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## Evaluation of Predictive Factors and Barriers to Cervical Cancer Screening in Women Referring to Comprehensive Health Centers in Khorramabad, Lorestan Province, Iran during 2020

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## Abstract

**Background:** Cervical cancer is among the most common malignancies in women, especially in developing countries. Proper and timely screening can prevent this cancer and its complications. The present study aims to assess the cervical cancer screening status in women referring to comprehensive health centers in Khorramabad, Iran.

**Methods:** A total of 457 married women aged 18-60 years, who referred to health centers in Khorramabad city, were included in this cross-sectional study using a multi-stage (stratified-cluster-random) sampling method. Information on demographic characteristics, pregnancy history, cervical cancer screening status, including taking or not taking screening tests so far, frequency and intervals of screening and the reason for not taking screening tests were collected using a multi-part questionnaire. The data were analyzed using the independent t-test and one-way analysis of variance (ANOVA).

**Results:** The mean age of participants in the study was  $36.1 \pm 9.69$  years. About 66.7% of the participants stated that they had the history of taking at least one Pap smear (Papanicolaou smear) by the time of the study. The age of first Pap smear in most participants was 25-29 years and the frequency of taking a Pap smear test in most cases (28.9%) was once. Most participants reported that they did not take Pap tests because they were unaware of the importance and necessity of taking a Pap smear test. The frequency of Pap smear screening in the women surveyed was statistically significant by age ( $PV=0.001$ ), education level ( $PV<0.001$ ), occupation ( $PV=0.001$ ), and place of residence ( $PV=0.001$ ).

**Conclusion:** The level of awareness and subsequently cervical cancer screening frequency can be increased in women of the community with proper planning and training women in the community at various levels, including the comprehensive health center.



## Introduction

Worldwide there have been 885193 new cases and 311365 deaths from cervical cancer in 2018. In Asia, there were 315,346 new cases and 168,411 deaths [1]. Cervical cancer is the fourth most common cancer in women worldwide, the third most common cancer in women in Asia, and the most common cancer type in women in half of sub-Saharan African countries. South Africa has reported the highest age-standardized incidence rate (ASR) of cervical cancer (43.1 per 100000) [2]. The incidence of cervical cancer has significantly declined since the 1960s due to the implementation of extensive population screening programs in developed countries, such as the United Kingdom and the United States [3, 4]. In contrast, the incidence of this cancer in developing countries is still on a rise owing to the lack of effective screening programs at the population level, insufficient awareness of disease prevention strategies, unfair access to health services, and poverty and low socio-economic status [5, 6].

Using various screening methods, many attempts have been made across the world to prevent the incidence of cervical cancer as much as possible. Screening is among the methods designed to detect precancerous changes that, if left untreated, can lead to cervical cancer. There are currently several tests that can be used to screen for cervical cancer. Cytology is the most commonly used test that can significantly lower the incidence of cervical cancer and cancer-related mortality all around the world [7]. Despite advances obtained in cervical cancer screening and therapy over the past few decades, it still remains one of the major health problems in Iranian women. Additionally, various studies have shown that women face numerous socio-cultural, religious, geographic and economic barriers to get access to Pap smear services [8, 9]. Due to the importance of the effect of cancer on different aspects of quality of life and considering that the factors affecting cervical cancer screening behaviors vary from one community to another one, and different societies are different in terms of socio-cultural and economic factors, the present study was designed to assess the status of cervical cancer screening in women referring to comprehensive health centers in Khorramabad (West Iran).

