

# The Effect of Health Belief Model-Based Training on Cervical Cancer Screening Behaviors

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## ABSTRACT

**Objective:** Cervical cancer remain a major public health problem, ranking as the fourth most common cause of cancer incidence and mortality in women worldwide in 2019. Prevention and early detection of cancer are considered as critical factors in controlling the disease and increasing the survival of patients. Therefore, we aimed to investigate the effect of Health Belief Model (HBM)-based education on cervical cancer screening behaviors.

**Methods:** This is a descriptive type of study. The participants attended training workshops based on HBM. Data were collected by the questionnaire developed by the researchers and the Health Belief Model Scale Turkish version.

**Results:** Twelve women (13%) from the participants had already taken the test before training. After training, the majority (n=56) of women had the Pap smear test (70%). Reasons for not getting a Pap-Smear Test (n=24) were determined as no need / no risk (n=13), no opportunity (n=7) and shyness (n=4) respectively.

**Conclusion:** Our findings showed that the health education programs designed based on HBM could positively affect cervical cancer preventive behaviors.

**Keywords:** Health Belief Model, Pap smear, training program, cervical cancer

## 1. INTRODUCTION

Cervical cancer is the fourth most common cancer in women, with over 570,000 new cases diagnosed worldwide in 2019. The annual number of deaths due to cervical cancer is around 312,000 (1). According to 2018 data, the incidence of cervical cancer in Turkey has been determined as 4.5 in 100 thousand (2). In Turkey, 1005 new cases of cervical cancer were diagnosed and the total number is 4238. Cervical cancer is one of the nine cancers with the highest mortality rate. However, only 20% of women had Pap smear tests performed in 5 years (3).

World Health Organization (WHO) states that cervical cancer-related mortality has been increasing in developing countries (4). Risk factors such as increased rates of smoking in women, polygamy, decreased coitus age due to early marriage, multiparity, and low education/socio-economic levels are common in women in Turkey.

WHO reports cervical cancer as preventable cancer. Despite all risk factors, mortality and incidence of cervical cancer can be reduced by screening (5). The effectiveness of treatment is low since the symptoms of cervical cancer are absent until cancer progresses. An analysis by WHO stated that even

by a Pap smear scan at 10-year intervals, the incidence of cervical cancer can be reduced by 64% (4). Pap smear and HPV tests have been initiated since 2014 within the scope of the National Cancer Screening Program in Turkey (2,3). However, many factors affect women's having Pap smear tests. These factors include sociocultural factors, cancer awareness, lack of courage, and attitudes and advice from healthcare providers (6).

WHO defines "health education" as information sharing on the benefits of available resources and access to services and how to prevent diseases. This information sharing is frequently used by healthcare providers to change behavior-based Health Belief Model (HBM), Transtheoretical Model, Social Cognitive Theory, Precede-Proceed Model, Protection Motivation Theory (PMT), combined model and health education models (4-6).

HBM has been widely used to measure the health beliefs and behaviors about cancer screening (6-11). HBM is a cognitive model that tries to identify patterns of health behavior. The perceived susceptibility, perceived seriousness, perceived

benefits, perceived barriers, and perceived motivation are five main components of the HBM.

Perceived susceptibility refers to beliefs about the probability of obtaining a disease or condition. Perceived seriousness is about feelings concerning the seriousness of acquiring a sickness or of leaving it untreated. Perceived benefits focus on the effectiveness of healthy behavior in reducing the threat of the condition. Perceived barriers are the potential negative aspects of a particular health behavior, a kind of unconscious, cost-benefit analysis occurring when the individuals know the perceived barriers are more costly than the perceived benefits. Health motivation refers to a generalized state of intent that results in behaviors to maintain or improve health. The concept of health motivation used in combination with the original five HBM concepts has evidence of significant predictive ability (7-8). Therefore, in this study we used HBM focusing on prevention as a reference framework. We aimed to investigate the effect of HBM-based education within the context of cervical cancer screening behaviors.

## 2. METHODS

### 2.1. Objective

The aim of this study was to investigate the effect of HBM-based education on cervical cancer screening behaviors.

### 2.2. Study Design

This is a quasi-experimental study.

