, beliefs in the incurable of

cancer, and religious beliefs,¹¹ fear of pain, lack of attention to health needs,¹² poor communication with healthcare providers,¹³ psychological reasons, time and cost constraints, inadequate education in this regard,¹⁴ misconceptions about cervical cancer screening, lack of support from their spouses for screening, cultural taboos regarding the gender of health care providers, and the stigma of women with cervical cancer.¹⁵ Evidence reported that women in Eastern China had a low level of knowledge about cervical cancer, and despite the existence of screening programs, the screening rate was not high among them.¹⁶ Evidence suggests that the amount of knowledge about Pap smear tests in Iran is similar to that in other developing countries.⁷ Also, it should be mentioned that the Pap Smear Belief Questionnaire (PSBQ), which was used in this study, evaluates women's belief toward cervical cancer screening. It contains 28 questions in four main components, including the factors related to performing Pap smears (Exam-related factors); benefits; vulnerabilities; and risks, barriers and benefits.¹⁷

The health locus of control, in fact, acts as a mediator between the individual, social, and health status.¹⁸ The health measures of the health locus of control are one of the components of belief in the multidimensional health locus of control; that is, the belief that a disease is controllable and preventable creates a positive attitude towards adopting preventive behavior by individuals. And if an individual believes in the external locus of control, then he/she will consider chance, fate, etc. as the factors affecting the disease, and consequently, his/her negative attitude towards the controllability of the disease can result in failure to adopt disease preventive behaviors.¹⁹

There is a link between the health locus of control and prevention behavior of women.²⁰ The concept of the health locus of control is an important factor in individuals' perception about their control over health behaviors.²¹ Health control beliefs have an important effect

on the adoption of healthy and unhealthy behaviors.²² Since health beliefs are among the psychological barriers which play important roles in individuals' participation in screening,²³ and given the absence of a study in this regard in Iran, this study was conducted with the aim of determining the relationship between the health locus of control and the Pap smear belief.

MATERIALS AND METHODS

The present study was a descriptive cross-sectional study conducted in October 2017 to February 2018 (a period of 5 months); the study population consisted of women attending healthcare centers affiliated to Shahid Beheshti University of Medical Sciences in Tehran. The sample size for this study was calculated 250 ($\alpha=0.05$).

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{\beta} \right)^2 p(1-p)}{d^2}$$

The inclusion criteria for the study were being Iranian, over 20 years of age, married, and able to read and write. The exclusion criterion were the patient's lack of willingness to continue cooperation in the study. In this study, sampling was carried out at healthcare centers in northern and eastern parts of Tehran, which were affiliated to Shahid Beheshti University of Medical Sciences. Three researchers collected the data of study. The ethics committee of Shahid Beheshti University of Medical Sciences approved the study with the code number of 1396/50149. Informed written consent was obtained from all the subjects. Simple sampling was carried out on patients inside the centers.

A questionnaire containing demographic information (age, age of marriage, level of education, income, and job); the Pap Smear Belief Questionnaire (PSBQ); and the multidimensional health locus of control scale were used to collect the data.

The Pap Smear Belief Questionnaire (PSBQ) contains 28 questions. It was first designed by Ackerson et al. in English in 2017. This instrument consists of four main components: factors related to performing Pap

smears (13 items, scores 13-65); benefits (4 items, scores 4-20); vulnerabilities (3 items, scores 3-15); and risks, barriers and benefits (4 items, scores 4-20).¹⁷ After obtaining permission from its designer, the scale was translated by two specialists (forward-backward translation according to World Health Organization standard). Eventually, the translated tool was confirmed by the designer. In this study, the validity of this questionnaire was determined through qualitative content and face validity assessment, so that after being corrected and approved by members of the research team, this form was put at the disposal of ten specialist faculty members for review. The content validity index of the items was more than 0.79, and the content validity ratio was more than 0.62, which was at an acceptable level. The final instrument was used after considering the recommendations and necessary corrections. To determine the reliability of the PSBQ questionnaire, first Cronbach's alpha coefficient for the instrument was calculated. The whole instrument had an appropriate Cronbach alpha equal to 0.93. Its intraclass correlation coefficient was 0.98, which was at an acceptable level. To assess the reliability, the Persian version of the questionnaire was administered twice among a sample of 35 subjects at an interval of two weeks. Through psychometric tests carried out in this study, four questions (14, 19, 20, and 21) were omitted, and the 24-item questionnaire based on a Likert scale from "completely disagree" to "completely agree" (score:1-5) was used. The total score was from 24 to 120. Based on exploratory factor analysis in 318 married women, the KMO test was 0.87 for the adequacy of the sample size. According to the exploratory factor analysis, the four dimensions of the tool had a variance of 58.46%. Then, the confirmatory factor analysis was performed, which in the first round of the four items (14-19-20-21) did not have a good factor, and the indexes of the model had poor fit; then, in the second half of the factor analysis, with the removal of four items, the Goodness-of-fit indices

