

Public Awareness and Acceptance of HPV Infection and HPV Vaccination in Tehran, Iran: A Cross-Sectional Community Survey

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ABSTRACT

Background: Human papillomavirus (HPV) is the most common sexually transmitted infection globally and the primary cause of cervical cancer. Public awareness and acceptance of HPV vaccination are essential for effective prevention.

Objective: This study aimed to assess knowledge, attitudes, and acceptance of HPV infection and HPV vaccination among adults in Tehran, Iran.

Methods: A community-based cross-sectional study was conducted between March and June 2026 among 120 adults residing in Tehran. Participants were selected using convenience sampling from public areas and healthcare centers. Data were collected using a structured questionnaire assessing demographic characteristics, knowledge about HPV infection, attitudes toward HPV vaccination, and willingness to receive the vaccine. Data were analyzed using SPSS version 26. Descriptive statistics, chi-square tests, independent t-tests, and logistic regression were used. A p-value <0.05 was considered statistically significant.

Results: A total of 120 participants completed the survey (62 females, 58 males). The mean age was 31.8 ± 8.7 years. Overall, 43.3% of participants demonstrated good knowledge of HPV infection. Only 38.3% were aware that HPV is associated with cervical cancer. Awareness of HPV vaccination was reported by 41.7% of participants. Approximately 52.5% expressed willingness to receive the HPV vaccine. Higher education level (OR=2.6, $p=0.01$) and prior awareness of HPV (OR=3.4, $p<0.001$) were significant predictors of vaccine acceptance.

Conclusion: Knowledge of HPV infection and vaccination among adults in Tehran was moderate, with significant gaps in awareness regarding cervical cancer prevention. Educational campaigns and public health interventions are needed to improve HPV literacy and increase vaccine acceptance.

Keywords

Human papillomavirus (HPV), Cervical cancer, Public awareness, Acceptance, HPV vaccination, Tehran.

Introduction

Human papillomavirus (HPV) is one of the most common sexually transmitted infections worldwide [1]. More than 200 HPV genotypes have been identified, of which approximately 14

are considered high-risk types associated with cancer development [2]. Persistent infection with high-risk HPV types, particularly HPV-16 and HPV-18, is responsible for approximately 70% of cervical cancer cases globally [1].

Cervical cancer remains a major public health problem, particularly in low- and middle-income countries where screening and vaccination programs are limited [3]. According to the World

Health Organization, nearly 600,000 new cases of cervical cancer and more than 340,000 deaths occur each year worldwide [4].

HPV vaccination is one of the most effective preventive strategies for reducing HPV-related cancers [5]. The World Health Organization recommends routine HPV vaccination for adolescents, particularly girls aged 9–14 years [6]. Several countries have implemented national vaccination programs, resulting in substantial reductions in HPV infections and precancerous cervical lesions [7].

Despite the availability of safe and effective vaccines, public awareness and acceptance remain critical determinants of vaccine uptake. Cultural beliefs, lack of knowledge about HPV transmission, and concerns about vaccine safety may influence attitudes toward vaccination [8].

In Iran, HPV vaccination is not yet included in the national immunization program, and public awareness remains relatively limited [9]. Few studies have investigated knowledge and attitudes toward HPV infection and vaccination among the general population in Tehran [10–12].

Therefore, this study aimed to assess knowledge, attitudes, and acceptance of HPV infection and HPV vaccination among adults in Tehran, Iran.

Methods

Study Design

This study employed a community-based cross-sectional design to assess public awareness and acceptance of HPV infection and HPV vaccination in Tehran.

Study Setting

Tehran, the capital city of Iran.

Study Period

Data were collected between March and June 2026.

Study Population

The study population consisted of adults aged 18 years and older residing in Tehran.

Study Population and Eligibility Criteria

The study population consisted of adults aged 18 years and older residing in Tehran. Individuals were eligible to participate if they were aged ≥ 18 years, lived in Tehran, were able to read and understand Persian, and were willing to participate in the study by providing informed consent. Individuals who were healthcare professionals specializing in infectious diseases or gynecology were excluded to minimize potential bias due to professional knowledge. Participants who declined to provide consent or submitted questionnaires with more than 20% missing responses were also excluded from the analysis.