### 2.3. Setting and Participants

The inclusion criteria were as follows: sexual active women, able to read and speak Turkish who accepted to be included in the study. Women with a history of cancer or mental illness were excluded from the study. The study was carried out at the public education center.

### 2.4. Data Collection

The data were collected by the probable sampling method. Information Form and Health Belief Model Scale were used as data collection tools. At the first stage, all women who volunteered to participate in the study were trained about Pap smear test/cervical cancer for approximately 30 minutes. Theory-based educational interventions (Health Belief Model) were considered. These educational interventions included videos and power point presentations. After three weeks, the training was repeated by the same educator and the presentation was completed with an emphasis on the question-answer method. After three weeks, the research was completed by the same educator by filling in the Pap smear test uptake status and Health Belief Model Scale (9) and information form (Fig 1).

### 2.5. Ethical Consideration

Ethics approval with 01-2018/03 number was obtained from Karamanoglu Mehmetbey University on 31.01.2018.

### 2.6. Statistical Analysis

Data analysis was conducted using SPSS trial version 24.0. The mean and percentage values were calculated, and the Student's t test was used.

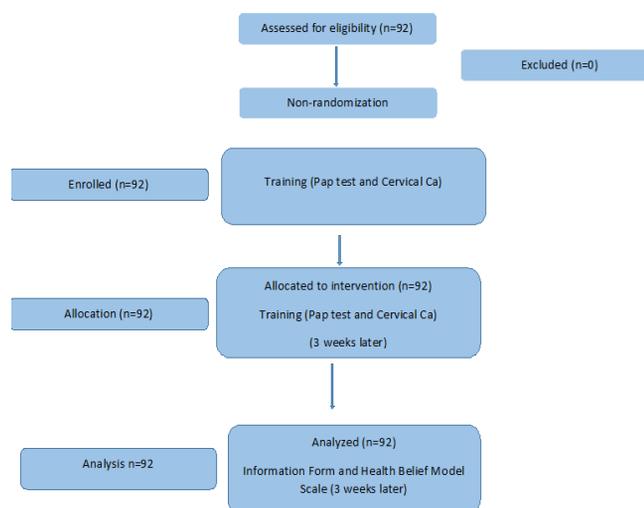


Figure 1. Research Flow TREND Diagram

## 3. RESULTS

The participants' characteristics are given in Table 1. A family history of gynecologic cancer was reported by 9.8% of the women while 94.2% did not smoke and 79.8% did not perform exercise. Parity-related features were as follows:  $3.18 \pm 1.84$  pregnancy,  $2.48 \pm 1.15$  labor,  $1.29 \pm 0.6$  curettage, and 22.8% reported to be menopausal. Almost half of the women (43.5%) had never heard of the Pap smear test. Twelve women (13%) had already taken the test before training.

Table 1. Participants Characteristics (n=92)

		n	%
Year	20-38 years	30	32.6
	39-57 years	62	67.4
Marital Duration	1-5 years	8	8.7
	6-10 years	10	10.9
	≥11 years	74	80.4
Marital Status	Married	86	93.5
	Unmarried	6	6.5
Educational Level	≤ 8 years	45	48.9
	≥9 years	47	51.1
Working Status	Yes	14	15.2
	No	78	84.8
Family Type	Nuclear	84	91.3
	Joint	8	8.7

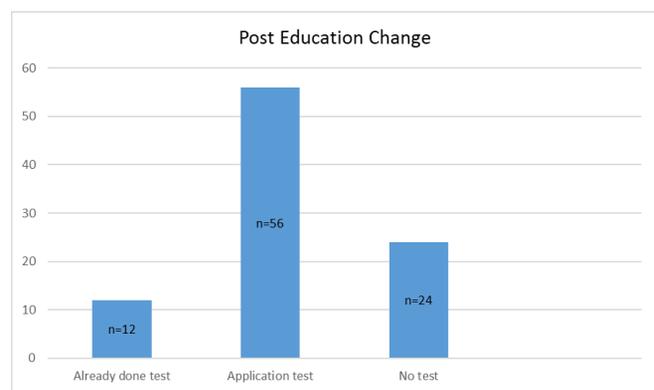
A relationship was found between the perceived seriousness of the scale and the family type (nuclear family) (Table 2) ( $p < 0.05$ ).

