Factors related to the knowledge, attitudes and practices of opportunistic cervical cancer screening in I.R of Iran

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ABSTRACT

Background: Organized cervical screening program has led to prevention of cervical cancer prevention worldwide. Women's knowledge and attitudes is linked to their participation in cervical screening. We studied the knowledge, attitudes and practices (KAP) of women about cervical cancer prevention and the related factors in Tehran, I.R. of Iran.

Methods: Trained interviewers used a validated questionnaire to study KAP in healthy women about cervical cancer prevention. We studied association between women's knowledge and their attendance in cervical screening with different explanatory variables. We used logistic regression model for statistical analyses.

Results: We recruited 799 women in this study. The women's knowledge about cervical cancer prevention was positively associated with age at first pregnancy (P-value for trend 0.003). Illiterate women had %93 lower knowledge about cervical cancer and screening compared to highly educated women (OR=0.07, CI: 0.34 ,0.01). Women who were living in the northern part of the city (higher socio economic status (SES)) had about -2fold higher knowledge (OR=%95 ,0.42 CI: 0.64 ,0.30) and had a higher participation rate in screening (OR=%95 ,0.40 CI: 0.64 ,0.26) than women in the southern (lower SES) part of the city. Woman with a higher knowledge had about -2fold higher participation in the screening than those who had lower knowledge (OR=%95 ,1.90 CI: 2.70 ,1.30).

Conclusion: We found that higher women's knowledge, living in the high SES area, and higher academic education were statistically associated with attendance to screening. Tailored health promotion program for public awareness may increase the attendance in cervical screening.

Key words: Knowledge, Attitudes, Practices, Cervical Cancer, Screening

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Introduction

Cervical cancer is the fourth most common cancer among women worldwide[1] in terms of incidence and mortality, representing 528,000 new cases every year and 266,000 deaths in 2012. About 70% of global burden falls in the lower levels of development areas, and more than one fifth of all new cases are diagnosed in India[1]. The highest Age Standardized Incidence Rate (ASR) of cervical cancer worldwide is reported in Africa and Central America, and the lowest ASR were reported in Western Asia, Australia, and North America[1]. The mean incidence and mortality rate of cervical cancer in the developing countries is almost twice of developed countries. Delayed in diagnosis and inadequate treatment of cervical cancer contribute to this higher mortality to incidence ratio in developing countries compared to the developed countries[2]. Studies on the natural history of cervical cancer have shown that dysplastic precursor lesions progress steadily from mild to moderate to severe dysplasia, then lead to carcinoma in situ, and finally lead to cervical cancer[3-5]. This process takes decades, making cervical cancer as a suitable disease for screening[6-7]. In high income countries the incidence rate of cervical cancer decreased significantly in the last decades because of the organized screening programs[1]. Likewise, screening program decreased the incidence rate of cervical cancer in some high risk area, including China, Taiwan, Korea, and India[8-12], although this reduction was much smaller than the high income countries[13]. Persistent infection with oncogenic types of human papilloma virus (HPV) is necessary cause of the cervical cancer occurrence[14-17]. The most frequent oncogenic subtypes for HPV are 16 and 18, which account for developing 70% of cervical cancer cases worldwide[5]. Due to the high prevalence of HPV infections and lack of organized screening programs, the burden of cervical cancer is high in most of the developing countries. High quality organized cervical cancer screening programs have rarely been implemented and virtually never sustained in the most developing countries[3,18]. Among the screening programs that have been introduced, many of these programs have had very poor quality and low coverage rate, with little financial support[19,20].

Based on population-based cancer registry in I.R of Iran, the ASR of cervical cancer was 5.4 per 100,000 in Golestan province in 2013[21]. The prevalence of HPV infection was estimated 7.8% in the general female population, and the HPV infection was found in 80% of the cervical cancer patients, and the most prevalent oncogenic HPV types were types 16 and 18[22].

