J Surg Med. 2025;9(1):1-5.
https://doi.org/10.28982/josam.7811

JOSAM

Research article
https://jsurgmed.com/

Journal of Surgery and Medicine

e-ISSN: 2602-2079

Evaluation of patient awareness of 4v and 9v HPV vaccines: A Turkish survey

Tugba Akcaoglu [1,2], Elif Ucar [3], Ozan Dogan [4]

[1] Department of Plastic & Reconstructive Surgery, Johns Hopkins University, School of Medicine, Baltimore, Maryland, The United States of America
[2] Department of Obstetrics & Gynecology, Istanbul Medipol University, School of Medicine, Istanbul, Turkey
[3] Private Esencan Hospital, Istanbul, Turkey
[4] Department of Obstetrics & Gynecology, Istanbul Nisantasi University, School of Medicine, Istanbul, Turkey

ORCID of the author(s)

TA: https://orcid.org/0000-0002-0354-3292
EU: https://orcid.org/0000-0001-5302-4688
OD: https://orcid.org/0000-0002-0016-8749

Corresponding Author
Tugba Akcaoglu
Department of Plastic & Reconstructive Surgery, Johns Hopkins University, School of Medicine, Baltimore, MD, USA
E-mail: takcaog1@jh.edu

Ethics Committee Approval
The study was approved by the Istanbul Medipol University Ethical Committee (number 361) on April 13th, 2023.
All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

Conflict of Interest
No conflict of interest was declared by the authors.

Financial Disclosure
The authors declared that this study has received no financial support.

Previous Presentation
The abstract of this study was accepted as a poster presentation by the Scientific Programme Committee for the XXIV FIGO World Congress of Gynecology and Obstetrics. The poster was presented by the corresponding author at the congress, which was held at Paris Convention Centre in Paris, France on October 9th–12th, 2023. The abstract was published in the International Journal of Gynecology & Obstetrics, Volume 163, Issue S1 on October 8th, 2023. (https://doi.org/10.1002/ijgo.15055)

Published
2024 December 26

Abstract

Background/Aim: The 9-valent (9v) Human Papillomavirus (HPV) vaccine was implemented in Turkey in December 2022 and has just started to be applied. The vaccine is intended to protect against diseases caused by Human Papillomavirus (HPV) Types 6, 11, 16, 18, 31, 33, 45, 52, and 58. Awareness of vaccines in Turkey can be improved through physicians' and health workers' efforts, social media and other communication channels.
Methods: To guide awareness-raising efforts pertaining to vaccines, we asked our patients who applied for the HPV vaccine at the beginning of 2023 to answer a questionnaire. The survey was prepared to reflect vaccine-related awareness levels of patients applying for the 4v and 9v HPV vaccines.
Results: It is noteworthy that the monthly income of patients applying for the vaccine was below the national average. Doubts about the effectiveness of the vaccine and levels of anxiety about its side effects are still high. Less than half of individuals who applied for vaccination received gynecological exams and regular Pap smears. Patients were largely unaware that there were different vaccines against HPV, that the 9v HPV vaccine provides better protection than the 4v HPV vaccine, and that everyone, both male and female, can be vaccinated and can benefit from HPV vaccines.
Conclusion: Our findings revealed the social aspects involved in raising levels of vaccine awareness throughout Turkey. Overall, people still have doubts and concerns about HPV vaccination, and they are clearly worried about side effects. Physicians can take these concerns into consideration while providing clinical counseling in order to inhibit the spread of disease.

Keywords: vaccination, human papillomavirus, awareness

How to cite: Akcaoglu T, Ucar E, Dogan O. Evaluation of patient awareness of 4v and 9v HPV vaccines: A Turkish survey. J Surg Med. 2025;9(1):1-5.

Introduction

Vaccines against Human Papillomavirus (HPV) have been available in Europe since 2006. Vaccines are very effective at preventing infections and disease caused by different types of HPV. The combination of HPV vaccination and screening with HPV testing is the most effective approach to cervical cancer prevention [1]. However, hesitancy about vaccination is a global problem. With the HPV 9-valent (9v) vaccine accessible in Turkey as of 2023, efforts to raise awareness of vaccines among Turkish patients have accelerated. We asked 101 patients who applied for the HPV vaccine to answer a questionnaire; the goal was to better understand patient awareness levels of vaccines among patients who applied for the 4-valent (4v) and 9v HPV vaccines. We discuss our results in light of five topics: the demographics of the patients, their level of knowledge, their willingness to receive a vaccine, the factors that motivate them to receive a vaccine, and their awareness level of vaccines.