for this scale are: Root Mean Square Error of Approximation=0.08, Comparative Fit Index=0.93, Incremental Fit Index=0.9, and Chi-square=866.48.²⁴

The multidimensional health locus of control scale: The multidimensional health locus of control scale was developed by Wallston et al. in order to determine the individuals' health locus of control. This scale consists of 18 items. This scale evaluates beliefs related to the individuals' health. Six questions are about internal health locus of control (IHLC: 6 items, scores 6-36) (the belief that one's health depends on his or her own actions and behavior); six questions about powerful others' health locus of control (PHLC: 6 items, scores 6-36) (the belief that one's health deliberately depends on the behaviors of powerful others; and six questions about the chance health locus of control (CHLC: 6 items, scores 6-36) (the belief that one's health is a matter of chance). Each subset has choices based on a 6-point Likert scale. The total score is from 18 to 108. In this scale, high scores show the high

importance of health control. The Persian version of this instrument is reliable and valid in Iran. Cronbach's alpha coefficients were obtained to be 0.70, 0.69, and 0.75 for the following components: IHLC, CHLC, and PHLC, respectively.²⁵

Data analysis was carried out using the SPSS, version 17. The statistical tests: correlation and linear regression, were used in the data analysis. Pearson correlation analysis was used to determine the correlation of health locus of control with Iranian women's beliefs toward Pap Smear screening; then, for determining the predictors of pap smear belief the linear regression was used (by controlling confounding factors). In the regression model, the total score of PSBQ is the dependent variable and other factors were considered as independent variables. The significance level was considered to be 0.05.

RESULTS

Two hundred fifty married women, ranging in age from 21 to 75 years, participated in this

Table 1: Demographic characteristics of the women who participated in this study

Variable	Mean±SD
Age (yr.)	36.63±11.37
Number of children	2.23±1.42
Marriage duration (yr.)	14.71±12.38
Marriage age (yr.)	21.02±4.77
Education level	N (%)
Illiterate	21 (8.4%)
Under diploma	58 (23.2%)
Diploma	76 (30.4%)
Academic	89 (35.6%)
Missing data	6 (2.4%)
Employment status	
Housewife	188 (75.2%)
Employed	56 (22.4%)
Missing data	6 (2.4%)
Economic status	
Good	18 (7.2%)
Intermediate	187 (74.8%)
Poor	40 (16%)
Missing data	5 (2%)
Smoking	
Yes	13 (5.2%)
No	225 (90%)
Missing data	12 (4.8%)

study. Among the participants, 75.2% were housewives, 35.6% had academic education, and 74.8% had enough income to live on. Table 1 shows the demographic characteristics of women who participated in the study. From among the participants, 50.8% never had a history of undergoing a Pap smear test. The overall mean score for the Pap smear (cervical cancer screening) beliefs was 75.94±12.86 at a minimum of 24 and a maximum of 120. The mean scores for IHLC, CHLC and PHLC were 22.59±5.32, 22.84±4.65, and 24.54±4.28 respectively. Overall, the PHLC dimension had the highest mean score, and the other two dimensions had similar mean scores.