## Methods

This cross-sectional study was conducted on 457 married women aged 18-60 years under the coverage of comprehensive health centers in Khorramabad in the first half of 2020. Inclusion criteria were having a history of marriage, being in the age range of 18-60 years and the residence of Khorramabad city or its suburbs and giving informed consent to participate in the research. The research sample was selected using a stratified-

cluster-random (multi-stage) sampling method. First, Khorramabad city was divided into three classes (regions): north, central, and south regions. The comprehensive health centers were selected as the head clusters for each region. Three to five comprehensive health centers were then randomly selected from each region proportional to its population. Again, the women to be surveyed were selected from those aged 18-60 years referring to each center using a consecutive (convenience) sampling method and interviewed. According to the ratio estimation formula and considering the type I error of 5%, the final sample size was calculated 457. The required data were gathered using a multi-part questionnaire. The first part of this questionnaire includes items asking about demographic data, such as age, marital status, education level, place of residence, occupation, etc. The items in the second part were related to the pregnancy history, including age at first marriage, number of pregnancies, number of childbirths, number of children, contraception methods, the woman or her first-degree relatives' history of cervical cancer, etc. The third part of the questionnaire included items about taking or not taking cervical cancer screening test. A multiple-choice item about the reason for not performing screening was also provided at the end of the questionnaire. After obtaining the ethics committee approval, the researchers went to the comprehensive health centers and interviewed the eligible individuals. The collected data were analyzed using SPSS software version 21. Descriptive statistical methods (mean, standard deviation, ratios, and percentages) were used to describe the data and independent t-test, one-way analysis of variance (ANOVA), and logistic regression were used for data analysis.

## Results

A total of 457 married women aged 18-60 years, who referred to health centers in Khorramabad city, were studied in terms of the screening status of cervical cancer and factors related to it. The mean age of the participants in the study was  $36.1 \pm 9.9$ . Most participants (35%) were in the age range of 30-39 years. The majority of the research participants had academic education (57.3%). Considering the occupational status, 59.3% of the research participants were housekeepers. About 88.2% and 11.8 % of the studied persons lived in urban and rural regions, respectively (Table 2).

About 4.4% of participants had a history of regular smoking. Three (3.3%) of the study participants reported a history of cervical cancer. The first-degree relatives' (mother and sister) history of cervical cancer was reported by 15 (3.3%) participants. The age of onset of menstruation was 13 years and over in 77.25% of participants. Of the total participants in the study, 63

(13.8%) had menopause and the age of menopause in the majority of them was 45-49 years.

Type of variable	Relative frequency Percentage	Cumulative frequency Percentage	Absolute frequency Number
Having the history of taking a Pap smear test at least once until now			
Positive	305	66.7	66.7
Negative	152	33.3	100
Age of first Pap smear:			
25>	19	6.2	6.2
25-29	125	41	47.2
30-34	56	18.4	65.6
35 ≤	105	34.4	100
Frequency of Pap smear screening so far:			
Once	88	28.9	28.9
Twice	69	22.6	51.5
Three times	49	16.1	67.6
Four times	73	23.9	91.5
Five times and more	26	8.5	100
Time period between marriage and first time taking Pap smear:			
Less than 5 years	146	47.9	47.9
3-5 years	49	16.1	64
More than 5 years	110	36	100
Time period between two Pap smear tests so far:			
Annually	97	31.8	31.8
Every 3 years	75	24.6	56.4
Every 4-5 years	42	13.8	70.2
More than 5 years	91	29.8	100

Table 1: Frequency distribution of cervical cancer screening status in subjects.

Type of characteristic	Frequency Number (percent)	Performing cervical cancer screening			P- value
		Yes Number (percent)	No Number (percent)	Total Number (percent)	
Age groups:					<0.001
30>	151(33.1)	75(49.7)	76(50.3)	151(100)	
30-39	160(35)	120(75.5)	39(24.5)	159(100)	
40 ≤	146(31.9)	110(75.3)	36(24.7)	146(100)	
Marital status:					0.734
Married	421(92.1)	280(66.7)	140(33.7)	420(100)	
Divorced or widow	36(7.9)	25(69.4)	11(30.6)	36(100)	
Education level:					<0.001
Illiterate	21(4.6)	8(38.1)	13(61.9)	21(100)	
Guidance school and lower	62(13.6)	30(48.4)	32(51.6)	62(100)	
High school and diploma	112(24.6)	72(64.3)	40(35.7)	112(100)	
Academic education	262(57.3)	195(74.7)	66(25.3)	261(100)	
Occupation:					0.03
Housekeeper	271(59.3)	168(62.2)	102(37.8)	270(100)	
Worker	9(2)	6(66.7)	3(33.3)	9(100)	
Employee	148(32.4)	113(76.4)	35(23.6)	148(100)	
Self-employed	29(6.3)	18(62.1)	11(37.9)	29(100)	
Place of residence					<0.001
Urban region	403(88.2)	287(71.4)	115(28.6)	402(100)	
Rural region-	54(11.8)	18(33.3)	36(66.7)	54(100)	