Sample Size Determination

The required sample size was calculated using the standard formula for estimating a proportion in cross-sectional studies:

$$n = Z^2 p(1-p) / d^2$$

where Z represents the standard normal value corresponding to a 95% confidence level (1.96), p represents the estimated proportion of awareness in the population (0.5, chosen to maximize sample size due to lack of prior local estimates), and d represents the margin of error (0.09). Based on this calculation, the minimum sample size was estimated to be approximately 118 participants. To account for potential incomplete responses, a final target sample size of 120 participants was considered.

$p = 0.5$ (expected awareness)

$Z = 1.96$

$d = 0.09$

Estimated sample size ≈ 118 participants.

To account for incomplete responses, the final target sample was 120 participants.

Sampling Method and Data Collection

Convenience sampling was used to recruit participants from various public locations in Tehran, including public parks, shopping centers, university campuses, and primary healthcare centers. Individuals who met the inclusion criteria were approached and informed about the purpose of the study. After obtaining informed consent, participants were asked to complete a structured self-administered questionnaire. Participation was voluntary and anonymous.

A total of 128 individuals were approached to participate in the study. Of these, 120 individuals completed the questionnaire and were included in the final analysis. Eight questionnaires were excluded due to incomplete responses.

Data Collection Tool

A structured self-administered questionnaire consisting of 4 sections.

Section 1: Demographic Characteristics

Variables included:

- age
- gender
- marital status
- education level
- occupation
- monthly income

Age groups:

- 18–24
- 25–34
- 35–44
- ≥ 45

Education levels:

- High school or less
- Diploma
- Bachelor's degree
- Master's or higher

Section 2: Knowledge of HPV Infection

12 questions (True/False/Don't know)

Questions included:

HPV is a sexually transmitted infection.

HPV infection can cause cervical cancer.

HPV can affect both men and women.

HPV infection may occur without symptoms.

Some HPV infections clear spontaneously without treatment.

HPV can cause genital warts.

Persistent HPV infection increases cancer risk.

Condom use can reduce but not fully eliminate HPV transmission risk.

HPV infection is always symptomatic.

HPV infection only affects women.

HPV can be prevented by vaccination.

HPV vaccination is useful only after HPV infection occurs.

Scoring:

Correct answer = 1

Incorrect/Don't know = 0

Total score range: 0–12

Knowledge level:

Poor: 0–4

Moderate: 5–8

Good: 9–12

Section 3: Attitudes Toward HPV Vaccination

8 items using 5-point Likert scale

Strongly disagree (1) → Strongly agree (5)

Examples:

HPV vaccination is important for preventing cervical cancer.

HPV vaccination should be recommended to adolescents.

HPV vaccine is safe.

HPV vaccine should be available in public health centers.

Parents should receive education about HPV vaccination.

Healthcare providers should discuss HPV vaccination with patients.

HPV vaccination is also important for males.

.Public campaigns can improve HPV vaccine acceptance.

Score range:

8–40

Higher scores indicate more positive attitudes.

Section 4: Vaccine Acceptance

Questions included:

.Willing to receive HPV vaccine

.Willing to recommend HPV vaccine to others

.Willing to vaccinate future children

.Would receive vaccine if recommended by physician

.Would receive vaccine if free/subsidized

.Would receive vaccine despite cultural sensitivity

Validity and Reliability of the Questionnaire

Content validity of the questionnaire was assessed by a panel of experts including two public health specialists and two infectious

disease specialists who reviewed the items for relevance, clarity, and comprehensiveness. A pilot study was conducted on 20 participants who were not included in the final study sample in order to evaluate the clarity and reliability of the questionnaire.

Internal consistency reliability was assessed using appropriate coefficients. The knowledge scale demonstrated acceptable reliability with a Kuder–Richardson coefficient (KR-20) of 0.79, and the attitude scale showed good internal consistency with a Cronbach's alpha of 0.83.

Statistical Analysis

Statistical analysis was performed using appropriate statistical software. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize demographic characteristics and study variables. The chi-square test was applied to examine associations between categorical variables. Independent t-tests were used to compare mean knowledge and attitude scores between two groups, and one-way analysis of variance (ANOVA) was employed for comparisons across more than two groups. Pearson correlation analysis was conducted to evaluate the relationships between knowledge, attitude, and vaccine acceptance scores. Multivariable logistic regression analysis was performed to identify independent predictors of willingness to receive the HPV vaccine. Adjusted odds ratios (aORs) with 95% confidence intervals (CIs) were calculated. A p-value of less than 0.05 was considered statistically significant.

