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ORIGINAL RESEARCH

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Awareness, attitudes and vaccination intentions regarding cervical cancer and HPV among healthcare workers

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Abstract

Background: Cervical cancer, primarily caused by high-risk human papillomavirus (HPV) types 16 and 18, remains a significant global health issue despite being preventable. While vaccination and screening can significantly reduce its burden, low awareness and insufficient vaccination rates persist. Although advancements in prevention strategies are available, the knowledge and attitudes of healthcare professionals toward HPV and cervical cancer prevention remain inconsistent, revealing a critical gap in research and practice. This study aimed to evaluate the knowledge and attitudes of healthcare workers toward cervical cancer and HPV, with a focus to detect prevention efforts. **Methods**: A descriptive and cross-sectional study was conducted at Gaziantep University Hospital between 12 November and 06 December 2024. Data were collected using a 55-item validated questionnaire, which included the Cervical Cancer Knowledge Scale and HPV Knowledge Scale. **Results**: A total of 324 participants, including doctors, nurses and medical secretaries, completed the survey. The mean cervical cancer knowledge score among participants was 6.02 (SD (Standard Deviation) = 2.19). Awareness scores were significantly different across age groups ($p < 0.001$) and professions ($p < 0.001$), with physicians scoring higher than nurses and medical secretaries. Vaccinated individuals had significantly higher knowledge scores compared to unvaccinated individuals ($p = 0.004$). Only 4.1% of participants were vaccinated, and just 1.2% planned to vaccinate their sons, compared to 17.9% for daughters ($p < 0.001$). **Conclusions**: These findings highlight the need for targeted training programs focusing on HPV vaccination, cervical cancer screening guidelines, and patient communication strategies to bridge the knowledge gap and enhance the role of healthcare workers especially for medical secretaries and nurses in cervical cancer prevention.

Keywords

Cervical cancer; Human papillomavirus (HPV); Family vaccination; Healthcare workers

1. Introduction

Cervical cancer is the third most prevalent form of cancer among women worldwide and has remained a significant global health concern. In 2022, approximately 662,000 new cases of cervical cancer were diagnosed, resulting in 348,000 deaths [1]. In comparison, in 2020 there were 604,000 new cases and 342,000 deaths [2]. The rising incidence and mortality rates highlight the persistent burden of this disease on global health systems [3, 4]. Cervical cancer is primarily caused by persistent infection with high-risk variants of the human papillomavirus (HPV) that predominantly transmits through sexual contact [2]. It is primarily attributed to chronic infection with HPV types 16 and 18, which are responsible for approximately 70% of all cervical cancer cases [5]. Persistent HPV infection significantly contributes to the development of cancerous lesions in both men and women [6].

The implementation of primary prevention through HPV vaccination is a highly effective strategy for averting the onset of numerous HPV-related illnesses, particularly cancers. Additionally, secondary prevention through cervical screening presents an additional opportunity for disease prevention [2, 6, 7]. The Papanicolaou test (Pap smear) and the HPV deoxyribonucleic acid (DNA) test are widely used tools for cervical cancer screening [8].

Despite the preventable nature of HPV infections, awareness remains low and vaccination rates are insufficient [5]. Several factors contribute to these gaps, including limited access to continuing professional education, inconsistent availability of updated guidelines and widespread misinformation are common barriers [9]. To address these challenges, the World Health Organization (WHO) has adopted the “90-70-90” strategy, which aims to eliminate cervical cancer by 2030. This strategy’s goal is to achieve vaccination of 90% of girls

before the age of 15, screen 70% of women and treat of 90% of those diagnosed with cervical cancer [2, 10]. However, despite the availability of HPV vaccines and organized cervical screening programs in Europe, local and international studies have indicated persistently low levels of awareness about HPV. This indicated that the program was not effectively promoted and the public was not adequately educated about the role of HPV in the etiology of cervical cancer [7]. In addition to HPV infection, several other factors increase the risk of cervical cancer, include smoking, immunosuppression, long-term use of birth control pills, multiple pregnancies and early initiation of sexual activity. The treatment options for these risks may include surgical, chemotherapeutic or radiotherapeutic procedures, depending on the condition of patients [5].

