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Knowledge, Attitudes and Practices Towards HPV Vaccination among Albanian Women: An Effort to Improve HPV Vaccine Acceptance

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Abstract:

Introduction: Cervical cancer is among the most common cancers affecting women worldwide. Despite efforts to reduce its incidence, it remains the fifth most frequent cancer among women in Albania. In November 2022, Albania included the quadrivalent HPV vaccine in the National Immunization Program, targeting 13-year-old young women. Therefore, this study aims to assess HPV vaccine awareness among Albanian women and to delineate deficiencies in knowledge, accessibility, and attitudes within populations at higher risk of HPV exposure.

Methods: This cross-sectional study, conducted from September to December 2024, surveyed 398 Albanian women using a convenience sampling method. The questionnaire was pilot-tested for clarity and included sections covering socio-demographic information, HPV vaccination practices, and awareness of preventive health measures. A p-value of <0.05 was considered statistically significant.

Results: Knowledge about HPV vaccination practices varied significantly by age, education, marital and employment status. Married participants (67.3%), those employed in the healthcare sector (87.5%), and urban residents (68.2%) were significantly more informed about the intended recipients of the HPV vaccine ($p = 0.045$, $p = 0.003$, $p < 0.001$, respectively). Additionally, 46.5% of participants would consider getting vaccinated with age ($p = 0.007$) and education level ($p = 0.002$) emerging as significant determinants.

Discussion: The study demonstrated moderate awareness and vaccine acceptance among Albanian women following the recent introduction of the HPV vaccine. Consistent with global findings, education level was observed to influence attitudes significantly. Future targeted research that overcomes potential limitations, such as online sampling bias, is needed to address vaccine hesitancy and socio-cultural barriers.

Conclusions: The HPV vaccine acceptance rate requires improvement, as more than one-third of participants remain undecided about receiving the vaccine. The study highlights the necessity of targeted educational interventions and comprehensive strategies to enhance HPV vaccine acceptance and coverage. In the Albanian context, achieving the World Health Organization's goal of 90% immunization among adolescent girls by 2030 may require addressing specific socioeconomic barriers and increasing healthcare providers' involvement.

Keywords: HPV vaccination, Public health, Prevention strategy, Albanian women, Herd immunity, High-risk HPV types.

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1. INTRODUCTION

The World Health Organization (WHO) reports that cervical cancer is the fourth most common cancer among women and the ninth leading cause of cancer-related deaths worldwide [1, 2]. Even though this type of cancer remains one of the most life-threatening, especially in low and middle-income countries, it is also one of the most preventable ones [3].

HPV infection is frequently detected in the anogenital tract of both men and women, regardless of the presence of clinical lesions. HPV infection can lead to a range of cervical morphological changes, such as various stages of precancerous lesions (CIN-1, minor dysplasia; CIN-2, moderate dysplasia; CIN-3/CIS, severe dysplasia or carcinoma *in situ*) and invasive cervical cancer [4].

Recognizing the critical need to address the rising incidence of cervical cancer and to accelerate the elimination, WHO in November 2020 launched the Global Strategy for Cervical Cancer Elimination by setting concrete goals to be achieved by 2030 [5]. In this context, all countries are required to reduce cervical cancer incidence to less than four cases per 100,000 women [6].

HPV vaccines are the most effective measure for preventing HPV infections and lowering the lifetime risk of developing cervical cancer. The vaccination against HPV promotes herd immunity, reducing the overall prevalence of HPV and the risk of infections from high-risk HPV types that may lead to cancer.

Five HPV vaccines are currently prequalified by WHO, namely Cecolin® (2vHPV/ bivalent HPV vaccine, manufactured by Xiamen Innovax Co.Ltd), Cervarix™ (2vHPV, manufactured by GlaxoSmithKline Biologicals), Walrinvax® (2vHPV, manufactured by Walvax Biotechnology Co. Ltd), Gardasil® (4vHPV/ quadrivalent HPV vaccine, manufactured by Merck Vaccines), and Gardasil-9® (9vHPV/ nonavalent HPV vaccine, manufactured by Merck Vaccines). The safety of these vaccines has been ensured by the WHO prequalification process and by the Global Advisory Committee on Vaccine Safety (GACVS) [7]. In addition, one more HPV vaccine (Cervavac®) is nationally licensed but not yet WHO-prequalified.