Results

A total of 128 individuals were approached, of whom 120 completed the questionnaire and were included in the final analysis, yielding a response rate of 93.8%. The mean age of participants was 31.8 ± 8.7 years. Of the participants, 62, 51.7%, were female and 58, 48.3%, were male. The largest age group was 25–34 years, comprising 46 participants, 38.3%. Most participants had a university-level education, with 49, 40.8%, holding a bachelor's degree and 18, 15.0%, holding a master's degree or higher.

The mean knowledge score regarding HPV infection was 6.9 ± 2.8 out of 12. Overall, 32 participants, 26.7%, had good knowledge, 58, 48.3%, had moderate knowledge, and 30, 25.0%, had poor knowledge. Regarding specific knowledge items, 66 participants, 55.0%, correctly identified HPV as a sexually transmitted infection, while only 46, 38.3%, knew that HPV infection can cause cervical cancer. Furthermore, 55 participants, 45.8%, knew that HPV can affect both men and women, and 49, 40.8%, were aware that HPV infection may be asymptomatic.

Overall, 61 participants, 50.8%, had previously heard of HPV infection, while 50, 41.7%, had heard of HPV vaccination. Only 34 participants, 28.3%, were aware that HPV vaccination can prevent cervical cancer. The most common source of HPV-related information was the internet and social media, reported by 45 participants, 37.5%, followed by healthcare providers, reported by 29 participants, 24.2%.

The mean attitude score toward HPV vaccination was 29.4 ± 5.7 out of 40. Overall, 69 participants, 57.5%, had a positive attitude toward HPV vaccination, while 33, 27.5%, had a neutral attitude and 18, 15.0%, had a negative attitude. Most participants agreed that healthcare providers should discuss HPV vaccination with patients, 75.8%, and that parents should receive education about HPV vaccination, 73.3%.

Regarding vaccine acceptance, 63 participants, 52.5%, reported willingness to receive the HPV vaccine if available, and 71, 59.2%, were willing to recommend the vaccine to others. Acceptance increased to 74.2% if the vaccine was offered free or subsidized and to 68.3% if recommended by a physician. The most frequently reported barriers to vaccination were concerns about vaccine safety, 31.7%, high cost, 28.3%, and lack of sufficient information, 25.8%.

Good HPV knowledge was significantly associated with higher educational level, $p=0.01$, health-related education or occupation, $p<0.001$, and prior awareness of HPV, $p<0.001$. Vaccine acceptance was significantly higher among female participants, $p=0.04$, participants with higher education, $p=0.02$, those with prior awareness of HPV, $p<0.001$, those with positive attitudes toward vaccination, $p<0.001$, and those who reported physician recommendation, $p=0.002$.

Female participants had slightly higher mean knowledge scores than male participants, 7.3 ± 2.7 versus 6.4 ± 2.9 , although this difference was not statistically significant, $p=0.08$. However, female participants had significantly higher attitude scores compared with male participants, 30.6 ± 5.2 versus 28.1 ± 6.0 , $p=0.02$. Knowledge and attitude scores increased significantly with higher educational level.

Correlation analysis showed a significant positive correlation between knowledge score and attitude score, $r=0.46$, $p<0.001$. Knowledge score was also positively correlated with vaccine acceptance, $r=0.34$, $p<0.001$, and attitude score showed the strongest correlation with vaccine acceptance, $r=0.52$, $p<0.001$.

In multivariable logistic regression analysis, bachelor's degree or higher remained significantly associated with HPV vaccine acceptance, adjusted OR=2.64, 95% CI: 1.18–5.91, $p=0.018$. Prior awareness of HPV was also an independent predictor of vaccine acceptance, adjusted OR=3.42, 95% CI: 1.54–7.61, $p=0.003$. Positive attitude toward HPV vaccination showed the strongest association with acceptance, adjusted OR=4.18, 95% CI: 1.84–9.51, $p=0.001$. Physician recommendation was also significantly associated with acceptance, adjusted OR=2.71, 95% CI: 1.16–6.35, $p=0.021$.