**Table 2.** Participants' Characteristics and Comparison of the Health Belief Model Scale (n=92)

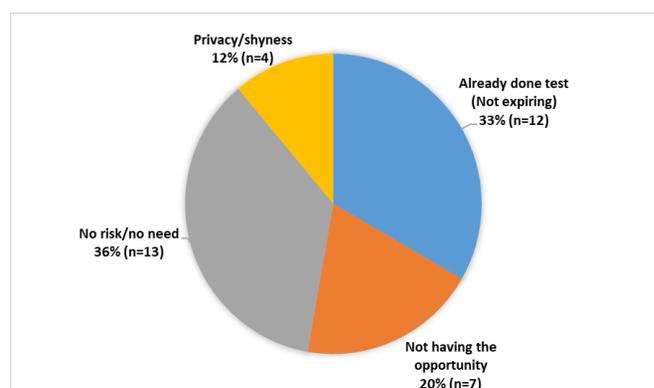
Characteristics		Perceived Susceptibility	Perceived Seriousness	Perceived Benefits	Perceived Motivation	Perceived Barriers
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Marital Status	Married	7.63 ±2.18	24.51±0.72	30.25±1.76	8.83±1.18	37.01±1.16
	Unmarried	8.16 ±1.72	24.33±1.18	26.16±1.68	9.16±1.28	35.83±1.19
	p	0.116	0.21	0.19	0.55	0.61
Family Type	Nuclear	7.77±2.28	24.67±1.26	30.27±1.48	9.01±1.77	36.79±2.05
	Joint	6.62 ±1.96	21.87±2.08	27.00±1.98	7.25±2.07	38.37±2.72
	p*	0.41	<b>0.034</b>	0.15	0.82	0.58
Education Level	≤8 years	7.85 ±2.58	25.00±1.17	27.42±0.78	6.87±2.22	43.57±3.18
	≥9 years	8.33±1.96	25.33±2.18	30.16±1.16	8.50±1.96	63.50±2.96
	p*	0.22	0.43	0.16	0.49	0.98
Menopause	Yes	7.95±1.78	24.52±1.76	29.42±1.18	8.42±0.78	39.23±1.58
	No	7.59±2.17	24.40±2.58	30.15±1.26	8.98±0.96	36.25±2.04
	p*	0.62	0.32	0.09	0.08	0.45
Pap Smear Test Application After Education	Yes	7.66±3.01	24.62±2.28	30.39±1.78	8.92±2.36	36.76±2.18
	No	7.69±2.96	24.13±2.36	29.36±1.45	8.75±1.98	37.19±2.77
	p*	0.94	0.63	0.40	0.74	0.79

SD: Standard Deviation; \*Student's t-test

After training, very few women (n=24; 26%) had no Pap smear test. Among the women who did not have the test, 12 women had a test in the past year (Fig 2). Reasons for not having Pap smear test are given in Fig 3.



**Figure 2.** Post Education Pap Smear Test Application



**Figure 3.** Reasons for Not Having a Pap Smear Test

#### 4. DISCUSSION

The majority (87%) of the respondents reported not having gone through previous Pap smear testing; only 13% reported a regular Pap smear test. In the study of Temel conducted on 625 women aged 35 and over living in Sivas, women had Pap smear tests done at least once in a lifetime (12.3%), at least once in the last three years (10.5%) and at least once in the last five years (11%) (10). In a cross-sectional study on the protection of breast and cervical cancer on 1007 women aged 15–65 in Diyarbakır, it was reported that 10% of women had a Pap smear test in the past year (11). The regular use of the Pap test was also low in other developing countries (12,13). For example, only 7% of the nursing staff in a tertiary-level teaching institution in rural India had been screened by the Pap test (13). In a population-based study covering 57 countries, the country has estimated at least one Pap smear test rate of 40% for all countries, with an approach that takes into account the population. In that research it reports that the rate of having a Pap smear test at least once in the past three years was above 80% in Austria and Luxembourg, and below 1% in Bengalia, Ethiopia and Myanmar (14). In a study conducted among South Asian women living in New York, it was reported that 67% of women had a Pap smear test and 13% had this test in the last year (15). In this study, it is seen how important the health system of the country where women live more than their ethnic characteristics. In developed countries, where there is proper access to effective cervical cancer screening, the regular use of the Pap test is higher than in developing countries (16,17), resulting in a lower rate of death from cervical cancer in these countries (18).