Healthcare professionals are one of the most trusted sources of health information. However, some healthcare professionals harbor personal hesitations, which can negatively affect not only their own health decisions but also their advice to patients and the community. This underscores the importance of understanding the knowledge, attitudes and practices of health professionals, even in today's rapidly evolving healthcare landscape [9]. This study aimed to enhance the effectiveness of prevention and awareness programs by investigating the knowledge levels and attitudes of healthcare workers regarding cervical cancer and HPV.

2. Materials and methods

2.1 Study type

A cross-sectional and descriptive study was carried out either by online or face-to-face administration of a 55-question survey form, which took approximately 30 minutes to complete.

2.2 Study participants

The study included participants aged 18–49 years who were employed as doctors, nurses or medical secretaries at Gaziantep University Hospital. To be eligible, participants were required to provide informed consent and complete the questionnaire completely. Individuals who did not meet these criteria, did not provide consent or submitted incomplete questionnaire form were excluded from the study. The sample size was calculated to be 324, based on a 95% confidence interval, a 5% margin of error and an assumed response rate of 50%.

After obtaining the approval from the local ethics committee (Decision No: 2024/338 Date: 23 October 2024) and the necessary permissions from the chief physician of the Gaziantep University Hospital, the study was started on 12 November 2024. Data collection concluded on 06 December 2024, upon reaching the target of 324 participants as determined by the power analysis.

2.3 Questionnaire

The survey form was developed by researchers after comprehensive review of the literatures, and using two scales validated in the Turkish language. The online survey was conducted online, free of charge through Google Forms. During both the online and face-to-face applications, the informed consent form was presented to the participants and only those who provided consent completed the questionnaire.

The survey form consisted of three parts. In the first part, socio-demographic characteristics of the participants were identified using nine questions. These questions covered age, sex, occupation, department, economic status, marital status, number of children and their age and sex. Additionally, the last 5 questions in this section explored participants' history of genital disease, awareness of cost-free HPV screening, and their vaccination status or plans to prevent HPV.

In the second part, the Cervical Cancer Knowledge Scale was used that comprises of eight items. Each correct answer was given 1 point and the total score varies between 0–8. Participants answered to the questions with "Yes", "No" and "Don't know". The "Don't know" option was included among the answers to prevent random responses. The Turkish validity and reliability of this scale were established by Ergöz Aksoy and Bilgiç [4].

The final section employed the HPV Knowledge Scale, which includes 33 items divided into four subscales: Subscale 1 (SS1), consisted of 16 questions about knowledge of HPV; Subscale 2 (SS2), comprises of 6 questions about HPV testing; Subscale 3 (SS3), consisted of 5 questions about the knowledge of HPV vaccine protection; and Subscale 4 (SS4) composed of 6 questions about knowledge of HPV vaccinations. Participants responded to each item with "Yes", "No" or "Don't know". Correct answers were scored as "1", while incorrect answers and "Don't know" responses were scored as "0". The total score obtained ranges from 0 to 33, with higher score indicating a high level of knowledge about HPV screening tests and the HPV vaccine. The Turkish validity and reliability of the HPV knowledge scale were confirmed by Demir Bozkurt and Özdemir [11].

2.4 Statistical analysis

Statistical analysis methods such as descriptive statistics, independent samples *t*-test, and one-way analysis of variance (ANOVA) were applied to evaluate the relationships between participants' HPV and Cervical Cancer Knowledge Levels, awareness and attitudes. Additionally, the relationships between awareness levels of different demographic groups were examined using correlation analysis.