Study Population

A total of 128 individuals were approached. Eight questionnaires were excluded because of incomplete responses, leaving 120 participants for final analysis. The response rate was 93.8%.

The mean age of participants was 31.8 ± 8.7 years, ranging from 18 to 54 years. Of the 120 participants, 62 were female, representing 51.7% of the sample.

Table 1: Sociodemographic Characteristics of Participants.

Variable	Category	Frequency n	Percentage %
Gender	Female	62	51.7
	Male	58	48.3
Age group, years	18–24	34	28.3
	25–34	46	38.3
	35–44	27	22.5
	≥45	13	10.8
Marital status	Single	58	48.3
	Married	57	47.5
	Divorced/Widowed	5	4.2
Educational level	High school or less	22	18.3
	Diploma	31	25.8
	Bachelor's degree	49	40.8
	Master's degree or higher	18	15.0
Occupation	Student	36	30.0
	Employed	54	45.0
	Unemployed/ Housewife	18	15.0
	Self-employed/Other	12	10.0
Monthly household income	Low	29	24.2
	Moderate	67	55.8
	High	24	20.0
Health-related education/job	Yes	21	17.5
	No	99	82.5

Knowledge about HPV Infection

The mean knowledge score was 6.9 ± 2.8 out of 12. Overall, 32 participants, 26.7%, had good knowledge, 58 participants, 48.3%, had moderate knowledge, and 30 participants, 25.0%, had poor knowledge.

Table 2: Knowledge Level of Participants Regarding HPV Infection.

Knowledge level	Score range	Frequency n	Percentage %
Poor knowledge	0–4	30	25.0
Moderate knowledge	5–8	58	48.3
Good knowledge	9–12	32	26.7
Total	—	120	100.0

Mean knowledge score: $6.9 \pm 2.8 / 12$

Awareness of HPV and HPV Vaccination

Overall, 61 participants, 50.8%, had previously heard of HPV infection, while 50 participants, 41.7%, had heard of HPV vaccination. Only 34 participants, 28.3%, knew that HPV vaccination can help prevent cervical cancer.

Sources of Information

The most common source of information was the internet/social media, reported by 45 participants, 37.5%, followed by healthcare providers, reported by 29 participants, 24.2%.

Table 3: Correct Responses to HPV Knowledge Items.

No.	Knowledge item	Correct response	Correct n	Correct %
1	HPV is a sexually transmitted infection.	True	66	55.0
2	HPV infection can cause cervical cancer.	True	46	38.3
3	HPV can affect both men and women.	True	55	45.8
4	HPV infection may occur without symptoms.	True	49	40.8
5	Some HPV infections clear spontaneously without treatment.	True	43	35.8
6	HPV can cause genital warts.	True	52	43.3
7	Persistent HPV infection increases cancer risk.	True	44	36.7
8	Condom use can reduce but not fully eliminate HPV transmission risk.	True	38	31.7
9	HPV infection is always symptomatic.	False	47	39.2
10	HPV infection only affects women.	False	58	48.3
11	HPV can be prevented by vaccination.	True	50	41.7
12	HPV vaccination is useful only after HPV infection occurs.	False	42	35.0

Table 4: Awareness of HPV Infection and HPV Vaccination.

Awareness variable	Yes n	Yes %	No n	No %
Had previously heard of HPV infection	61	50.8	59	49.2
Had previously heard of HPV vaccination	50	41.7	70	58.3
Knew HPV is related to cervical cancer	46	38.3	74	61.7
Knew HPV vaccine can prevent cervical cancer	34	28.3	86	71.7
Had received information from a healthcare provider	29	24.2	91	75.8
Had searched information online/social media	45	37.5	75	62.5
Knew HPV vaccine is recommended before sexual debut	31	25.8	89	74.2
Knew HPV vaccine can be useful for males	37	30.8	83	69.2

Table 5: Sources of HPV-Related Information.

Source of information	Frequency n	Percentage %
Internet/social media	45	37.5
Healthcare providers	29	24.2
Friends/family	25	20.8
Television/radio	18	15.0
University/school education	23	19.2
Scientific websites/articles	14	11.7
No prior source of information	39	32.5

Participants could select more than one source; therefore, percentages do not sum to 100%.