Materials and methods

A questionnaire was completed by 101 patients who visited the Obstetrics and Gynecology clinic for HPV vaccination beginning in 2023. Our goal was to determine patient awareness of different types of HPV vaccines. Patient awareness was evaluated based on the patients' demographics and their knowledge of cancer and cancer-screening methods. We also evaluated the patients' habits of receiving regular gynecological check-ups and their awareness of Pap smear screening.

We estimated study size assuming suitability for an exploratory investigation of awareness of HPV vaccines and related screening practices. While the sample was not large enough to draw highly complex statistical inferences, it is considered adequate for identifying trends and comparing awareness levels across different demographic groups. We expect that our findings will offer valuable insights that can guide further research and inform clinical practice, especially in the realm of improving HPV vaccination outreach and education.

Throughout the entire process of data collection and result evaluation, we took care to ensure that no potential sources of bias were present. Patients were selected based on their willingness to participate, and the data analysis was conducted in a systematic, objective manner. This protocol strengthens the reliability of our results; we expect that our cohort is a valid representation of the target population of HPV vaccine-seeking patients in this clinical setting.

Statistical analysis

The data obtained in the research were evaluated using IBM SPSS (version 22), and the categorical data were described as numbers and percentages. Our analytical approach involved several key steps to assess the relationships between demographic features and HPV vaccine awareness. We used descriptive statistics to summarize the participants' demographic characteristics, such as their age, education level, socioeconomic status, and geographic location. Comparative analysis was used to explore associations between these demographic variables and the participants' knowledge and attitudes toward HPV vaccination. We used the chi-squared test to determine the statistical significance of these associations, and we focused on categorical variables such as patient age, vaccine awareness, education level, and knowledge about a vaccine's effectiveness. Additionally, we made use of cross-tabulation to visually explore relationships between two categorical variables. Doing so providing a more detailed understanding of how factors such as age, education, and income intersect with awareness and perceptions of HPV vaccination. This multi-faceted approach allowed us to thoroughly evaluate the factors influencing vaccine awareness in the surveyed population.

Results

Patient demographics

All 101 patients who participated in the survey were female. Five patients (5%) were under the age of 18, and 58 patients (57%) were between the ages of 18 and 30. Twenty-five patients (25%) were between the ages of 31 and 40, and 10 patients (9%) were 41–50 years old. Finally, two patients (2%) were 51 years or older.

The majority of the patients were high school graduates (n=40, 40%), and 32 patients (32%) had a college degree. There were 12 (12%) primary school graduates, 11 (11%) elementary school graduates, and 6 individuals (6%) with a higher education degree (MD/PhD).

The monthly income of the patients was mostly below 10,000 Turkish Liras (TL) ($515 in US Dollars at that time) (n=74, 73%). Twenty-two patients (22%) had a monthly income of more than 10.000 TL, and only five patients (5%) had a monthly income above 20,000 TL ($1,030 US Dollars at that time).

Furthermore, 97% of the patients (n=98) lived in a city; just 3% (n=3) lived in a rural area (Table 1).

Table 1: Demographics of the patients who applied for HPV vaccination

Demographic Features		n (%)
Age	Under 18	5 (5)
	18–30	58 (57)
	31–40	25 (25)
	41–50	10 (9)
	51 or over	2 (2)
Sex	Female	101 (100)
	Male	0 (0)
Education Level	Primary School	12 (12)
	Elementary School	11 (11)
	High School	40 (40)
	College	32 (32)
	MD/PhD	6 (6)
Monthly Income	Less Than 10,000 TL	74 (73.3)
	10,000–20,000 TL	22 (22)
	More Than 20,000 TL	5 (5)
Place of Residence	City/Urban	98 (97)
	Rural	3(3)