The collected data were analyzed using the IBM SPSS Statistics 26.0 (Armonk, NY, USA). For descriptive measures, the minimum, maximum, mean, standard deviation, skewness and kurtosis coefficients were calculated. The assumption of normal distribution was evaluated by ensuring that the skewness and kurtosis coefficients were between -3 and +3. Parametric tests were applied to variables that met the normality condition, while alternative analysis methods were used for variables that did not.

Independent samples *t*-test and ANOVA were used to compare awareness scores across various demographic variables such as age groups, gender, profession, economic status, marital status and number of children. The relationships between HPV awareness and Cervical Cancer Knowledge Levels were assessed using the Pearson correlation coefficient.

Group analyses were conducted to investigate differences in knowledge and awareness based on HPV vaccination status, familiarity with HPV testing and Cervical Cancer Knowledge Levels.

3. Results

3.1 Demographic characteristics and mean score

The study analyzed the cervical cancer knowledge and HPV awareness levels among 324 healthcare workers. Of the total participants, higher number (58%) belonged to age-group 25–34 years and higher percentage (70.1%) were female. Professional doctors and nurses each constituted 44.8% of the total participants, while medical secretaries represented 10.5% of the study population. Economic status analysis revealed that 43.2% had equal income and expenses, while 30.2% had less income than expenses. In terms of marital status, 48.8% were married and 64.5% did not have children.

Participants exhibited a mean cervical cancer knowledge score of 6.02 (SD = 2.19) on an 8-point scale, indicating a moderately high awareness level. The HPV Knowledge Scale score averaged 19.84 (SD = 7.90) out of 33, reflecting a moderate awareness level (Table 1).

Key variables showed significant variations:

1. Awareness of HPV: 67.9% of participants were aware of HPV, but only 4.1% had been vaccinated against it.

2. HPV Testing Knowledge: Awareness of HPV testing scored an average of 3.10 (SD = 1.92) on a 6-point scale, reflecting moderate understanding.

3. HPV Vaccine Awareness: Awareness of HPV vaccination was moderate, with a mean score of 3.37 (SD = 1.61) on a 5-point scale.

3.2 Knowledge score across different age-group

Significant differences in knowledge and awareness were observed across different age-groups. Participants aged 25–34 had the highest HPV awareness and knowledge, with a mean HPV Knowledge Scale score of 21.75 (SD = 7.70). Awareness scores were lower in the groups aged 24 and below (mean = 17.47, SD = 5.86), and 35 and above (mean = 17.00, SD = 8.38) (Table 2).

3.3 Knowledge score across different profession

Doctors displayed the highest cervical cancer and HPV knowledge levels (mean cervical cancer score = 6.96, SD = 1.58; HPV Knowledge Scale = 25.59, SD = 4.60). Nurses and medical secretaries scored significantly lower, with medical secretaries having the least awareness (mean HPV Knowledge Scale score = 9.74, SD = 7.88). This disparity emphasizes the need for comprehensive training for non-physician staff (Table 3).

3.4 Knowledge score across groups with different vaccination status

Vaccinated individuals exhibited higher knowledge levels (mean cervical cancer knowledge score = 6.85, SD = 1.90) compared to those planning to vaccinate (mean = 6.18, SD = 1.91) and those not planning to vaccinate (mean = 5.59, SD = 2.42). Awareness of free cervical HPV screening was strongly associated with higher knowledge and vaccination rates (Table 4).

Only 1.2% of participants planned to vaccinate their sons, while 17.9% intended to vaccinate their daughters. Awareness was significantly higher among those planning to vaccinate both genders (mean HPV Knowledge Scale = 22.42, SD = 6.92) compared to those not planning any vaccination for their children (mean = 16.18, SD = 8.06) (Table 5).

Positive correlations were identified between cervical cancer knowledge and HPV awareness scores ($r = 0.655$, $p < 0.001$). The strongest correlations existed between having heard of HPV and HPV Knowledge Scale scores ($r = 0.942$, $p < 0.001$).

Despite moderate levels of awareness, only 45.2% of participants expressed intentions to vaccinate, revealing a significant gap in translating awareness into action. The limited awareness among medical secretaries highlighted the need for targeted interventions.