Attitudes toward HPV Vaccination

The mean attitude score was 29.4 ± 5.7 out of 40. Overall, 69 participants, 57.5%, had a positive attitude toward HPV vaccination.

Table 6: Attitude toward HPV Vaccination.

Attitude category	Score range	Frequency n	Percentage %
Negative attitude	8–20	18	15.0
Neutral attitude	21–28	33	27.5
Positive attitude	29–40	69	57.5
Total	—	120	100.0

Mean attitude score: $29.4 \pm 5.7 / 40$.

Table 7: Responses to Attitude Items toward HPV Vaccination.

No.	Attitude item	Agree/Strongly agree n	Agree/Strongly agree %
1	HPV vaccination is important for preventing cervical cancer.	76	63.3
2	HPV vaccination should be recommended to adolescents.	70	58.3
3	HPV vaccine is safe.	57	47.5
4	HPV vaccine should be available in public health centers.	82	68.3
5	Parents should receive education about HPV vaccination.	88	73.3
6	Healthcare providers should discuss HPV vaccination with patients.	91	75.8
7	HPV vaccination is also important for males.	54	45.0
8	Public campaigns can improve HPV vaccine acceptance.	84	70.0

HPV Vaccine Acceptance

Overall, 63 participants, 52.5%, stated that they would be willing to receive the HPV vaccine if available and affordable. Moreover, 71 participants, 59.2%, were willing to recommend HPV vaccination to others.

Table 8: HPV Vaccine Acceptance and Willingness.

Vaccine acceptance variable	Yes n	Yes %	No/Unsure n	No/Unsure %
Willing to receive HPV vaccine	63	52.5	57	47.5
Willing to recommend HPV vaccine to others	71	59.2	49	40.8
Willing to vaccinate future children	68	56.7	52	43.3
Would receive vaccine if recommended by physician	82	68.3	38	31.7
Would receive vaccine if free/subsidized	89	74.2	31	25.8
Would receive vaccine despite cultural sensitivity	54	45.0	66	55.0

Barriers to HPV Vaccination

The most frequently reported barriers were concerns about vaccine

safety, high cost, and lack of adequate information.

Table 9: Reported Barriers to HPV Vaccination.

Barrier	Frequency n	Percentage %
Concern about vaccine safety	38	31.7
High cost of vaccine	34	28.3
Lack of sufficient information	31	25.8
Fear of side effects	29	24.2
Cultural or social sensitivity	17	14.2
Uncertainty about vaccine effectiveness	21	17.5
Lack of physician recommendation	26	21.7
Difficulty accessing vaccine	19	15.8
Belief that HPV vaccine is unnecessary	13	10.8

Participants could select more than one barrier.

Association between Sociodemographic Factors and Good Knowledge

Good knowledge was significantly more common among participants with higher educational level, health-related education/ job, and prior awareness of HPV.

Comparison of Mean Knowledge and Attitude Scores by Gender

Female participants had slightly higher mean knowledge and attitude scores than male participants. The difference in attitude score was statistically significant.

Table 11: Association between Participant Characteristics and HPV Vaccine Acceptance.

Variable	Category	Accepted vaccine n/N	Acceptance %	p-value
Gender	Female	38/62	61.3	0.04
	Male	25/58	43.1	
Age group	18–24	18/34	52.9	0.88
	25–34	25/46	54.3	
	35–44	14/27	51.9	
	≥45	6/13	46.2	
Educational level	High school or less	8/22	36.4	0.02
	Diploma	13/31	41.9	
	Bachelor’s degree	31/49	63.3	
	Master’s or higher	11/18	61.1	
Health-related education/job	Yes	15/21	71.4	0.04
	No	48/99	48.5	
Prior awareness of HPV	Yes	42/61	68.9	<0.001
	No	21/59	35.6	
Positive attitude	Yes	50/69	72.5	<0.001
	No/Neutral	13/51	25.5	
Physician recommendation	Yes	52/82	63.4	0.002
	No/Unsure	11/38	28.9	

Table 10: Association between Demographic Variables and Good HPV Knowledge.