In I.R of Iran and several other countries with a relatively low incidence rate of cervical cancer, prevention is not prioritized, and there is no organized screening program for this cancer. Therefore, cervical cancer patients are often diagnosed in the advanced stages[6]. In these countries the current screening programs are opportunistic, and women undertake screening test only if themselves or their clinicians take the initiative to screening test, and if the women can afford the costs of the screening test and eventual follow-up. In such settings, the regular usage of pap-smear test depends on the knowledge, and attitudes of women about the screening and cervical cancer prevention[23]. In this study, we evaluated women's knowledge, attitudes and practices about cervical cancer and pap-smear screening test in the capital city of Tehran, I.R. of Iran, a low incidence area that provide cervical screening opportunistically; i.e. usually women with high socioeconomic status and those who visit gynecologists may attend cervical screening. In addition, the women with low SES who are aware of the cervical cancer risks and benefit of cervical screening may attend the screening programs.

Methods

We conducted a cross sectional study. In order to select a representative sample of women living in Tehran city, we used cluster sampling methods and selected the research subjects from different parts of the city. We identified all private and public general hospitals in the north, south, west and east in Tehran city, and then randomly selected two hospitals from each area. Finally, in the 8 selected hospitals we interviewed healthy women who were visiting patient in these hospitals. We recruited married women from all the age groups between 25 to 70 years old. In addition, the women should have lived in Tehran for about 5 years. In total 1038 women who were invited to participate in this survey, and we interviewed 799. The response rate was 77% and 239 (23%) women declined to participate in this study because of different reasons including cultural issues and sensitivity to the research questions, being busy, illiteracy and difficulties for communication with the interviewer. We used a standardized questionnaire. The validity of the questionnaire was described in detail elsewhere[24]. Questionnaire composed of three parts, including women's knowledge, attitudes, and history of participation in cervical screening. We considered the women's knowledge as the binary response and base on the provided answer the women scored as the positive (score=1) and negative or null answer (score=0) about cervical cancer and the screening test. For each woman, we summed up the scores and estimated a total knowledge score. Women were categorized into good and weak knowledge according to the median value of the overall knowledge score. The median of women's knowledge was 47 (range between 39 and 55). We considered the knowledge score equal or more than 47 as the good knowledge and the score less than 47 as the weak knowledge. All questions were asked by trained interviewer in a confidential setting. We avoided asking sensitive questions, including history of extra-marital sex, due to the religious and cultural barriers. Participants singed a written inform consent and we ensured them that their data will be kept confidential. The ethics committee of Tehran University of Medical Sciences approved the study protocol and the study instruments (90-03-51-15230). The study was conducted from May 2012 until July 2012 in Tehran, I.R. of Iran.

The attitudes questions had five-option answer based on Likert scale[25], including strongly agree, agree, no comment, disagree and strongly disagree. The practice question was about women participation in the screening program during the last five years. Based on this part women's who participated in screening program less than 5 years ago were assumed to be screened and the remaining women were categorized as non-screened.

Statistical analysis:

We studied association of women's knowledge status (good versus weak) with the marital status, age, first pregnancy age, job, location and education. In addition, we studied association between attendances to screening with the above explanatory variables.

We used logistic regression model to estimate odds ratio (OR) and corresponding 95% confidence interval (95% CI). Factors significantly related to knowledge/practice and their p-value was 0.2 or less were entered in to the backward stepwise multiple logistic regression model[26]. Moreover, we did co-linearity test to select appropriate variable in the logistic

regression model. In addition, we performed the likelihood ratio test for goodness of fit of the logistic regression model. We excluded variables which their p-value was more than 0.2 from the model. We used STATA statistical software version11 to perform the statistical analyses. Results of the crude and adjusted regression model were presented.