Table 2: Frequency distribution comparison of cervical cancer screening status by demographic characteristics of the study participants.

Of the total persons under coverage, 78.1% reported having a history of pregnancy and childbirth. The age of the last pregnancy in women with a history of pregnancy was in most cases (30%) between 30 and 34 years. The majority of participants (39.4%) reported to be below 20 years of age at first marriage. About 66.7% of the participants reported having a history of taking a Pap smear test at least once. The age of the first Pap smear in those who had a history of Pap smear was 35 years and over in most cases (34.4%). The frequency of Pap smear was once in the majority of participants with a history of Pap smear test (28.9%). The majority of participants with a history of Pap smear (31.8%) underwent Pap

smear screening annually (Table 1). The average number of Pap smears in the subjects was 3.48 times. The minimum number of Pap smears was 1 and the maximum was 16 times. The mean number of Pap smears performed by women under study was 3.48+3 times. The minimum and the maximum number of Pap smears was reported 1 and 16, respectively.

The frequency distribution comparison of cervical cancer screening status is shown in Table 2 by demographic characteristics of study participants. According to the results shown in this table, statistically significant differences between the age groups were found in frequency distribution of performing cervical cancer screening ( $p < 0.001$ ). No statistically significant differences in frequency distribution of performing cervical cancer screening ( $p = 0.734$ ) were observed between marital status groups.

Variable type	Exp (B)	df	wald	SE	B	P-value
Education rate	0.604	1	11.1	0.152	- 0.505	0.001
Job	1.018	1	0.033	0.096	0.018	0.855
Address	2.127	1	3.978	0.378	0.775	0.046
Age	0.521	1	21.208	0.141	- 0.651	<0.001

Table 3: Logistic regression analysis to evaluate the predictive factors of cervical cancer screening in the subjects

Reasons for not taking a Pap smear test	Absolute frequency Number	Relative frequency Percentage	Cumulative frequency Percentage
Being unaware of the importance and necessity of Pap smear	128	28	28
Not having opportunity	85	18.6	46.6
Fear of injury when undergoing the test	15	3.3	49.9
Not affording the cost of taking a Pap smear test	14	3.1	53
Not paying attention to their health	56	12.3	65.3
Anxiety about having a Pap smear	50	10.9	76.2
Feeling ashamed and embarrassed about the test	39	8.5	84.7
Lack of proper access to Pap smear centers	27	5.9	90.6
Other reasons	10	2.2	92.8

Table 4: Frequency distribution of reasons for not taking a Pap smear test from the participants' point of view

Considering the relationship between the education level and performing cervical cancer screening in the study participants, only 38.1% of illiterate individuals and 48.4% of the individuals with guidance school education and lower had a history of screening for cervical cancer, while 74.7% of the individuals with academic education reported they had a history of Pap test at least once. According to the Chi-square test, this difference was statistically significant ( $p < 0.001$ ). Moreover, the difference in the frequency distribution of performing cervical cancer screening was statistically significant between the occupational groups. The highest and the lowest rate of screening was observed in employees (76.4%) and self-employed women (62.1%),

respectively. The difference in the frequency distribution of performing cervical cancer screening was also statistically significant in terms of the place of residence (Table 2). The difference in the frequency distribution of performing cervical cancer screening was statistically insignificant between the participants in terms of the first-degree relatives' history of cervical cancer ( $p=0.595$ ), self-previous history of cervical cancer ( $p=0.212$ ), and history of smoking ( $p=0.43$ ).