Based on the results of the correlation analysis, the Exam-related factors and the Benefits Factor had a significant positive correlation with all dimensions of the health locus of control. The risks and barriers factor (r=-0.174, P=0.006) had a significant reverse correlation with the CHLC dimension. The vulnerability factor had a significant reverse correlation with the IHLC (r=-0.24, P=0.001) and CHLC (r=-0.177, P=0.005) dimensions. Also, the total score for the Pap smear belief had a significant positive correlation with IHLC (r=0.209, P=0.001) and PHLC (r=0.216, P=0.001) (Table 2). Based on the results of the linear regression analysis, the scores of

Table 2: The correlation between the Pap Smear Belief Questionnaire subscales and Multidimensional Health Locus of Control scales

Variable	Internal Health locus of control		Powerful others Health locus of control		Chance Health locus of control	
	r	P value*	r	P value*	r	P value*
Exam-related factors	0.33	0.001	0.21	0.001	0.13	0.04
Benefits	0.291	0.001	0.91	0.001	0.426	0.001
Risks and barriers	0.06	0.31	0.06	0.34	-0.174	0.006
Vulnerability	-0.24	0.001	-0.03	0.607	-0.177	0.005
Total PSBQ ^a	0.209	0.001	0.216	0.001	0.32	0.06

^aThe Pap Smear Belief Questionnaire; *Pearson correlation test

Table 3: Regression model for predictor variable of the Pap Smear Belief Questionnaire score and its subgroup items

Dependent variable	Model	R ²	B	Std. Error	Beta	t	P value*
Total PSBQ ^a	IHLC ^b	0.081	0.49	0.173	0.206	2.87	0.004
	PHLC ^c		0.66	0.21	0.22	3.03	0.003
	CHLC ^d		-0.43	0.217	-0.157	-2.006	0.04
	Age(year)		0.02	0.07	0.024	0.381	0.7
Exam-related factors	IHLC ^b	0.133	0.67	0.14	0.33	4.84	0.001
	PHLC ^c		0.38	0.17	0.15	2.16	0.03
	CHLC ^d		-0.28	0.17	-0.12	-1.61	0.1
	Age(year)		0.06	0.05	0.06	1.07	0.284
Benefits	IHLC ^b	0.835	-0.01	0.018	-0.03	-1.02	0.3
	PHLC ^c		0.7	0.02	0.95	30.8	0.001
	CHLC ^d		-0.04	0.02	-0.06	-1.85	0.06
	Age(year)		0.008	0.007	0.03	1.14	0.255
Risks and barriers	IHLC ^b	0.09	0.13	0.05	0.163	2.29	0.023
	PHLC ^c		0.18	0.07	0.18	2.53	0.012
	CHLC ^d		-0.03	0.07	-0.33	-4.32	0.001
	Age(year)		-0.03	0.023	-0.093	-1.502	0.134
Vulnerability	IHLC ^b	0.072	-0.107	0.03	-0.22	-3.08	0.002
	PHLC ^c		0.07	0.044	-0.126	-1.59	0.112
	CHLC ^d		-0.07	0.04	-0.12	-1.59	0.112
	Age(year)		-0.005	0.01	-0.02	-0.34	0.72

^aThe Pap Smear Belief Questionnaire; ^bInternal Health locus of control; ^cPowerful others Health locus of control; ^dChance Health locus of control; *Linear Regression

IHLC ($R^2=0.03$, $P=0.004$), PHLC ($R^2=0.036$, $P=0.003$), and CHLC ($R^2=0.16$, $P=0.04$) were the predictors of the total score for the Pap smear belief. Age had no significant relationships with any of the factors related to the Pap smear beliefs. Table 3 shows the results of the linear regression for the Pap smear beliefs subunit.

DISCUSSION

The results of this study, which were conducted on 250 married women who complied with the inclusion criteria for the study, showed that the total score for the Pap smear belief (women's attitude towards and knowledge about cervical cancer screening) had a significant positive correlation with the two dimensions of IHLC and PHLC. In addition, in this study, all three dimensions of health locus of control were predictors of the Pap smear belief.