Level of Knowledge

More than half of the patients who came to get vaccinated (60%) knew that there were more than 200 types of HPV, and 88% of them knew that HPV strikes globally and can affect people of any age. The majority of the patients (78%) were aware that HPV is generally sexually transmitted. Most of the patients (70%) furthermore knew that HPV is a serious disease that can be deadly. There was the most confusion around the issue of whether HPV affects fertility. A little more than half of the participants (57%) thought that HPV affects fertility. And 78% of the respondents thought that having an HPV infection would increase health costs. The most well-known symptom of HPV is warts (condyloma), roughly 89% of the patients were aware of it. And 86% of patients knew that some types of HPV can cause cervical cancer. Roughly 85% of patients believed that vaccination can protect against HPV

infection. Finally, about 83% of patients thought that cervical cancer could be prevented via the widespread use of vaccines (Table 2).

Table 2: Patients' knowledge of HPV

Knowledge		n (%)
There are more than 200 types of HPV viruses.	Yes/No	61 (60) / 40 (40)
HPV infection can occur worldwide and can affect any age group.	Yes/No	89 (88) / 12 (12)
HPV is usually transmitted to humans by sexual contact.	Yes/No	79 (78) / 22 (22)
HPV can be deadly.	Yes/No	71 (70) / 30 (30)
HPV affects fertility.	Yes/No	58 (57) / 43 (43)
HPV infection increases healthcare costs.	Yes/No	79 (78) / 22 (22)
Warts (condyloma) can be seen in patients infected with HPV.	Yes/No	90 (89) / 11 (11)
Some types of HPV can cause cervical cancer.	Yes/No	87 (86) / 14 (14)
It is possible to prevent HPV with vaccination.	Yes/No	86 (85) / 15 (15)
Cervical cancer can be prevented with the widespread use of vaccines.	Yes/No	81(83) / 17 (17)

Willingness

We also explored the willingness of the patients for vaccination. Although this questionnaire was administered to patients who applied for the vaccine; it is noteworthy that 57% of patients remarked that they were unaware of the vaccine (Table 3). Only 23% of patients were vaccinated before the new vaccine type (9v) was implemented in Turkey. The fact that 31% of individuals believed that the vaccine had no benefit and 35% believed that it was not safe suggests that roughly one out of every three people is not eager for the vaccination. About half of the respondents (43%) answered "I doubt the vaccine is effective", which shows that the fraction of people unwilling to receive the vaccine might be even higher. Furthermore, more than half of the respondents (57%) who had been vaccinated were worried about possible side effects. Efforts should accordingly be made to inform patients with evidence-based scientific data.

Table 3: Patient willingness to be vaccinated

Willingness		n (%)
I am informed about the vaccine.	Yes/No	43 (43) / 58 (57)
I've had the HPV vaccine before.	Yes/No	23 (23) / 78 (77)
I think the vaccine is beneficial.	Yes/No	70 (69) / 31 (31)
I think the vaccine is safe.	Yes/No	66 (65) / 35 (35)
I doubt the vaccine is effective.	Yes/No	43 (43) / 58 (57)
I am concerned about the possible side effects of the vaccine.	Yes/No	58 (57) / 43 (43)

Motivating Factors

Our goal was to understand patient motivation for getting vaccinated. We observed that the majority of patients (73%) were informed by their doctors and health workers (Table 4). Social media, TV, and advertisements were considered by 12%, 5%, and 1% of patients, respectively. Additionally, 9% of patients received the vaccination on the basis of a friend's recommendation. Over half of patients (69%) agreed that the vaccine protects against both warts (condyloma) and cervical cancer, 17% thought it protected them only from cervical cancer, and 5% thought that it protected them only from warts (condyloma). Roughly 9% of participants did not think that the vaccine conferred any protection. About half of patients (57%) noted that their getting vaccinated would not also protect their partner.

Table 4: Factors that motivate patients to get vaccinated

Motivators		n (%)
Where did you learn about the vaccine?	Social Media	12 (12)
	TV	5 (5)
	Ads	1 (1)
	Doctors or health workers	74 (73)
	Friend	9 (8.9)
What does the vaccine protect against?	Condyloma	5 (5)
	Cervical cancer	17 (17)
	None	9 (9)
	All	70 (69)
Do you think getting vaccinated will also protect your partner?	Yes	43 (43)
	No	58 (57)

Awareness Levels

We also sought to determine patient awareness of the importance of regular gynecological follow-ups, screening tests, and different vaccines.