Table 3 shows the results of logistic regression analysis used to determine the predictors of cervical cancer screening in the subjects, and all cervical cancer screening-related variables in univariate analysis were included in the model. According to the multivariate model, the effect of occupation on cervical cancer screening, which was significant in univariate analysis, was insignificant in multivariate analysis. But the effect of other variables, such as education level, place of residence, and age was also significant in multivariate analysis. Therefore, education level ( $p=0.001$ ), place of residence ( $p=0.046$ ), and age ( $p<0.001$ ) were three important predictive factors for performing cervical cancer screening in this study (Table 3). Finally, Table 4 shows in detail the frequency distribution of the reasons for not taking a Pap smear from the perspective of the subjects. According to the results of the above table, being unaware of the importance and necessity of Pap smear test (28%) and not having the opportunity to perform it (18.6%) were the most common reasons for not taking Pap smear from the participants' point of view. Not paying attention to their health was the reason for not taking the test stated by about 12.3% of the participants, and about 10.9% reported that fear of pain when undergoing the test was the reason. The frequency distribution of other reasons for not taking a Pap smear test from the participants' point of view is shown in detail in Table 4.

## Discussion

Hamedan, and 49.4% of women in Tabriz reported that they had a history of taking the test at least once [11-13]. Perhaps one of the reasons for the higher percentage of taking a Pap smear test in the present research compared to other studies is due to the implementation of Iran's Package of Essential Noncommunicable Diseases (IraPEN) Program. This program was implemented widely in Iran over recent years. One component of IraPEN program is cervical cancer screening for high risk 30-59-year-women or those with suspicious clinical symptoms. These women are identified and presented to the predetermined centers for cervical cancer screening. The situation is similar in other developing countries as well such that in a study in Rwanda in 2017, only 13.3% of asymptomatic women were referred for screening [14]. In a study by Assoumou

et al. in 2015, out of 27.9% of participants who had heard of Pap smear test, only 65.1% had taken the test. They reported that the most important reason for this low frequency is that the women lacked the knowledge about cervical cancer screening importance and necessity [15]. Of all women who took a Pap smear in the present study, about 29% had taken the test only once, and only one-third of those who had taken the test had repeated it at standard intervals [10]. In a study in 2015 in Qom, Mohebi et al. found that 51.87% of participants had irregularly participated in cervical cancer screening programs [16]. In other countries, however, the results of repeating the Pap test at standard intervals were inconsistent. For example, 48.8% of women in a study by Assoumou et al. had taken the test once, 41.5% 2-3 times, and 9.8% more than three times [15]. Moreover, in their study in 2017 in the United States, Akinlotan et al. found that 46% of women did not have a history of performing cervical cancer screening over the past year [17]. However, unlike the present study, the majority of women in Chorley et al.'s study had participated in the screening program at least once [18]. Moreover, in a cross sectional study in the United States, Kasting et al. found that 84% of their research participants had taken a Pap test over the past 3 years [19]. The reason for the inconsistency with our study can be attributed to the participants' high level of awareness and different socio-economic and cultural conditions of our country as compared to the above mentioned countries. In this study, the age of the first Pap test in most cases was 25-29 years and the time period between marriage and the first Pap test was less than 3 years in the majority of cases, but about one-third (36%) of participants reported that the time period between their marriage and the first Pap test was more than 5 years. The mean age of the first Pap test and the time period between the marriage and the first test in Sharifi et al.'s study in Asadabad was  $26.4\pm 6.5$  and  $5.2\pm 6.9$  years, respectively [10]. The higher frequency of taking the test in younger women seems to be due to more referrals to comprehensive health centers to receive maternal and child services. Cervical cancer screening status in this study varied based on the participants age, education level, occupation, and place of residence, and the highest frequency of taking a Pap smear test was observed in women with academic education. In a study by Gu et al. in 2013, the majority of women who were willing to undergo screening in the future were married and had academic education [20]. Usually, women with higher education acquire further information about health-related screening behaviors through various media, especially the Internet. In the present research, the highest screening frequency was related to the age group of 30-39 and above 40 years, which had a statistically significant difference with that of the 30-