Variable	Category	Good knowledge n/N	Good knowledge %	p-value
Gender	Female	20/62	32.3	0.14
	Male	12/58	20.7	
Age group	18–24	8/34	23.5	0.47
	25–34	15/46	32.6	
	35–44	7/27	25.9	
	≥45	2/13	15.4	
Educational level	High school or less	2/22	9.1	0.01
	Diploma	6/31	19.4	
	Bachelor’s degree	17/49	34.7	
	Master’s or higher	7/18	38.9	
Health-related education/job	Yes	12/21	57.1	<0.001
	No	20/99	20.2	
Prior awareness of HPV	Yes	25/61	41.0	<0.001
	No	7/59	11.9	
Marital status	Single	17/58	29.3	0.61
	Married	14/57	24.6	
	Divorced/Widowed	1/5	20.0	

Table 12: Mean Knowledge and Attitude Scores by Gender.

Score	Female Mean ± SD	Male Mean ± SD	p-value
Knowledge score, 0–12	7.3 ± 2.7	6.4 ± 2.9	0.08
Attitude score, 8–40	30.6 ± 5.2	28.1 ± 6.0	0.02

Comparison of Mean Scores by Educational Level

Participants with higher education had significantly higher knowledge and attitude scores.

Table 13: Mean Knowledge and Attitude Scores by Educational Level.

Educational level	Knowledge score Mean ± SD	Attitude score Mean ± SD
High school or less	5.1 ± 2.4	25.8 ± 5.9
Diploma	6.2 ± 2.5	28.0 ± 5.6
Bachelor’s degree	7.5 ± 2.6	30.6 ± 5.1
Master’s or higher	8.1 ± 2.8	31.7 ± 4.9
p-value	0.003	0.004

Correlation between Knowledge, Attitude, and Vaccine Acceptance

Knowledge score was positively correlated with attitude score. Participants with higher knowledge had more positive attitudes toward HPV vaccination. Attitude score was also positively associated with vaccine acceptance.

Table 14: Correlation between Knowledge, Attitude, and Vaccine Acceptance.

Variables	Correlation coefficient r	p-value
Knowledge score and attitude score	0.46	<0.001
Knowledge score and vaccine acceptance	0.34	<0.001
Attitude score and vaccine acceptance	0.52	<0.001

Multivariable Logistic Regression Analysis

In multivariable logistic regression, prior awareness of HPV, positive attitude toward HPV vaccination, and higher educational level remained significant independent predictors of HPV vaccine acceptance.

Table 15: Multivariable Logistic Regression Predicting HPV Vaccine Acceptance

Outcome variable: Willingness to receive HPV vaccine: Yes vs No/Unsure

Predictor	Adjusted OR	95% CI	p-value
Female gender	1.78	0.82–3.86	0.14
Age ≥35 years	0.91	0.39–2.12	0.82
Bachelor’s degree or higher	2.64	1.18–5.91	0.018
Health-related education/job	1.96	0.72–5.33	0.18
Prior awareness of HPV	3.42	1.54–7.61	0.003
Good HPV knowledge	1.89	0.78–4.56	0.15
Positive attitude toward HPV vaccination	4.18	1.84–9.51	0.001
Physician recommendation	2.71	1.16–6.35	0.021

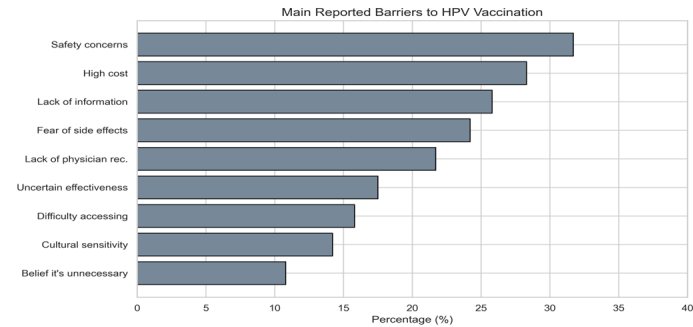


Figure 1: Reported barriers to HPV vaccination among study participants (n=120).