4. Discussion

This study evaluated cervical cancer knowledge and HPV awareness among healthcare workers, considering variables such as age, occupational groups and HPV vaccination status. The findings revealed significant differences in awareness and knowledge levels across these variables, aligning with and diverging from existing literature in certain aspects.

TABLE 1. Descriptive statistics for cervical cancer knowledge and HPV awareness variables.

Variable	n	Minimum	Maximum	Mean	SD
Cervical Cancer Knowledge Score	324	0.00	8.00	6.02	2.19
SS1: Score of knowledge about the HPV virus	324	0.00	16.00	10.97	3.79
SS2: Score of knowledge about HPV testing	324	0.00	6.00	3.10	1.92
SS3: Score of knowledge about HPV vaccine protection	324	0.00	5.00	3.37	1.61
SS4: Score of knowledge about HPV vaccination	324	0.00	6.00	2.39	1.70
Total HPV Knowledge Scale Score	324	0.00	32.00	19.84	7.90

HPV: human papillomavirus; SD: Standard Deviation.

TABLE 2. Cervical cancer knowledge and HPV awareness by age group.

Variable	Age Group	n	Mean	SD	*F*	*p*
Cervical Cancer Knowledge Score						
	≤24 yr	57	6.00	1.86		
	25–34 yr	188	6.21	2.15	2.328	0.099
	≥35 yr	79	5.58	2.45		
SS1: Score of knowledge about the HPV virus						
	≤24 yr	57	10.14	3.04		
	25–34 yr	188	11.85	3.62	13.325	<0.001*
	≥35 yr	79	9.49	4.11		
SS2: Score of knowledge about HPV testing						
	≤24 yr	57	2.02	1.54		
	25–34 yr	188	3.60	1.86	18.713	<0.001*
	≥35 yr	79	2.72	1.91		
SS3: Score of knowledge about HPV vaccine protection						
	≤24 yr	57	3.32	1.28		
	25–34 yr	188	3.64	1.57	8.206	<0.001*
	≥35 yr	79	2.78	1.77		
SS4: Score of knowledge about HPV vaccination						
	≤24 yr	57	2.00	1.30		
	25–34 yr	188	2.67	1.76	6.367	0.002*
	≥35 yr	79	2.00	1.69		
Total HPV Knowledge Scale Score						
	≤24 yr	57	17.47	5.86		
	25–34 yr	188	21.75	7.70	14.251	<0.001*
	≥35 yr	79	17.00	8.38		

**ANOVA. HPV: human papillomavirus; SD: Standard Deviation.*

4.1 Differences between age groups

The study identified age as a significant factor influencing HPV awareness and knowledge. Participants in the age-group 25–34 years had higher HPV awareness and knowledge scores, with an average score of 11.85 for having heard of HPV (PT1) compared to other age groups. This group also stood out in both subscales related to knowledge about HPV testing (PT2) and awareness of HPV vaccination (PT3) (Table 2). These findings are consistent with the results reported by Deguara *et al.* [7], who observed that women aged 25–35 exhibited a more positive attitude toward HPV awareness, cervical cancer screening and vaccination. These findings suggest that information on preventive health services, such as HPV vaccination, is generally more effective in this age group. It also suggests that specific campaigns should be organized to increase health awareness among younger and older individuals.

4.2 Differences between professional groups

Another important finding of this study is the significant difference in knowledge and awareness between professional groups. Physicians scored significantly higher than nurses and medical secretaries on all knowledge and awareness variables. For example, physicians have the highest mean score of 6.96 for cervical cancer knowledge. In contrast, nurses and medical secretaries had lower mean scores of 5.62 and 3.74 points, respectively (Table 3). Similarly, physicians stand out as the group with the highest level of awareness in variables such as having heard of HPV (PT1), and knowing about HPV testing (PT2). A study by Karasu *et al*. [12] among nurses in Istanbul, Turkey, showed the knowledge level of nurses to be 6.7 out of 10 aligning with the findings of this study.