Over half of patients (61%) did not know whether there were different vaccines developed to protect against HPV (Table 5). Only 36% of the patients stated that they received regular gynecological check-ups, and only 16% noted that they underwent regular Pap smear test screening (25% of patients stated that they were not sexually active). The majority of patients (67%) did not know whether the 9v HPV vaccine was more effective at preventing infections than the 4v HPV vaccine. Roughly the same fraction of patients (65%) did not know that both men and women can be vaccinated and benefit from the vaccine.

Table 5: Awareness of patients about HPV vaccines

Awareness		n (%)
There are different vaccines developed to protect against HPV.	Yes	26 (26)
	No	13 (13)
	I don't know	62 (61)
I receive regular gynecological checkups.	Yes	36 (36)
	No	65 (64)
I get Pap smears regularly.	Yes	16 (16)
	No	60 (59)
	I'm not sexually active.	25 (25)
The 9v HPV vaccine is more effective at preventing infections than the 4v HPV vaccine.	Yes	26 (26)
	No	7 (7)
	I don't know	68 (67)
Both men and women can be vaccinated and can benefit from the vaccine.	Yes	26 (26)
	No	9 (9)
	I don't know	66 (65)

Discussion

The United Kingdom switched to the 9v HPV vaccine in 2021, and it has been shown that replacing the 4v HPV vaccine with the 9v HPV vaccine can prevent a significant number of HPV-related cases/deaths amongst both women and men. Furthermore, the switch remains cost-effective in the range of 9v HPV vaccine price premiums [2]. With clinicians promoting the 9v HPV vaccine in Turkey, we wished to investigate patient of awareness HPV vaccines objectively using a cross-sectional survey.

Australia is viewed as a world leader in HPV vaccination. It was the first country to implement a fully funded national HPV vaccination program for girls in 2007 and boys in 2013. Although the program is perceived as quite successful, measures to further increase its impact and reduce potential threats are considered important [3]. Since a similar program has not been financed yet in Turkey, the motivation for people to get vaccinated largely stems from physicians and healthcare professionals.

The American Academy of Pediatrics (AAP) recommends starting an HPV vaccine sequence between the ages of 9 and 12 [4]. Our study showed that the parties interested in such vaccines in Turkey are mostly adults. One explanation for

that fact is that adequate information about HPV is still available in Turkey to children and adolescents.

According to the results of randomized controlled studies conducted in female patients aged 20–45 in China, both the 4v and 9v HPV vaccines are highly immunogenic and generally well tolerated [5]. Although robust data supporting that finding exist, we still note hesitancy among patients in our clinical practices. The primary concerns of our patients about the effectiveness of the vaccine are consistent with the data gathered from this survey.

In a cross-sectional study conducted in Ethiopia, people were known to have low knowledge of and low levels of willingness to receive HPV vaccines. Healthcare professionals should increase publicity about vaccination and inform families [6]. In the United States, a cross-sectional study was designed to increase the level of HPV education and knowledge among students receiving medical and dental education [7]. Another survey in the United States of women of reproductive age revealed low levels of knowledge and HPV vaccination rates [8]. Additionally, a cross-sectional study of students' knowledge of HPV vaccines in Algeria revealed the importance of establishing a social education policy to combat HPV-related cancers, particularly cervical cancer, and implementing a national HPV vaccination program targeting youth [9]. In Romania, a questionnaire was designed to investigate the attitudes of parents, high school students, medical students, and doctors about HPV vaccine. It has been emphasized that a community's adherence to appropriate preventive programs and information provided by health professionals are essential elements for reducing the risk of HPV-related cancers. Teachers and doctors are viewed as providers of relevant information about HPV infections. In this regard, sexual education classes and parent-teacher meetings could help spread the word about the basic features of HPV infections and preventive measures [10]. On the other hand, a cross-sectional study conducted with university students in Morocco investigated knowledge and awareness of HPV infection and awareness of cervical cancer. The results reveal that the participants did not possess sufficient knowledge about HPV infection and its complications [11].