Since 2006, the Advisory Committee on Immunization Practices (ACIP) has recommended routine HPV vaccinations for females, expanding the recommendation to include males in 2011 [8]. Moreover, in April 2022, the Strategic Advisory Group of Experts (SAGE) on Immunization, WHO's principal advisory group for vaccines and immunization, reported that a one-dose HPV vaccine schedule provides comparable protection against HPV compared to a two or more regimen [9].

The latest statistics indicate that cervical cancer ranks as the fifth most frequent cancer among women in Albania and the second most common cancer among women between 15 and 44 years of age [10]. Despite several significant actions and public health policy reforms implemented in Albania during the past decade, providing the opportunity for primary prevention of cervical cancer was clearly the most crucial advancement. In this context, on November 2022, a significant milestone was achieved in Albania with the inclusion of the quadrivalent recombinant HPV vaccine (Gardasil®) in the National Immunization Program (NIP). Unlike in many other countries where the HPV vaccine is routinely recommended for both males and females, in Albania, the HPV vaccine is provided free of charge exclusively to young women aged 13 years old. Recently, the Institute of Public Health in Albania launched an important initiative aiming to temporarily extend free vaccination eligibility to the age group of 14-20 years old young women. This effort was initiated in January 2024 and aims to increase vaccine coverage and reduce the prevalence of HPV-related diseases [11]. Based on the evaluation of the National Committee of Experts on Immunization and SAGE recommendations, the HPV vaccine in Albania is administered as a single dose.

Since HPV vaccination in Albania has been recently included in the NIP, official data regarding the HPV vaccination coverage are not available yet. On the other hand, a poor understanding of the risks associated with HPV infection, combined with the perception of not being at risk of contracting HPV, significantly contributes to vaccination hesitancy, negative attitudes, and ineffective vaccination programs [12, 13].

This study aims to assess awareness, knowledge, and attitudes toward the HPV vaccine among Albanian women and to examine how these vary across different age groups and socio-demographic characteristics.

2. MATERIALS AND METHODS

2.1. Study Design

This cross-sectional study was conducted between September and December 2024 using a convenience sampling method, where participants were recruited through an anonymous online questionnaire based on their willingness to participate. The questionnaire was generated through Google Forms and distributed to women aged 15 and above. Before administering the survey, participants were informed about the study's objectives, methods, and data confidentiality. Given the ethical considerations associated with research involving minors aged 15-17 years, obtaining parental consent was essential prior to participation. Participants were instructed to provide their parents or guardians with a link to the informed consent form. The form included a section where guardians could electronically indicate their approval by selecting a checkbox. The questionnaire was developed by consulting previous validated questionnaires and then contextualizing several questions to ensure alignment with the study objectives and feasibility within the current setting [14-17]. The questionnaire was subsequently translated into Albanian, and to ensure its linguistic accuracy and overall comprehensibility, it underwent a face-to-face pilot testing with a small group of 10 women from the target population. Based on

participant feedback, no substantial modifications were necessary, confirming the questionnaire's clarity and appropriateness for the target population.

This study complies with the principles of the Declaration of Helsinki and was approved by the Ethics Committee of the Catholic University "Our Lady of Good Counsel" in Tirana, Albania (Prot. Nr. 630 of 16/12/2023).

2.2. Study Instrument

The questionnaire included three sections. Section A was designed to collect participants' socio-demographic data. Section B addressed HPV vaccination practices (knowledge regarding the intended recipients of the HPV vaccine, and willingness to recommend the vaccine to family and friends), while Section C focused on assessing awareness of preventive measures.

2.2.1. Socio-demographic Variables

The sociodemographic variables included age, place of residence, educational background, marital and employment status. Age ranges were used to facilitate comparisons with similar studies or national datasets, while also allowing for statistical analysis to identify trends and patterns across wider age groups. The "Other" category in educational background included participants with postgraduate education (master's degree, PhDs, or specialized higher education). Furthermore, individuals who did not complete formal education through traditional routes were also classified under this category.

2.2.2. HPV Vaccination and Preventive Measure Outcomes

The questionnaire sections B and C included three types of questions structured as follows: closed-ended questions with options limited to "*Yes*" and "*No*" options, closed-ended questions offering "*Yes*", "*No*," and "*Not sure*" options, and multiple-choice questions allowing respondents to choose the answer that best represents their viewpoint or experience. Participants were asked to indicate the best way they believe prevents cervical cancer, the intended recipients of the HPV vaccine, their willingness to recommend the vaccine to family and friends, and report whether they had heard of the Pap test and if they had undergone it in the past.