In Turkey, cervical cancer screening is free of charge and are widely available in the public health sector. An understanding

of factors that predict cervical cancer screening behavior may contribute to the development of more effective screening. The present study used the Health Belief Model (HBM) theoretical frameworks for understanding the predictors of the behavior of Turkish women with regard to cervical cancer screening. According to our results, a relationship was found between the perceived seriousness of the scale and the family type (joint family). The perception of seriousness is a very important factor as it enables to act. People living in a large family may be affected by the emotions, thoughts and experiences of previous generations. Therefore, it is necessary to be aware that these women are risk groups (18).

It is underlined that the necessity of model-based education in an existing meta-analyses in undeveloped and developing countries like our country. Because it is claimed that education given without knowing the personal features and obstacles will only increase the knowledge of cervical cancer (19). In this study, training was provided using HBM. It was determined that only 30% of the women did not have Pap smear test after education. Considering that a single negative Pap smear test reduces the risk of developing cervical cancer by 45% and 9 smear tests are taken throughout life, it reduces cervical cancer risk by 99%; the importance of gaining regular screening habits in preventing cervical cancer is undeniable (20).

This study focused on possible reasons for not having Pap smear tests. In this research 12% of the women reported that they did not test because they could not overcome their sense of embarrassment. In a similar study conducted in our country, the rate of embarrassment was found to be 8% (21). Olaza-Maguiña determined the feeling of embarrassment as an obstacle in the 4-6 year follow-up study (22). In a similar study conducted in Thailand, it was determined that the most important obstacle in the Pap smear test was the sense of shame of women. They proposed using the Kato technique to overcome the embarrassment barrier in this study. In this technique, the woman can take the smear preparation on her own using the Kato device (21). In a study with medical school students in Malaysia, embarrassment has been identified as an important barrier. In this study, one out of every two women stated that she did not have a smear test due to embarrassment. In a similar studies the feeling of shame is underlined (23-24). In Liebermann's Latin America and the Caribbean region shame has been identified as an important barrier (25). The embarrassment barrier is universal, but it is relatively heavier in Muslim countries. Alternative ways to overcome this barrier, such as psychological support or using a Kato instrument, can be produced.

Many women think that there is no risk of cervical cancer in their lives and therefore no need for testing. This reason was underlined by several studies (26-30). In a similar study conducted in Sri Lanka, 47% of women reported that the test was unnecessary for them (31). In the studies of Guo et al. (32), no positive relationship was found between ob / gyn counseling and having a Pap smear. Similarly, in this study, some women answered "no need / no risk" (36%) even after

training. Therefore, it may be effective, persuasive and cost-effective for healthcare professionals to use mass media as well as educate individual or local groups.

In this study, it was determined that 20% of women did not have Pap smear tests on the grounds of not having an opportunity. This allegation can be dealt more easily than "shyness" and "no risk" reasons. As a matter of fact, although women know that they should get it done, they are not able to get the Pap test due to the problem of time management. Perhaps, if women were followed in the following months, they might have been found to have Pap tests.

There are many studies evaluating the effectiveness of training aimed at promoting the Pap smear test. Often these studies evaluated the impact of attempts such as reminder calls and messages, invitation letters, reminder letters and appointment requests over the phone. All training programs have performed the function of increasing the Pap smear test. In a recent meta-analysis, it was found that the training programs increased the test rate by 2.5 times (19). In our this study, 60% of women had a test after training.

As a result, HBM-based training significantly increases smear rate. After training, very few women had no Pap smear test. When using the model in future studies, it may be more effective to include solution suggestions for privacy, /no need risk, and lack of opportunity. Our findings showed that the health education programs designed based on HBM could positively affect cervical cancer preventive behaviors.

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