

# Knowledge and Attitude of Women Regarding the Human Papillomavirus (HPV) Infection, Its Relationship to Cervical Cancer and Prevention Methods

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## SUMMARY

This study aimed to determine knowledge and attitude of women to HPV and its association with cervical cancer and prevention methods. In a cross-sectional study, 500 women, aged between 20 and 50 presenting to local health centers in Tehran, were asked about demographic factors and questioned about cervical cancer, HPV, and prevention methods. Responses were tabulated and summarized. Although knowledge of HPV, its relation to cervical cancer and prevention methods among Iranian women is not enough, their attitude towards education in this regards is extremely high. The results reflect the need of advertising and educational programs for public about HPV prevention methods, to reduce the prevalence of this infection and its severe consequences.

## KEY WORDS:

Attitude; Human papillomavirus; Knowledge; Vaccinations; Women

## INTRODUCTION

Cervical cancer is a major challenge to global health and the third most common cancer among women with an estimated 529,000 new cases and 275,000 deaths in 2008. In general, approximately 88% of deaths due to cervical cancer occur in developing countries<sup>1</sup>.

Similarly, cervical cancer is in the top five cancers among Iranian women and now it has the fifth position after breast, esophagus, stomach, and colon-rectal cancer<sup>2</sup>.

Infection with human papillomavirus (HPV) is one of the most common sexually transmitted infections (STIs) plays a central role in pathogenesis of genital cancers and the most important risk factor for cervical cancer. Genital HPV types are classified into high-risk which are generally associated with cervical cancer and low risk types<sup>3</sup>. Based on studies investigating the factors associated with cancer progression in women infected by HPV, persistent high-risk HPV infection has been identified as the most important risk factor<sup>4</sup>. Therefore, these cancers could be prevented by using HPV prevention methods.

Besides vaccination against HPV, nearly all risk factors for persistent high-risk HPV and cervical cancer, including;

young age at first intercourse<sup>5</sup>; multiple sexual partner<sup>6,7</sup>; cigarette smoking<sup>8,9</sup> are preventable by awareness of the public.

The first clinical effects of a prophylactic vaccine against HPV was demonstrated by Koutsky *et al* in 2002<sup>10</sup>, and there are currently two licensed vaccines for HPV. Vaccination and immunization against HPV before sexual debut is one of the most effective strategies to control diseases linked to HPV<sup>11</sup>. Though the side effects of Vaccination against HPV is still underinvestigation, its efficacy has been proved, and the vaccine has been licensed in many developed and several developing countries<sup>12</sup>.

Although, HPV infection is common and its consequences can be severe, information about it among the majority of the population is low or nonexistent. Previous studies have shown inadequate knowledge about the HPV prevention methods among women. This is particularly true among people with lower socioeconomic status<sup>13</sup>. Attitudinal and cultural aspects of HPV infection and cervical cancer can play an important role in infection rates, prevention methods including vaccine uptake, the cost, morbidity and mortality associated with HPV-related diseases. People's perception of the risk of HPV infection and the benefits of prevention methods will lead to greater acceptance of the prevention policy. Diagnosis the knowledge gaps of population concerning HPV and attitudinal obstacle for considering prevention methods including vaccination are valuable information for health administrators and clinicians to take a stand to educate the public.

This study has been carried out to provide baseline data on the gaps in knowledge among 20-50 years Iranian women living in the city of Tehran, and also their attitudes about HPV prevention methods, particularly vaccination.

## MATERIALS AND METHODS

### Study design and population

This population based study was a descriptive, cross-sectional study on Iranian women attending health centers in urban areas of Tehran, Iran. The ethics committee of Shaheed Beheshti Medical University approved the study protocol and instruments, including consent forms. The study protocol was approved by the Institutional Review Boards of

This article was accepted: 13 October 2011

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Department of Gynecology and Obstetrics. The study was performed from March 2009 to February 2010.