Result

In overall, we recruited 799 women in this study. The mean age was 39.8 years old (SD12.5±). Almost %92.0 of them were currently married woman and more than %80 of them were housewives. In this study the median of women's knowledge was 47 (range between 39 and 55). Furthermore, 9382 %47.70)) women had good knowledge about cervical cancer and the screening. The univariate analyses revealed that marital status, age, first pregnancy age, education and residential place were significantly associated with the women's knowledge about cervical cancer. Based on the goodness of fit, all these variables remained in the final multivariate logistic model. In the multivariate logistic model, there was significant association increasing trend by age at first pregnancy and the women's knowledge about cervical cancer prevention (P-value for trend=0.003). The odds ratio of knowledge was higher among women who has an age at first pregnancy of 22-19 year (OR=,1.80 %95 CI: 26-22 ,(1.03,3.00 years (OR=%95 ,1.80 CI: 1.03,3.00) , more than 26 years (OR=%95 ,1.80 CI: 1.03,3.00) and women with unknown age at first pregnancy (OR=%95 ,1.80 CI: 1.03,3.00) compared to the women who had an age at first pregnancy lower than 19 years old. In addition, women´s education was positively associated with the women's knowledge about cervical cancer prevention. The illiterate women, and those with a primary, and high school education had %93 (OR=0.07, CI: %57 ,(0.34 ,0.01 (OR=%95 ,0.43 CI: 0.82 ,0.22), and %59 (OR=%95 ,0.43 CI: 0.80 ,0.22) lower knowledge compared to the women with academic training. However, there was no significant difference between diploma and academic education vis-à-vis women's knowledge about cervical cancer prevention, and the increasing trend was not statistically significant in the multivariable model. Women who lived in the southern, eastern and western part of Tehran city had about 50-60% lower knowledge compared to those who were living in the northern part of the city, which is a relatively high socioeconomic area compared to other parts (Table1).

Based on attitude questions, 198 (25.40%) of women had no comment about this phrase: "pap-smear is expensive". In addition, 412 (53%) of them believed that pap-smear testing was painful. Moreover, 422 (55%) of women agreed that pap smear test was time consuming and 387 (50.90%) agreed that cervical screening disturb their privacy. About 40% of women (n=311) disagreed that pap-smear test is an effective way for early detection of cervical cancer and 56% (n=432) agreed that pap-smear test had no effect on cervical cancer prevention (Table 2).

The univariate analysis showed that marital status, age, first pregnancy age, education, location and women's knowledge about cervical cancer prevention were significantly associated with the attendance to screening. In the multivariate model, women with age at 30-39 years, 40-49 years had 2.15-fold (OR=2.15, 95% CI: 1.30, 3.70), and 1.5 fold (OR=1.5, 95% CI 0.84-2.52) higher rate of attendance to screening compared to women with age less than 30 years old However, further increase in age was negatively associated with attendance to screening. Women with ages of, 50-59 years, and those with an age of older than 60 years had lower rate of attendance to screening. However the latter figures were not statistically significant.

Women who lived in the southern part of Tehran had 60% lower attendance to screening (OR=0.40, 95% CI: 0.26, 0.64) compared to the residences of

Table 1: Crude and adjusted odds ratios (OR) and corresponding 95% confidence interval (CI) for association between women's knowledge (good versus weak) about cervical cancer prevention and different risk factors in 2012 in Tehran, Iran.