It is believed that one of the factors affecting the low vaccination rate in the United States is parental exposure to misinformation on social media. To investigate that issue, a cross-sectional survey of 1,192 people was conducted in North Texas. The research team found that there was a need for interventions to improve web-based health literacy skills so that parents can protect their families from misinformation and make informed health decisions [12]. In our evaluation of a limited number of patients, the small number of participants under the age of 18 and the fact that the responders were generally informed by healthcare professionals are remarkable as distinguishing features of our community.

In 2022, a survey was conducted with 1438 female university students from four cities in China. It was found that confidence in the efficacy of vaccines, the perception of the risk of being infected with HPV, the price, and the distance/time are the factors that affect vaccine hesitancy [13]. Based on our study results, despite the high level of knowledge about infections, vaccine hesitancy still remains.

Limitations

Our cohort was entirely female, and we were accordingly unable to compare our findings with those of a study conducted in Switzerland that determined that vaccine hesitancy was more prevalent in men [14]. Additionally, our data were insufficient to evaluate school-age children with the implementation of a school-based immunization program in Singapore, the HPV vaccine coverage there increased [15].

Furthermore, our data were all compiled from a single center and derived from a limited number of patients. Demographic data such as socioeconomic status could be included in future studies.

Proposal for future research

We recommend focusing on critical knowledge gaps, understanding demographic influences on vaccination rates, and identifying strategies to overcome hesitancy and promote long-term health compliance. By prioritizing both HPV vaccinations and subsequent preventive care, the findings could lead to significant improvements in public health outcomes, help reduce the burden of HPV-related cancers and improve overall health and wellness across diverse populations.

Conclusion

Our findings provide valuable insights that can inform clinical practice and public health strategies. Our results indicate that HPV vaccination is most common among individuals of reproductive age, as well as those with a high school or undergraduate level of education. Interestingly, the majority of individuals seeking the vaccine reported having an income below average levels, which highlights a potential correlation between socioeconomic status and vaccination-seeking behavior.

While the participants demonstrated a strong awareness of the risks associated with HPV, particularly in relation to genital warts and cervical cancer, they remained uncertain about the vaccine’s effectiveness. Many individuals expressed concerns about the safety of the vaccine, with anxiety over possible side effects being notably high. Additionally, fewer than half of patients who had received the HPV vaccine reported receiving regular gynecological exams or Pap smears, which suggests a gap in ongoing preventive care following vaccination.

References

1. Joura EA, Kyrgiou M, Bosch FX, Kesic V, Nieminen P, Redman CW, et al. Human papillomavirus vaccination: The ESGO-EFC position paper of the European Society of Gynaecologic Oncology and the European Federation for colposcopy. Eur J Cancer. 2019 Jul;116:21-26. doi: 10.1016/j.ejca.2019.04.032. Epub 2019 Jun 1. PMID: 31163338.
2. Owusu-Edusei K, Palmer C, Ovcinnikova O, Favato G, Daniels V. Assessing the Health and Economic Outcomes of a 9-Valent HPV Vaccination Program in the United Kingdom. J Health Econ Outcomes Res. 2022 Jun 6;9(1):140-150. doi: 10.36469/001c.34721. PMID: 35795155; PMCID: PMC9170517.
3. Swift C, Dey A, Rashid H, Clark K, Manocha R, Brotherton J, et al. Stakeholder perspectives of Australia's national HPV vaccination program. Vaccines (Basel). 2022 Nov 21;10(11):1976. doi: 10.3390/vaccines10111976. PMID: 36423072; PMCID: PMC9692920.
4. O'Leary ST. Why the American Academy of Pediatrics recommends initiating HPV vaccine at age 9. Hum Vaccin Immunother. 2022 Nov 30;18(6):2146434. doi: 10.1080/21645515.2022.2146434. Epub 2022 Nov 20. PMID: 36404635; PMCID: PMC9746363.
5. Shu Y, Yu Y, Ji Y, Zhang L, Li Y, Qin H, et al. Immunogenicity and safety of two novel human papillomavirus 4- and 9-valent vaccines in Chinese women aged 20-45 years: A randomized, blinded, controlled with Gardasil (types 6/11/16/18), phase III non-inferiority clinical trial. Vaccine. 2022 Nov 15;40(48):6947-6955. doi: 10.1016/j.vaccine.2022.10.022. Epub 2022 Oct 22. PMID: 36283897.
6. Mihretie GN, Liyeh TM, Ayele AD, Belay HG, Yimer TS, Miskr AD. Knowledge and willingness of parents towards child girl HPV vaccination in Debre Tabor Town, Ethiopia: A community-based cross-sectional study. Reprod Health. 2022 Jun