Five centers (Taleghani, Shemiranat, Hengam, East, and North-East centers: university public health centers) in different areas of Tehran were randomly selected from a list of 20 urban health centers. The sample size was calculated based on a pilot study using the formula for descriptive study. When the estimated prevalence (p) = 30%, precision error of estimation (d) = 0.04, and alpha = 0.05, the sample size became 500 cases. Therefore, 100 participants were considered for each center. Data collection was continued at each site until the sample size was completed. The target population was all women attending health centers for routine annual check-up. Eligibility criteria included females, aged between 20 and 50, who could understand and complete the questionnaires. Women who refused any participation or had cervical cancer were excluded.

*Data collection*

A questionnaire was drafted for the focus group, and refined over the validation process. A pilot study on a group of 30 participants was conducted to validate the questionnaire. The first part of the questionnaire was designed to explore women's socio-demographic details and reproductive history. In the second part, a questionnaire of knowledge and attitudes towards cervical cancer and HPV prevention was conducted afterwards. The questions were formulated to explore attitudes toward the current knowledge of HPV and cervical cancer. The knowledge questions were nine facts about HPV and the participants were asked what they knew prior to receiving the questionnaire and the answers were either Yes, No, or Don't know. A score of 1 was assigned to a correct answer and a value of 0 to an incorrect answer or Don't know responses. Information was also collected attitudes about agreement to vaccination (Likert scale), education about STIs - HPV - cervical cancer (7 yes/no

questions), and their beliefs and concerns about the vaccine. All queries were adapted and modified from a previous study<sup>14</sup>. All questions were asked by trained health workers in a confidential setting.

*Statistical analyses*

The data were collected and entered into a Statistical Package for Social Sciences (SPSS software version 17.) database using a double-punch method and later matched to eliminate potential errors in data entry. Data analysis consisted of descriptive statistics including calculation of frequencies, mean scores for items related to demographic variables. Cronbach's alpha coefficient was measured to test reliability the internal consistency of the questionnaire and alpha equal to or greater than 0.70 was considered satisfactory. For instances of missing data, percentages were recalculated to include only those who responded.

**RESULTS**

*Profile of participants*

There were 500 women who met the criteria for the study and completed the questionnaire. Their characteristics are shown in Table I. About 78% of them (390 women) were between 20 and 40 years and about half of them (238 women) were housewives. Two hundred fifty-seven participants (51.4%) had one or two children and there were 165 cases (33%) with no children. The years of education was ≥ 12 (completed high school and more) in 405 (81%) women. Of the whole population, 303 (60.6%) and 364 (72.8%) were respectively born and live in Tehran (the city of the study).

*Knowledge*

The knowledge of women around HPV infection, risk factors and prevention was evaluated by asking nine questions. Table II shows the correct and incorrect response rate among participants. About half of the participants were unfamiliar

**Table I: Demographic characteristics of 500 women completing study questionnaires**

Characteristic		No.	%
<b>Age of respondent</b>	≤25	92	(18.4)
26-30	112	(22.4)	
31-35	99	(19.8)	
36-40	87	(17.4)	
41-45	48	(9.6)	
>45	62	(12.4)	
<b>No. of children</b>	0	165	(33)
1	108	(21.6)	
2	149	(29.8)	
3	51	(10.2)	
>3	27	(5.4)	
<b>Education level</b>	Read and write	34	(6.8)
Less than high school	61	(12.2)	
Completed high school	196	(39.2)	
Some college/college degree	155	(31)	
BS and more	54	(10.8)	
<b>Occupation</b>	Housewife	238	(47.6)
Nurse	68	(13.6)	
Employee	55	(11)	
Physician	39	(7.8)	
Student	27	(5.4)	
Other	32	(6.4)	
Unknown	41	(8.2)	

Table II: Responses of women to the knowledge questionnaire around HPV infection, risk factors and prevention