As illustrated in Figure 1, the primary obstacles identified by participants regarding HPV vaccine uptake were concerns regarding vaccine safety (31.7%) and the high cost of the vaccine (28.3%). Lack of sufficient information (25.8%) and fear of potential side effects (24.2%) were also frequently cited. These findings suggest that addressing misconceptions about vaccine safety and improving vaccine accessibility through government-

subsidized programs are critical steps to increasing vaccine acceptance in the study population.

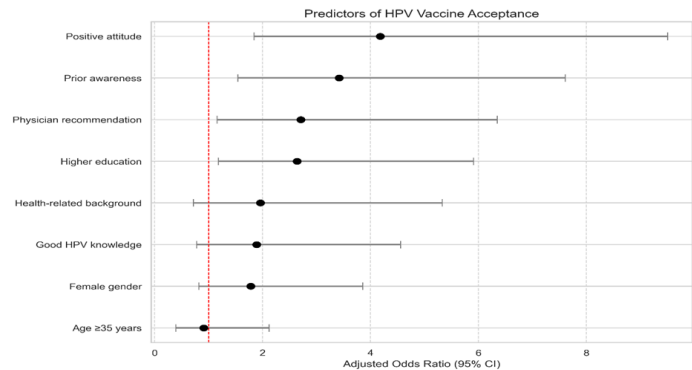


Figure 2: Significant independent predictors of HPV vaccine acceptance among adults in Tehran (results based on multivariable logistic regression).

Figure 2 summarizes the significant independent predictors associated with a willingness to receive the HPV vaccine. Multivariable logistic regression analysis demonstrated that a positive attitude toward vaccination (AOR=4.18, 95% CI: 1.84–9.51) and prior awareness of HPV (AOR=3.42, 95% CI: 1.54–7.61) were the strongest predictors of acceptance. Furthermore, receiving a physician’s recommendation (AOR=2.71) and attaining a higher education level (AOR=2.64) were significantly associated with an increased likelihood of vaccine acceptance. These results underscore the pivotal role of health literacy and healthcare professional counseling in improving HPV vaccination coverage.

Discussion

The present study evaluated knowledge, attitudes, and acceptance of HPV infection and HPV vaccination among adults in Tehran. Overall, knowledge levels were moderate, and awareness of HPV vaccination was limited.

Only about one-quarter of participants demonstrated good knowledge of HPV infection. Similar findings have been reported in several international studies, where public knowledge about HPV remains limited despite increasing awareness of cervical cancer prevention.

A particularly important finding of this study was the limited awareness of the relationship between HPV infection and cervical cancer. Less than 40% of participants correctly identified HPV as a cause of cervical cancer. Similar knowledge gaps have been reported in community-based studies in several countries [13-15].

Approximately half of participants expressed willingness to receive the HPV vaccine. This level of vaccine acceptance is comparable to findings from other Middle Eastern populations where vaccine uptake remains moderate [16-18].

Education level was a significant predictor of knowledge and vaccine acceptance. Participants with university-level education

were more likely to have accurate knowledge about HPV and to express willingness to receive vaccination. This association has been widely reported in studies examining vaccine literacy and preventive health behaviors [19-21].

Prior awareness of HPV was another strong predictor of vaccine acceptance. Participants who had previously heard about HPV infection were significantly more likely to support vaccination. This finding highlights the importance of public health education campaigns in improving vaccine uptake.

Cost and safety concerns were the most frequently reported barriers to vaccination. Similar concerns have been documented in several international studies evaluating HPV vaccine hesitancy [22-24].

Overall, the findings suggest that public awareness campaigns, healthcare provider education, and improved access to vaccination may play an important role in increasing HPV vaccine acceptance in Tehran.

Conclusion

Knowledge of HPV infection and HPV vaccination among adults in Tehran was moderate, with substantial gaps in awareness of cervical cancer prevention. Educational level and prior awareness were significant predictors of vaccine acceptance. Public health strategies focusing on community education and improved access to HPV vaccination may help increase vaccine uptake and reduce HPV-related disease burden.

Ethics Approval

Ethical approval for this study was obtained from the Ethics Committee of Shahid Beheshti University, Tehran, Iran. All participants were informed about the objectives and procedures of the study before participation. Written informed consent was obtained from all participants prior to data collection. Participation in the study was entirely voluntary. All collected data were kept confidential and used solely for research purposes.

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