year-old women. The reason can be attributed to the issue that women in the older age group pay more attention to their health status and adopt health-related behaviors. In our study the screening frequency was higher in employees compared to women in other jobs. In another study in 2017, Mbachu et al. found that following education about screening, the rate of performing screening increased more in employees [21]. Moreover, in a study in 2013, Demirtas et al. found that 50% of employees had taken a Pap smear test over the past 6 months and the employees faced fewer barriers to taking the test [22]. Moreover, the findings of this study showed that the most important reasons for not taking or irregularly taking a Pap test were being unaware of the importance and necessity of taking the test, having no opportunity to take the test, not paying attention to their health, fear of pain when undergoing the test, etc. therefore, the level of awareness and subsequently the screening rate can be increased in the community's women with proper educational programming at different levels, namely comprehensive health centers. Low awareness of women about the necessity of taking a Pap smear test can indicate the fact that there is no comprehensive education program in our country to inform about cervical cancer and Pap smear test and the maternal health care system lacks this debate. The results from this study indicated the undesirable performance of the community's women regarding taking a Pap smear test and awareness about its necessity, and it must be improved through education and making women sensitive to the issue and the benefits of early detection of the disease. As healthcare personnel are an important source of information for women, their role in raising the women's awareness level is thus evident. By minimizing the cost of a Pap smear test and even making it free of charge for low-income or middle-income groups, community health care providers seem to be able to make it possible for all segments of society to take the test. Among limitations of this study was gathering data from women who referred to healthcare centers to receive services and future researchers had better collect data from the community level. This will lead to a more appropriate analysis of health behaviors.

From this study, we concluded that parasitism is a major health problem for camels because parasites get food and shelter from the host and cause disease. This research shows the high prevalence rate of nematohelminthes of different species. In this research area, people use camels for meat and draught purpose. This study shows the high attack of gastrointestinal nematohelminthes on camels and their production is used as food by people. For this purpose, it is suggested that deworming should be done properly after regular intervals with safe and low cost effective anthelmintic

drugs (Albendazole, levamisole and Ivermectin). Farmers should be educated through the trained team of the Camel Center to assess the aspects of camel health, management and breeding. Due to the high cost of anthelmintic drugs and checkup fees of veterinarians poor owners do not connect with them and destroy the health of animals which causes a huge earning loss.

## Competing Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

## Author Contributions

All authors contributed equally to this study.