Knowledge	Correct Sample % (95% CI)	Incorrect Sample % (95% CI)	Do not know Sample % (95% CI)
A) HPV is a virus in the genital area that is sexually transmitted.	51 (46.5-55.5)	6.8 (4.8-9.4)	42.2 (37.8-46.7)
B) HPV is very common	34 (29.9-38.3)	14.4 (11.4-17.8)	51.6 (47.1-56.1)
C) Both men and women get infected, and pass the virus to partners.	54 (49.5-58.4)	15 (12-18.4)	31 (27-35.3)
D) The inappropriate sexual relationship can increase the probability of HPV infection.	59.2 (54.7-63.5)	8.2 (5.9-11)	32.6 (28.5-36.9)
E) Most HPV infections have no symptoms and last 6–24 months, but virus persists in some cases.	35.8 (31.6-40.2)	12.8 (10-16)	51.4 (46.9-55.9)
F) There is no treatment for HPV infection.	11.6 (8.9-14.7)	51.6 (47.1-56.1)	36.8 (32.6-41.2)
G) Other factors, like smoking and inappropriate sexual behaviors increase the risk of the virus persisting and it leads the infected cells to become cancerous.	65 (60.6-69.2)	2.8 (1.5-4.7)	32.2 (28.1-36.5)
H) In women, if the virus persists, it causes an abnormal cervical smear and cancer.	64.8 (60.4-69)	4.8 (3.1-7.1)	30.4 (26.4-34.6)
I) Prevention against HPV will prevent cervical cancer.	53.4 (48.9-57.8)	7 (4.9-9.6)	39.6 (35.3-44)

Table III: Variables describing attitudes and beliefs about the HPV vaccine

Question		Sample %	(95% CI)
Will believe the health policy makers that the vaccine is safe	Yes	24.8	(21.1-28.8)
	Probably	34.6	
	Don't know	19.8	
	Probably Not	9.4	
Will believe scientific evidence that the vaccine is safe	No	11.4	(8.7-14.5)
	Yes	27.6	
	Probably	29.2	
	Don't know	31.6	
Wants reassurance that the vaccine will protect against HPV	Probably Not	5.4	(4.3-8.7)
	No	6.2	
	Yes	25	
	Probably	22.6	
Worried by short term side effects	Probably Not	7.8	(34.5-43.2)
	No	16.4	
	Yes	28.2	
	Probably	22.6	
Worried the vaccine might have unknown long term side effects	Probably Not	7.8	(25.2-33.4)
	No	29.2	
	Yes	69	
	Probably	13.2	
The greatest concern about HPV vaccine:...	Probably Not	4.2	(5.1-9.8)
	No	7.2	
	Yes	6.4	
	Probably	4.2	
Vaccine side effects	Probably Not	4.2	(43.7-52.7)
	No	7.2	
	Yes	6.4	
	Probably	4.2	
Vaccine efficacy	Probably Not	4.2	(31.6-40.2)
	No	7.2	
	Yes	6.4	
	Probably	4.2	
Vaccine cost	Probably Not	4.2	(10.9-17.1)
	No	7.2	
	Yes	6.4	
	Probably	4.2	
Other	Probably Not	4.2	(1.1-3.9)
	No	7.2	
	Yes	6.4	
	Probably	4.2	

with HPV (Question A: 49%), its transmission ways (Question C: 46%) and prevention of cancer through the HPV vaccine (Question I: 46.6%). About two thirds of them did not know about the common involvement of HPV (Question B: 66%), and nearly the same proportion was unaware of HPV symptoms (Question E: 64.2%). About one third of them did not know about the likelihood of abnormal cervical smear in persistent infection (Question G&H: 35.1%).

#### Attitudes about HPV

The greatest concerns about HPV vaccine were side effects (48.2%), efficacy (35.8%) and cost (13.8%) of the vaccine, respectively. The concern of women about short-term and long-term side effects was 51.6% and 82.2%, respectively. About 47.6% of the study population indicated they would like a reassurance announced by health policy makers, that effective prevention against HPV infection may be obtained by vaccination. More than half of respondents believe in the