The low knowledge score observed among professional groups such as nurses and medical secretaries highlight a critical issue, given their direct interaction with the public. The Cervical Cancer Knowledge Scale, validated in Turkish by Ergöz Aksoy and Bilgiç (2024), has proven to be an effective tool for assessing awareness levels [4]. The results of our study suggest that groups with low scores, particularly nurses and medical secretaries, require targeted educational interventions.

This difference between professional groups underscores the importance of providing comprehensive health education to all healthcare workers, not just physicians. The low level

TABLE 3. Cervical cancer knowledge and HPV awareness by profession.

Variable	Profession	n	Mean	SD	*F*	*p*
Cervical Cancer Knowledge Score						
	Doctor	145	6.96	1.58		
	Nurse	145	5.62	2.08	43.178	<0.001*
	Medical Secretary	34	3.74	2.69		
SS1: Score of knowledge about the HPV virus						
	Doctor	145	13.61	1.82		
	Nurse	145	9.59	2.95	153.170	<0.001*
	Medical Secretary	34	5.62	4.42		
SS2: Score of knowledge about HPV testing						
	Doctor	145	4.39	1.49		
	Nurse	145	2.24	1.52	98.970	<0.001*
	Medical Secretary	34	1.32	1.57		
SS3: Score of knowledge about HPV vaccine protection						
	Doctor	145	4.23	1.17		
	Nurse	145	2.94	1.50	66.096	<0.001*
	Medical Secretary	34	1.56	1.48		
SS4: Score of knowledge about HPV vaccination						
	Doctor	145	3.37	1.41		
	Nurse	145	1.68	1.50	61.002	<0.001*
	Medical Secretary	34	1.24	1.35		
Total HPV Knowledge Scale Score						
	Doctor	145	25.59	4.60		
	Nurse	145	16.46	5.96	156.199	<0.001*
	Medical Secretary	34	9.74	7.88		

**ANOVA. HPV: human papillomavirus; SD: Standard Deviation.*

of knowledge among medical secretaries may be due their limited access to direct health education on these subjects. These findings highlights the need to develop regular training programs to increase the knowledge of all health care workers.

Keten *et al.*'s [13] study on teachers found low awareness and knowledge of HPV and the HPV vaccine, with only 38.4% having heard of HPV and 25.7% aware of the vaccine. This study stated that this situation was due to reliance on the information from superficial sources such as the Internet and television. Similarly, our study found limited HPV awareness among healthcare workers. While 67.9% of participants reported being aware of the HPV vaccine, the vaccination rate was strikingly low at only 4.1%. These results suggest that lack of knowledge may contribute to vaccine hesitancy. Given that less than half of the participants were considering vaccination, it is clear that public health campaigns will play a critical role in overcoming these reservations [13]. In particular, informing community leaders such as teachers and health workers can be effective in raising general awareness.

4.3 The relationship between HPV vaccination and knowledge

Vaccination plays an important role in the prevention of HPV and cervical cancer. HPV vaccines have demonstrated significant success in reducing the incidence of cervical cancer by effectively targeting high-risk HPV types. For example, a 90% reduction in genital warts and high-risk HPV infections has been reported in countries where HPV vaccination has been introduced [13]. Despite these successes, knowledge gaps and trust issues remain among the general public regarding HPV vaccination. Individuals who had received the HPV vaccine were found to have a higher level of knowledge than those who plan to receive the HPV vaccine or those who had no intention in receiving the vaccine. The results of our study showed that the mean cervical cancer knowledge score was 6.85 for vaccinated individuals, 6.18 for those planning vaccination and 5.59 for those not planning vaccination (Table 4). Similarly, awareness of HPV vaccines (PT3) and knowledge about current HPV vaccines (PT4) were highest among vaccinated

TABLE 4. Cervical cancer knowledge and HPV awareness by HPV vaccination status.