10;19(1):136. doi: 10.1186/s12978-022-01444-4. PMID: 35689288; PMCID: PMC9188100.
7. Thanasuwat B, Leung SOA, Welch K, Duffey-Lind E, Pena N, Feldman S, et al. Human papillomavirus (HPV) education and knowledge among medical and dental trainees. J Cancer Educ. 2022 Aug 25:1-6. doi: 10.1007/s13187-022-02215-2. Epub ahead of print. PMID: 36002641; PMCID: PMC9402407.
8. Villavicencio A, Kelsey G, Nogueira NF, Zukerberg J, Salazar AS, Hernandez L, et al. Knowledge, attitudes, and practices towards HPV vaccination among reproductive-age women in a HIV hotspot in the US. PLoS One. 2023 Jan 19;18(1):e0275141. doi: 10.1371/journal.pone.0275141. PMID: 36656804; PMCID: PMC9851547.
9. Bencherit D, Kidar R, Otmani S, Sallam M, Samara K, Barqawi HJ, Lounis M. Knowledge and awareness of Algerian students about cervical cancer, HPV, and HPV vaccines: A cross-sectional study. Vaccines (Basel). 2022 Aug 29;10(9):1420. doi: 10.3390/vaccines10091420. PMID: 36146498; PMCID: PMC9505646.
10. Voidăzan TS, Budianu MA, Rozsnyai FF, Kovacs Z, Uzun CC, Neagu N. Assessing the level of knowledge, beliefs, and acceptance of HPV vaccine: A cross-sectional study in Romania. Int J Environ Res Public Health. 2022 Jun 6;19(11):6939. doi: 10.3390/ijerph19116939. PMID: 35682518; PMCID: PMC9180695.
11. El Mansouri N, Ferrera L, Kharbach A, Achbani A, Kassidi F, Rogua H, et al. Awareness and knowledge associated with human papillomavirus infection among university students in Morocco: A cross-sectional study. PLoS One. 2022 Jul 8;17(7):e0271222. doi: 10.1371/journal.pone.0271222. PMID: 35802731; PMCID: PMC9269923.
12. Thompson EL, Preston SM, Francis JKR, Rodriguez SA, Pruitt SL, Blackwell JM, et al. Social media perceptions and internet verification skills associated with human papillomavirus vaccine decision-making among parents of children and adolescents: Cross-sectional survey. JMIR Pediatr Parent. 2022 Sep 14;5(3):e38297. doi: 10.2196/38297. PMID: 36103216; PMCID: PMC9520398.
13. Huang Y, Chen C, Wang L, Wu H, Chen T, Zhang L. HPV vaccine hesitancy and influencing factors among university students in China: A cross-sectional survey based on the 3Cs model. Int J Environ Res Public Health. 2022 Oct 28;19(21):14025. doi: 10.3390/ijerph192114025. PMID: 36360905; PMCID: PMC9657119.
14. Kiener LM, Schwendener CL, Jafflin K, Meier A, Reber N, Schärli Maurer S, et al. Vaccine hesitancy and HPV vaccine uptake among male and female youth in Switzerland: A cross-sectional study. BMJ Open. 2022 Apr 21;12(4):e053754. doi: 10.1136/bmjopen-2021-053754. PMID: 35450894; PMCID: PMC9024257.
15. Vijaya K, Goei AHY. Improved population coverage of the human papillomavirus vaccine after implementation of a school-based vaccination programme: The Singapore experience. Singapore Med J. 2022 May 13. doi: 10.11622/smedj.2022053. Epub ahead of print. PMID: 35546141.