Table IV: Responses to questions concerning vaccination policy

Question	Response	Sample %	(95% CI)	
Do you agree that it is better to be vaccinated before marriage?	Strongly disagree	0.4	(0-1.4)	
	Disagree	1.8	(0.8-3.4)	
	Do not know	9.4	(7-12.3)	
	Agree	24.6	(20.9-28.6)	
	Strongly agree	63.8	(59.4-68)	
If you know that vaccination in men has stopped the virus spreading to women, which group should be vaccinated?	Both men and women	76.2	(72.2-79.9)	
	Only women	5.4	(3.6-7.8)	
	Only men	1	(0.3-2.3)	
	Multiple sexual partners	4	(2.5-6.1)	
	Women with a family history of cervical cancer	2.8	(1.5-4.7)	
	Do not know	10	(7.5-13)	
	Do you agree with universal HPV vaccination in all before marriage?	Strongly disagree	1.4	(0.6-2.9)
		Disagree	7.6	(5.4-10.3)
Do not know		12.6	(9.8-15.8)	
Agree		32	(27.9-36.3)	
Strongly agree		46.4	(42-50.9)	
At what age should HPV vaccination start?	12-14	19.8	(16.4-23.6)	
	14-16	19.8	(16.4-23.6)	
	16-18	22.8	(19.2-26.7)	
	More than 18	33	(28.9-37.3)	
	Never	1.4	(0.6-2.9)	
Who should make the decision on HPV vaccination?	Person him/herself	41.6	(37.2-46.1)	
	Joint decision of parents and young person	30.8	(26.8-35.1)	
	Only the parents	13.6	(10.7-16.9)	
	Mother	1	(0.3-2.3)	
	Father	1.2	(0.4-2.6)	
Do you agree that a well informed person should be able to request vaccination before marriage without parental consent?	Strongly disagree	8.2	(5.9-11)	
	Disagree	15.4	(12.3-18.9)	
	Do not know	11.4	(8.7-14.5)	
	Agree	37.2	(33-41.6)	
	Strongly agree	27.8	(23.9-32)	
Do people need information about HPV at all?	Yes	95.2	(92.9-96.9)	
Do people need information about HPV before marriage?	Yes	92.8	(90.2-94.9)	
If given in adolescents, what should it be? . . .				
Information on cervical cancer and its prevention	Yes	42.8	(38.4-47.3)	
Biological information on HPV and other STIs.	Yes	22.4	(18.8-26.3)	
Information on STIs treatment	Yes	14.4	(11.4-17.8)	
Information on STIs prevention	Yes	10.2	(7.7-13.2)	
Do you agree with education about prevention methods including vaccination as part of a reproductive health education program?	Strongly disagree	0.6	(0.1-1.7)	
	Disagree	5.2	(3.4-7.5)	
	Do not know	6	(4.1-8.5)	
	Agree	39.4	(35.1-43.8)	
	Strongly agree	48.8	(44.3-53.3)	
If vaccination is recommended, do you agree to receive it before marriage?	Strongly disagree	1.4	(0.6-2.9)	
	Disagree	1.4	(0.6-2.9)	
	Do not know	6.8	(4.8-9.4)	
	Agree	21.4	(17.9-25.3)	
	Strongly agree	69	(64.7-73)	

safety of the vaccine against HPV (59.4%) and relies on the scientific evidence for this (56.8%). (Table III)

Four hundred forty-two (88.4%) participants agreed with the administration of HPV vaccine before marriage. Participants were informed about the results of previous researches indicated that vaccination of men has stopped the spread of the virus to women. Thus, 381 (76.2%) cases thought that all should be vaccinated against HPV. Some participants thought only women (5.4%) and 14 (2.8%) cases said that women with a family history of cervical cancer should be vaccinated

against HPV. Vaccination only in people with inappropriate sexual relationship was the view of 20 (4%) participants. Ten percent of the study population stated they did not know about this issue. Over 78% of surveyed women favored universal HPV vaccination for all and approximately 9% disagreed. They thought suitable age for vaccination was 12-14, 14-16, 16-18, and over 18 years in 99 (20.5%), 99 (20.5%), 114 (23.6%), and 165 (34%) participants, respectively. The answer to the question "who should make the decision on vaccination" was the "person him/herself", "joint decision of young person and parents", and "only parental decision

making" in 208 (47.2%), 154 (34.9%), and 68 (15.4%) participants, respectively. About 65% of them agreed with the HPV vaccination before marriage without parental consent if the person was informed about HPV. In fact, most of participants (95.2%) agreed that their family be informed about HPV and a similar proportion (92.8%) stated the time before marriage were an appropriate period for the education of this issue. However, the education about "cervical cancer and its prevention methods", "HPV and other STIs," "prevention of STIs", "STI treatment" was approved in only 214 (42.8%), 112 (22.4%), 51 (10.2%), and 72 (14.4%), respectively. More than 88% agreed with the education about HPV prevention as part of a program of reproductive health education and 90.4% of them accepted to receive the HPV vaccine if recommended. (Table IV)