Variable	Total	Knowledge (%)	OR (Crude)	OR (Adjusted*)
Marital Status				
Married	729	357 (49)	Reference	Reference
Widow & Divorced	65	22 (33.9)	0.53 (0.31, 0.90)	0.84 (0.42, 1.70)
Missing	5	3 (60)		
Age Group				
<30	204	105 (51.5)	Reference	Reference
30-39	205	129 (62.9)	1.60 (1.10, 2.40)	1.80 (1.10, 2.90)
40-49	167	72 (43.1)	0.71 (0.50, 1.10)	1.45 (0.90, 2.50)
50-59	160	55(34.4)	0.50 (0.32, 0.80)	1.12 (0.62, 2.00)
>60	43	12 (27.9)	0.40 (0.20, 0.80)	1.10 (0.40, 3.13)
Missing	20	9 (45)		
P-value for trend			0.0001	0.9
First pregnancy age				
<19	183	38 (20.8)	Reference	Reference
19-22	218	92 (42.2)	2.80 (1.80, 4.40)	1.80 (1.03, 3.00)
22-26	211	133 (63)	6.50 (4.13, 10.24)	2.44 (1.40, 4.42)
>26	78	52 (66.2)	7.63 (4.23, 13.8)	2.61 (1.30, 5.40)
Unknown	109	67 (61.8)	6.10 (3.6, 10.3)	2.92 (1.40, 6.13)
P-value for trend			0.0001	0.003
Job				
Housewife	693	310 (44.7)	Reference	Reference
Employed	99	70 (70.7)	3.00 (1.90,4.71)	1.93 (1.10, 3.40)
Missing	7	2 (28.6)		
Education				
Illiterate	45	4 (8.9)	0.04 (0.01, 0.12)	0.07 (0.01, 0.34)
Primary	130	36 (27.7)	0.20 (0.10, 0.30)	0.43 (0.22, 0.82)
High school	136	38 (27.9)	0.20 (0.10, 0.30)	0.41 (0.22, 0.80)
Diploma	332	197 (59.3)	0.62 (0.41, 0.94)	1.02 (0.62, 1.70)
College	150	4 (70)	Reference	Reference
Missing	6	2 (33.3)		
P-value for trend			0.03	0.9
Location				
North	227	150 (66.1)	Reference	Reference
South	366	136 (37.2)	0.30 (0.21, 0.43)	0.42 (0.30, 0.64)
East	87	42 (48.3)	0.50 (0.30, 0.80)	0.45 (0.25, 0.80)
West	115	53 (46.1)	0.44 (0.30, 0.70)	0.50 (0.30, 0.84)
Missing	4	1 (25)		

*Adjusted OR: Adjusted for marital status, age, first pregnancy age, job, education and location

high socioeconomic area in the northern part of Tehran. While there was no significant association between the east and north of Tehran, women who lived in the western part of Tehran had %58 lower attendance to screening (OR=%95 ,0.42 CI: ,0.24 0.80) compared to those lived in the north of Tehran. Furthermore, woman who had higher knowledge about cervical cancer prevention had almost 2 fold higher attendance to screening compared to those who had lower knowledge (OR=%95 ,1.90 CI: 2.70 ,1.30) (Table 3). There was no significant association between the first pregnancy age and attendance to screening in the final regression model.

Discussion

In this study we showed that less than half of women

Table 2: Attitude of Iranian women about cervical cancer and pap-smear screening in 2012 in in Tehran, I.R of Iran.

Statement	Strongly agree N (%)	Agree N (%)	No comment N (%)	Disagree N (%)	Strongly disagree N (%)
Doing pap-smear is expensive	56(7.20)	403 (5.70)	198 (25.40)	73 (9.40)	44 (5.70)
It is painful to have a pap-smear	70 (9.10)	412 (53.40)	177(22.90)	97 (12.60)	16 (2.10)
It is time consuming to go and have a pap-smear	88 (11.50)	422 (55.00)	155 (20.20)	98 (12.80)	5 (0.70)
Performing pap-smear test disturb privacy of women	78 (10.30)	387 (50.90)	185 (24.30)	92 (12.10)	19 (2.50)
Pap-smear test is effective in early detection of cervical cancer	5 (0.70)	22 (2.90)	160 (20.80)	311 (40.50)	270 (35.20)
Pap-smear is not effective for cervical cancer prevention	83 (0.90)	432 (56.60)	207 (27.10)	26 (3.40)	15 (2.00)
prefer doing pap-smear test before experiencing cervical cancer symptoms	4 (0.50)	24 (3.10)	139 (18.10)	298 (38.80)	304 (39.50)
Pap-smear test is not necessary in asymptomatic individuals.	105 (13.30)	399 (51.70)	217 (28.10)	46 (6.00)	7 (0.90)
Equipment of the pap-smear test does not have good quality.	69 (8.90)	321 (41.50)	311 (40.20)	61 (7.90)	12 (1.60)