Variable	Vaccination Status	n	Mean	SD	*F*	*p*
Cervical Cancer Knowledge Score						
	Vaccinated	53	6.85	1.90		
	Plan to vaccinate	124	6.18	1.91	7.191	0.001*
	Do not plan to vaccinate	146	5.59	2.42		
SS1: Score of knowledge about the HPV virus						
	Vaccinated	53	13.15	2.95		
	Plan to vaccinate	124	11.06	3.44	13.922	<0.001*
	Do not plan to vaccinate	146	10.08	4.02		
SS2: Score of knowledge about HPV testing						
	Vaccinated	53	4.42	1.67		
	Plan to vaccinate	124	3.12	1.88	19.569	<0.001*
	Do not plan to vaccinate	146	2.60	1.81		
SS3: Score of knowledge about HPV vaccine protection						
	Vaccinated	53	4.15	1.28		
	Plan to vaccinate	124	3.56	1.44	13.398	<0.001*
	Do not plan to vaccinate	146	2.93	1.72		
SS4: Score of knowledge about HPV vaccination						
	Vaccinated	53	3.75	1.34		
	Plan to vaccinate	124	2.40	1.59	27.736	<0.001*
	Do not plan to vaccinate	146	1.88	1.63		
Total HPV Knowledge Scale Score						
	Vaccinated	53	25.47	6.43		
	Plan to vaccinate	124	20.15	7.12	22.826	<0.001*
	Do not plan to vaccinate	146	17.48	7.96		

**ANOVA (One participant was excluded from the analysis as they did not provide information about their vaccination plan). HPV: human papillomavirus; SD: Standard Deviation.*

participants.

These finding show that the decision to receive HPV vaccine is directly related to the level of knowledge. Existing literature also shows that low awareness has a negative impact on HPV vaccination rates. A study conducted by Deguara *et al.* [7] (2020) in Malta reported that low HPV awareness decreased vaccination rates. Similarly, a study carried out at the University of North Carolina revealed that while 37% of men were considering HPV vaccination, only 63% were aware of the vaccine's existence [14]. These studies underscore the critical role of education and awareness in improving HPV vaccination rates.

Another study conducted in Turkey found that only 4% of male nurses were vaccinated against HPV. Similarly, our study reported that individuals with a low level of knowledge were less likely to be vaccinated against HPV [12]. The low level of knowledge among individuals who do not plan to be vaccinated highlights the need for special awareness campaigns targeting such group. The literature supports the effectiveness of such campaigns in improving vaccination rates. For example, the WHO's "90-70-90" strategy emphasizes that raising awareness is critical to achieving vaccination goals [10].

Our findings regarding childhood vaccination intentions align with trends reported in the literature. In our study, only 1.2% of participants planned to vaccinate their sons, while 17.9% reported planning to vaccinate their daughters. Prioritizing girls for HPV vaccination is often emphasized in the literature [14–16]. Given that HPV can cause serious health problems in both sexes, there is a need for educational efforts to promote vaccination for boys as well [6].

4.4 Strengths, advantages and limitations of the study

This study has several strengths that increase its validity and relevance in understanding healthcare professionals' knowledge, attitudes and practices regarding cervical cancer and HPV. First, the inclusion of different groups of health professionals, such as doctors, nurses and administrative staff, allows for a comprehensive analysis of differences across professional roles. Second, the use of validated questionnaires ensures the reliability and comparability of the data collected. Third, the study fills a critical gap in the literature by focusing on the intentions and practices of health professionals, which plays a fundamental role in increasing public awareness and immu-

TABLE 5. Cervical cancer knowledge and HPV awareness by child vaccination intentions.