## DISCUSSION

The most notable results are that:

- About 50% of surveyed women did not know that HPV is an infection in men and women which might be sexually transmitted;
- About 40% had no knowledge about HPV relation to cervical cancer;
- Over 60% were unaware that the HPV prevention methods including vaccination can prevent cervical cancer;
- Over 90% were in agreement with educating their children before marriage about all prevention methods including HPV vaccination

Overall, these findings indicate knowledge of women is low to moderate which is similar to other studies<sup>12,15-17</sup>. It is also showed that the rejection of prevention methods against HPV is linked to lack of awareness, negative attitudes and misconceptions about cervical cancer and HPV prevention methods, particularly concern regarding side effects of vaccination<sup>15</sup>. Not only in developing countries HPV awareness were reported low, but in some developed countries such as UK and US, despite the universal screening program for cervical cancer with the smear test<sup>14,18-21</sup>. Women often acquired the information from multiple sources, including the media, friends, and physician and naturally these could not form an appropriate attitude regarding HPV prevention methods.

Regarding HPV vaccination, the belief in the authorities was good enough in our study group and 60% of women said they would trust the national health system reassurances safety of the vaccines and about the same proportion had believed in the scientific evidence on the safety and efficacy of the vaccine. This is consistent with findings from another study in the UK, China and Malaysia<sup>12,14,22</sup>. In the Chinese study, a population based survey was conducted on 8188 Chinese women aged 14–59 years between 2005 and 2007. The doubt on the safety of the vaccine was the main reason for unwilling mothers about the HPV vaccination in their daughters in 64% of this Chinese population<sup>12</sup>. In 2005, a survey was carried out among parents of young adolescents in UK. This study indicated concern about safety of vaccine was seen in 60-70% of their participants these parents were least likely to support the vaccination policy<sup>14</sup>. A survey in

Malaysia in 2007, evaluated the knowledge and attitude of 650 female students. A total of 50.9% in this study were concerned about the safety and efficacy of HPV vaccine and this formed the main reason for the vaccine refusal among them<sup>22</sup>. Another study from Asia reported knowledge about HPV was a predictor of HPV prevention acceptability<sup>15</sup>. Similar to other studies<sup>23,24</sup>, the most important issue regarding the acceptance of HPV vaccination was its side effects in present study; 80% were concerned of its long-term side effects and 50% of short term side effects. The second important concern was vaccine efficacy among the study population (about 36%). Furthermore, cost of the vaccine was an uncommon concern among women.

Almost 70% of our population agreed with the universal HPV vaccination and near 90% of them approved the HPV vaccination before marriage. It seems education and publicizing about HPV and implementation of a prevention program against HPV will increase the satisfaction and confidence of the target group. This could be achieved with the development of health promotion and educational strategies for the public.

About three quarters of women believed that all people should be vaccinated (76%) and that the age before 18 is better (65%). Half of the participants thought that the individual could make his/her own decision regarding vaccination. Although, this study included only women, men in Iran are also likely to play a role in determining whether their children should be vaccinated against HPV. A study in Singapore indicated that men have little knowledge and awareness of HPV and should be included in educational programs of reducing the rate of cervical cancer<sup>25</sup>.

Although, the majority of our cases believed that their children need education about HPV before marriage (92%) preferably as a part of reproductive health education program (85%), education about cervical cancer, treatment and prevention of STIs was not much desired.

## CONCLUSION

The results of our study were similar to recent systemic review on knowledge and attitudes regarding the prevention of cervical cancer and HPV vaccination<sup>26</sup>. Even though the Iranian women's information about HPV is low to moderate, but their attitude indicated they agree with education and prevention program. These results indicate the need and importance of giving adequate information and educational programs organized by health policy makers to the general public to ensure agreement with prevention methods.

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