(47.81%) in the capital city of Tehran had good knowledge about cervical cancer prevention. This is in line with other studies in I.R. of Iran, which also indicated that women›s knowledge about pap-smear is very low. Since Hadi et al. showed that women knowledge about cervical cancer was 45.4%[27]. In addition, Jalalvandi et al. showed that less than half of women were aware of the Pap test[28]. This was lower than the results from the rate of knowledge reported from Vietnam-American women among whom 74% of women knew cervical cancer and the screening test[29]. In Sweden, 95% of women were aware of the purpose of screening program; however, only 62% of them knew that pap-smear test was used for detection of cervical cancer[30].

Table 3: Crude and adjusted odds ratios (OR) and corresponding 95% confidence interval (CI) for association between attendance to screening and different risk factors in 2012 in Tehran, I.R of Iran.

Variable	Total (N=799)	Screened (%) (N=513, 0.64%)	OR (Crude)	OR (Adjusted**)
Marital Status				
Married	729	477 (65.4)	Reference	Reference
Widow & Divorced	65	32 (49.2)	0.5 (0.30, 0.85)	1.00 (0.50, 1.85)
Missing	5	4 (80)		
Age Group				
<30	204	136 (66.7)	Reference	Reference
30-39	205	161 (78.5)	1.83 (1.20, 2.84)	2.15 (1.30, 3.70)
40-49	167	110 (65.9)	1.00 (0.62, 1.50)	1.50 (0.84, 2.52)
50-59	160	82 (51.3)	0.52 (0.34, 0.80)	0.90 (0.50, 1.54)
>60	43	15 (34.9)	0.30 (0.13, 0.53)	0.60 (0.23, 1.60)
Missing				
P-value for trend			0.0001	0.10
First pregnancy age				
<19	183	89 (48.6)	Reference	Reference
19-22	218	134 (61.5)	1.70 (1.13, 2.50)	1.04 (0.64, 1072)
22-26	211	155 (73.5)	2.92 (1.91, 4.50)	1.00 (0.54, 1.81)
>26	78	57 (72.7)	2.90 (1.61, 5.11)	0.84 (0.40, 1.80)
Unknown	109	78 (71.8)	2.70 (1.60, 4.41)	1.42 (0.53, 2.44)
P-value for trend			0.0001	0.90
Job				
Housewife	693	443 (63.9)	Reference	Reference
Employed	99	68 (68.7)	1.24 (0.80, 1.94)	0.72 (0.40, 1.30)
Missing	7	2 (28.6)		
Education				
Illiterate	45	8 (7.8)	0.05 (0.02, 0.12)	0.09 (0.03, 0.30)
Primary	130	68 (52.3)	0.30 (0.20, 0.45)	0.40 (0.20, 0.71)
High school	136	76 (55.9)	0.30 (0.20, 0.51)	0. 50 (0.30, 1.00)
Diploma	332	239 (71.8)	0.62 (0.42, 0.98)	0.70 (0.40, 1.21)
College	150	121 (80.7)	Reference	Reference
Missing				
P-value for trend			0.003	0.80
Location				
North	227	177 (77.8)	Reference	Reference
South	366	198 (54.1)	0.33 (0.23, 0.50)	0.40 (0.26, 0.64)
East	87	66 (75.9)	0.90 (0.50, 1.60)	1.05 (0.53, 2.10)
West	115	70 (60.9)	0.44 (0.30, 0.72)	0.42 (0.24, 0.80)
Missing	4	2 (50)		
Knowledge				
Weak	417	221 (53)	Reference	Reference
Good	382	292 (76.4)	2.90 (2.12, 3.90)	1.90 (1.30, 2.70)

**Adjusted OR: Adjusted for marital status, age, first pregnancy age, job, education, location and knowledge

In our study, knowledge of illiterate women was 91% lower than women with academic education. Our results were supported by other studies from Iran which showed that 93.3% Iranian women with academic education had sufficient information about cervical cancer risk factors and screening program[31]. Similar findings were reported from other countries and showed that educated women had more knowledge about cervical screening and cancer[29,32]. These findings emphasize that formal education is highly linked to the women's knowledge about cancer prevention.