Variable	Child Vaccination Intentions	n	Mean	SD	*F*	*p*
Cervical Cancer Knowledge Score						
	Plan to vaccinate daughters	58	6.69	1.70		
	Plan to vaccinate both genders	135	6.38	2.05	12.473	<0.001*
	Do not plan to vaccinate	127	5.28	2.35		
SS1: Score of knowledge about the HPV virus						
	Plan to vaccinate daughters	58	11.78	2.93		
	Plan to vaccinate both genders	135	12.11	3.07	22.899	<0.001*
	Do not plan to vaccinate	127	9.28	4.22		
SS2: Score of knowledge about HPV testing						
	Plan to vaccinate daughters	58	3.50	1.88		
	Plan to vaccinate both genders	135	3.55	1.95	14.756	<0.001*
	Do not plan to vaccinate	127	2.39	1.70		
SS3: Score of knowledge about HPV vaccine protection						
	Plan to vaccinate daughters	58	3.62	1.61		
	Plan to vaccinate both genders	135	3.82	1.30	15.810	<0.001*
	Do not plan to vaccinate	127	2.78	1.74		
SS4: Score of knowledge about HPV vaccination						
	Plan to vaccinate daughters	58	2.48	1.52		
	Plan to vaccinate both genders	135	2.94	1.64	18.422	<0.001*
	Do not plan to vaccinate	127	1.73	1.64		
Total HPV Knowledge Scale Score						
	Plan to vaccinate daughters	58	21.38	6.75		
	Plan to vaccinate both genders	135	22.42	6.92	25.218	<0.001*
	Do not plan to vaccinate	127	16.18	8.06		

**ANOVA (Four participants were excluded from this analysis as they did not provide responses regarding their child vaccination intentions). HPV: human papillomavirus; SD: Standard Deviation.*

nization rates. Finally, by highlighting specific knowledge gaps and barriers, the study provides actionable insights for designing targeted education and intervention programs.

Despite these important findings, the study has also some limitations. Firstly, the findings may not be generalizable because the study was conducted in a single health center. Secondly, due to the cross-sectional design, cause-and-effect relationships between HPV awareness and vaccination behavior could not be assessed. Future research should address these limitations by collecting data from different regions and larger, more diverse sample groups. Addressing these limitations will further contribute to the development of effective interventions aimed at increasing HPV awareness and vaccination rates.

5. Conclusions

This study explored the impact of age, professional roles and HPV vaccination status on awareness of cervical cancer and HPV. The findings indicate that awareness is notably higher among younger individuals and physicians, while groups such as nurses and medical secretaries exhibit lower levels of knowledge, underscoring the need for targeted education initiatives. Furthermore, the strong association between HPV vaccination and knowledge levels highlights the importance of awareness campaigns in improving vaccination rates.

To address these gaps, we recommend implementing targeted education programs, particularly for healthcare professionals with lower knowledge levels, such as nurses and medical secretaries. These efforts should prioritize HPV awareness campaigns among both healthcare professionals in direct contact with patients and the general public, which can play a pivotal role in dispelling misconceptions, fostering trust in HPV vaccination and ultimately increasing vaccination uptake. It's also important to consider that education can play a critical role in achieving the WHO's "90-70-90" strategy to eliminate cervical cancer.

6. Highlights

- HPV awareness varied significantly across age groups and professional roles.
- Despite 67.9% of participants being aware of the HPV vaccine, only 4.1% were vaccinated.
- Physicians demonstrated higher levels of HPV knowledge

compared to nurses and medical secretaries.

• A small proportion of participants (1.2%) intended to vaccinate their sons, while 17.9% considered vaccination for their daughters.

• Targeted education programs are crucial to enhance awareness and reduce vaccine hesitancy.

AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

AUTHOR CONTRIBUTIONS

YBA—designed the research study, performed the research, analyzed the data, wrote the manuscript, edited and finalized the manuscript. AÇÇ—designed the research study, performed the research, analyzed the data, wrote the manuscript. Both authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethics committee approval was received from Gaziantep University for the study (Decision No: 2024/338 Date: 23 October 2024). All procedures adhered to the ethical standards outlined in the Helsinki declaration and its subsequent amendments or equivalent ethical standards. Informed consents were obtained from all participants prior to data collection.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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