Among several factors which can affect the preventive behavior of women, researchers have emphasized the importance of individual responsibility regarding cancer screening behaviors. Therefore, women's beliefs about "to what extent they are involved in the control of their health?", can serve as an internal motive for good health behavior.²⁶ In one study on Iranian population, the most important factors predicting the women's cancer screening behavior were their beliefs, self-efficacy, and barriers.⁹ However, in another study in 2015, belief in chance and belief in others had no significant relationships with women's attitudes toward breast cancer.²⁶ According to the source of health control theory, those who believe in the internal source of health control believe that their health is directly due to their behavior and performance, while people who believe in the external health control source consider such factors as physicians, luck, and fate to be responsible for their health.²⁶

The findings of our study also showed that internal, powerful others and chance health locus of control could predict the Pap smear belief of women. Along with this,

evidence suggests that health control beliefs are related to preventive behavior, and beliefs play an important role in health screenings.²⁷ Consistent with our results, in another study health beliefs along with IHLC were the predictors of behavior in breast cancer screening.²⁸ It seems that several components of pap smear belief including exam-related factors, benefits, risks and barriers and Vulnerability are affected by multidimensional health locus of control. It is very important that health care providers understand the pap smear belief of women, the factors affecting this belief, and screening measures. On the other hand, the belief of women and health locus of control belief together shape the cancer screening behavior and practice. In Iranian culture, embarrassment and fear about pap test related examination and specially regarding the importance of privacy can contribute to negative beliefs regarding Pap test, and cause women's low participation in cervical cancer screening.

However, contrary to our findings in a study in 2015, belief in chance and belief in others had no significant relationships with Iranian women's attitudes toward breast cancer.²⁶ However, it should be noted that the serious difference between this study and ours was that we measured the screening belief, but they measured the attitude of women.

Behavior control is related to the factors effective in facilitating or inhibiting the behavior performance. Such factors are considered as "control beliefs" and include personal beliefs about both internal issues (information, skills, and emotions) and external issues (opportunities, dependence on others, and structural barriers).²⁹ One study showed that students who underwent more Pap smears were more aware of their benefits, and had fewer barriers to screening. In addition, those who had begun sexual intercourse at an early age and were non-smokers were more likely to do Pap smears.³⁰

In the present study, the age of women who participated in the study was not a predictor of the Pap smear belief and its

different dimensions. Also, almost half of the participants did not have a history of undergoing a Pap smear, while the majority of the participants were in an average economic status, and the majority of them had high school diplomas or higher. A study in Iran has shown that women with a higher socioeconomic status, higher level of education, and higher amount of knowledge had more appropriate behavior in terms of cervical cancer screening.³¹ In a descriptive study with the aim of evaluating the frequency of undergoing Pap smear tests, the results showed that the age of marriage, number of pregnancies, occupation, level of education, place of residence, and insurance had a statistically significant relationship with attitude.³² In another study, it was reported that the level of education, and women's age were among the factors related to knowledge about Pap smear tests.³³ Overall, given that the mean score for PHLC belief was the greatest among those participating in this study, and IHLC belief and CHLC belief had mean scores close together, it seems that in the studied population, reinforced IHLC belief as well as the enhanced education of powerful others, such as health care workers, can greatly contribute to the adoption of health behaviors. Because the stronger the IHLC is, the more it will create health promotion and disease prevention behaviors.³⁴ The results of Hashemian et al. (2013) was different; in their study, the mean scores related to IHLC and PHLC were almost equal and the lowest score was the sub-scales of CHLC.²⁶ It seems that increased attention to the screening and identification of challenges and offering strategies based on these challenges will help to achieve a successful screening program.³⁵

This study has some strengths and limitations; the strength of this study was that the result of this study can be used in the health system for improving the efficacy of pap smear programs. Another strength of study was its focus in the link between the health locus of control and pap smear belief. One of the limitations of this study was that

the data were gathered among the women who attended healthcare centers in order to receive services, so the results are not generalizable to the whole society. Therefore, it is suggested that, in future studies, data should be gathered from other sectors of the society. In addition, given that according to the results of this study, health control beliefs were predictors of Pap smear beliefs, it is suggested that educational consultations and interventions should more radically focus on the reinforcement of disease control beliefs and correction of beliefs.

CONCLUSION

The results of this study showed that all dimensions of the health locus of control were the predictors of belief in women's Pap smear screening. Hence, our suggestion is that attention should be paid to this important fact in educational intervention programs to increase the women's adherence to Pap Smear screening.

ACKNOWLEDGEMENT

This study is related to the project NO:1396/50149 From Student Research Committee, Shahid Beheshti University of Medical Sciences, Tehran, Iran. We also appreciate the "Student Research Committee" and "Research & Technology Chancellor" in Shahid Beheshti University of Medical Sciences for their financial support of this study.

Conflict of Interest: None declared.

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