In this survey, 64.21% of women reported that they had undergone cervical screening (Pap smear) at least once during the last five years. Other studies in I.R. of Iran showed that the participation of women in the screening is considerably lower than our findings[27,33,34]. For instance, Rezaie-Chamani et al. showed that 27.1 % of women did Pap-smear test at least once during their life[33]. Moreover, Soltan Ahmadi et al. reported that 27% of women participated in Pap smear test[34]. As we reported the attendance to screening depends on the age, residential place, socioeconomic status, and women's education, then variation in the screening practice from different part of the country could be interpreted cautiously and should be adjusted for the confounding variables.

After adjustment for age, we found that age at first pregnancy was positively associated with women's knowledge about cervical cancer prevention. Women with a first pregnancy age at 19-22 had better knowledge compared to those who had been pregnant for the first time at younger age. Lower age at first pregnancy with increasing the number of pregnancies are considered as a cervical cancer risk factors[35-38] In this study, after adjustment for the education and residential place as proxies for SES, the association between age at first pregnancy and the women's knowledge materially changed toward the null. However, the odds ratio was still higher than one. The remaining association could be due to the residual confounding by socioeconomic status and more data on SES needed to verify the reason for this association.

The knowledge and practice about cervical cancer prevention was higher among women who were living in the northern part of Tehran. In general, people who are living in the northern part of Tehran have a higher socioeconomic status compared to other part of the city. This finding was in line with the previous reports from Rohani-Rasaf et al. that measured socioeconomic disparities in cancer incidence in Tehran and reported that cervical cancer cases accumulated in the low socioeconomic group[39]. Several studies have shown that the socioeconomic disparities is associated with lower attendance to cervical screening[40,41], higher incidence and mortality of cervical cancer[42,43]. In addition, the migrant studies showed that women who migrated from developing countries to the high income countries in the USA and European countries exhibit a high risk of cervical cancer and lower participation in the screening program[44,45]. The low socioeconomic status plays as a vicious cycle here and increasing the women awareness and strengthening the public health education may cut the cycle and decrease the burden of cervical cancer in this group.

The strength of this study includes a large sample size, appropriate sampling and collection of relevant information, using a structured questionnaire. This study was conducted in the setting of opportunistic screening and showed that

even without organized screening the participation rate was considerably high in the high socioeconomic area of the city. This finding highlights the importance of education and the women's knowledge about cervical cancer prevention on their attitude and willingness to participate in screening. A field trial may elucidate the independent role of public health awareness on the control of cervical cancer prevention and mortality.

In conclusion, we found that the knowledge and practice of the women about cervical cancer prevention were weak in the capital city of Tehran. Since the incidence rate of cervical cancer is low in I.R. of Iran, an organized cervical screening program is not prioritized and women benefit from the opportunistic screening. A tailored health promotion program for public awareness and education regarding cervical cancer prevention may increase the attendance of Iranian women in cervical screening and promote the cervical cancer control status. About %10 of the Iranian population is living in Tehran and it could be seen as a cross-representative of the total Iranian population. Therefore the results from this study can be generalized to the other parts of the country and the awareness program for cervical cancer prevention could be included the national cancer control program agenda and decrease the incidence and mortality of this cancer in the country. The lesson learned from this study could be extended to other developing countries, in particular the countries with a low incidence rate and an opportunistic approach for cervical cancer prevention.

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