## References

- Salih H, Salih A, Ahmed R. Bioactivity of Cymbopogon Citratus aqueous extract against measles virus and some bacterial isolates. *Caspian Journal of Environmental Sciences*, (2022); 20(3): 585-592.
- International Agency for Research on Cancer(IARC). GLOBOCAN <http://gco.iarc.fr/tomorrow/home> (2018).
- Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *International Journal of cancer*, (2020); 127: 2893-2917.
- Huh WK, Ault KA, Chelmow D, Davey DD, Goulart RA, Garcia FA et al. Use of primary high-risk human papillomavirus testing for cervical cancer screening: interim clinical guidance. *Gynecologic Oncology Reports*, (2015); 136: 178-182.
- Isa Modibbo F, Dareng E, Bamisaye P, Jedy-Agba E, Adewole A, Oyenehin L. et al. Qualitative study of barriers to cervical cancer screening among Nigerian women. *BMJ Open*, (2016); 6: e008533.
- Khalili Tanha, G., Barzegar, A., Shokrzadeh, M., Nikbaksh, N., Ansari, Z. Correlation between serum concentration of diazinon pesticide and breast cancer incidence in Mazandaran Province, northern Iran. *Caspian Journal of Environmental Sciences*, (2020); 18(3): 197-204.
- Arbyn M, Raifu AO, Weiderpass E, Bray F, Anttila A. Trends of cervical cancer mortality in the member states of the European Union. *European Journal of Cancer*, (2009);45: 2640-2648.
- Refaei M, Dehghan Nayeri N, Khakbazan Z, Pakgozar M. Cervical Cancer Screening in Iranian Women: Healthcare Practitioner Perceptions and Views. *Asian Pacific Journal of Cancer Prevention*, (2017); 18(2): 357-63.
- HSalih, A., H Salih, R., Y Ahmed, H. Bioactivity of Cymbopogon Citratus aqueous extract against measles virus and some bacterial isolates. *Caspian Journal of Environmental Sciences*, (2022); 20(3): 585-592.
- Sharifi M, Mohammadi Z, Makvandi Z, Rostami P, Moradi A. Assessment of cervical cancer screening and its barriers in 18-50 year old women referring to Asad Abad comprehensive health centers. *Planetary Science Journal*, (2018); 16 (2): 35-45.
- Farzaneh E, Heydari H, Shekarchi A, Kamran A. Breast and cervical cancer-screening uptake among females in Ardabil, northwest Iran: a community-based study. *Oncotargets and Therapy*, (2017);10 :985-92
- Bakht R, Shobairi F, Roshanaei GH, Fakori E. Factors Affecting the Screening of Cervical Cancer in Addicted Women in Hamadan in 2017: Based on the Model of Protection Motivation Theory. *Hakim Seyed Esmail Jorjani Journal*, (2017); (2)4: 1-3.
- Mussavi, M., Asadollahi, K., Janbaz, F., Mansoori, E., Abbasi, N. The evaluation of red reflex sensitivity and specificity test among neonates in different conditions. *Iranian Journal of Pediatrics*. 2014; 24(6): 697.

14. Ruzigana G, Bazzet-Matabele L, Rulisa S, Martin AN, Ghebre RG. Cervical cancer screening at a tertiary care center in Rwanda. *Gynecologic Oncology Reports*, (2017); 21: 13-6.
15. Assoumou SZ, Mabika Mabika B, Mbiguino AN, Mouallif M, Khattabi A, Ennaji M. Awareness and knowledge regarding of cervical cancer, Pap smear screening and human papillomavirus infection in Gabonese women. *BMC Women's Health*, (2015); 15(37):1-7.
16. Mohebi S, Sharifirad G, Gharlipour Z, Kamran A. The Study of Pap Smear Conduction and its Related Factors Based on Health Belief Model in Women Referring to Health Care Centers in Qom During 2014. *Journal of Education and Community Health*, (2016); 2 (4): 25-33.
17. Akinlotan M, Bolin JN, Helduser J, Ojinnaka C, Lichorad A, McClellan D. Cervical Cancer Screening Barriers and Risk Factor Knowledge Among Uninsured Women. *Journal of Community Health*, (2017); 1-12.
18. Chorley AJ, Marlow LAV, Forster AS, Haddrell JB, Waller J. Experiences of cervical screening and barriers to participation in the context of an organised programme: a systematic review and thematic synthesis. *PsychoOncology*, 2017; 72; 161.
19. Kasting ML, Wilson S, Zollinger TW, Dixon BE, Stupiansky NW, Zimet GD. Differences in cervical cancer screening knowledge, practices, and beliefs: An examination of survey responses. *Preventive Medicine Reports*, (2017); 5: 169-74.
20. Gu C, Chan CWH, He GP, Choi KC, Yang SB. Chinese women's motivation to receive future screening: The role of social-demographic factors, knowledge and risk perception of cervical cancer. *European Journal of Oncology Nursing*, (2013); 17: 154-61.
21. Mbachu C, Dim C, Ezeoke U. Effects of peer health education on perception and practice of screening for cervical cancer among urban residential women in southeast Nigeria: a before and after study. *BMC women's health*, (2017); 17(1): 41
22. Demirtas, B., Acikgoz, I. Promoting Attendance at Cervical Cancer Screening: Understanding the Relationship with Turkish Womens' Health Beliefs. *Asian Pacific Journal of Cancer Prevention*, (2013); 14(1): 333-40.



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