The knowledge/ attitude score for these sections was calculated by awarding 1 point for each correct/ confirming answer and 0 points for each incorrect/ negative or unknown answer. Additionally, for each incorrect answer in the multiple-choice questions, 1 point was subtracted. Respondents with a percentage of correct answers above 50% were considered to have an acceptable level of knowledge about the HPV vaccine and the main preventive measure. Participants who answered "*Yes*" to the question "*Would you recommend the HPV vaccination to family and friends?*" were classified as having a positive behavior regarding HPV vaccination practices.

2.3. Sample Size

Women aged 15 years and older were included in this study. For analytical purposes, participants were further categorized into three age groups: 15–17 years, 18–30 years, and 31 years and above. Moreover, this study excluded non-Albanian residents to ensure that the findings accurately represent the context of Albania's public health system and vaccination program.

The sample size was calculated using Cochran's formula: $n = [(Z^2 * p * (1-p)]/ E^2$, where Z is the standard normal deviation (1.96), p is the estimated proportion of the population with the characteristic of interest, and E is the margin of error (0.05). As a result, the minimum required sample size to ensure statistical representativeness was calculated to be 384 participants [18]. Data were collected from 413 respondents, of whom 15 did not fully complete the survey. As a result, 398 fully completed questionnaires were included in the statistical analysis.

2.4. Statistical Analysis

The results from Google Forms were exported to Microsoft® Excel spreadsheets for statistical analysis, which was conducted using the Statistical Package for Social Sciences (SPSS, Version 27.0, IBM). Descriptive statistics, such as frequencies and percentages, were used to describe the characteristics of the study population. Cross-tabulation and Chi-square (χ^2) tests were performed to determine the association between sociodemographic characteristics and outcome variables. A p-value of <0.05 was considered statistically significant.

3. RESULTS

3.1. Socio-demographic Profile of Participants

The socio-demographic characteristics of the study respondents are presented in Table **1**. The majority of respondents (56.0%) were 31 years and older, followed by those aged 18-30 years (37.7%). Urban residents constituted the majority (67.8%) compared to rural ones (32.2%). Most respondents (72.9%) had completed high school and were currently pursuing university education.

Table 1. Demographic characteristics of the study participants (n= 398).

Socio-demographic Profile	Category	Frequency	%
Age group	15-17 18-30 31+	25 150 223	6.3 37.7 56.0
Place of residence	Urban Rural	270 128	67.8 32.2

(Table 1) contd.....

Socio-demographic Profile	Category	Frequency	%
Educational background	High school University Other	90 290 18	22.6 72.9 4.5
Marital status	Single Married Widowed/ divorced	210 165 23	52.8 41.4 5.8
Employment status	Not employed Working in healthcare sector Other professions	155 45 198	38.9 11.3 49.8

Table 2. Frequency distribution of questionnaire answers among the total participants.

HPV Vaccine Knowledge and Attitudes Data			
Variables	**Category**	**Frequency**	**%**
Who is the HPV vaccine intended for?	For every girl before sexual activity	250	62.8
	For women diagnosed with cervical cancer	30	7.5
	Not sure	118	29.7
Did you know that the HPV vaccine is also available in community pharmacies in Albania?	Yes	150	37.7
	No	248	62.3
Would you recommend the HPV vaccination to family and friends?	Yes	220	55.3
	No	40	10.1
	Not sure	138	34.6
What do you believe is the best way to prevent cervical cancer?	Maintaining personal hygiene	80	16.0
	Getting vaccinated	130	26.0
	Using contraception	70	14.0
	Eating a healthy diet	30	6
	All the above	190	38.0
Preventive measures and HPV vaccination practices questions			
Do you know what a Pap smear/Pap test is?	Yes, I have heard about it	350	87.9
	No, I don't know	48	12.1
Have you ever undergone a Pat test?	Yes, I have	120	30.2
	No, I have not	278	69.8
Who encouraged you to take the Pap test?	I decided on my own	25	20.8
	My gynecologist	42	35.0
	Another healthcare provider	22	18.3
	A family member or friend	9	7.5
	I don't remember	22	18.4
Would you consider getting the HPV vaccine?	Yes, I would	185	46.5
	No, I would not	75	18.8
	Not sure	138	34.7

The distribution of marital status showed that 52.8% were single, 41.4% married, and 5.8% widowed or divorced. Nearly half (49.8%) were employed in non-healthcare roles, while 38.9% were unemployed.

3.2. HPV Vaccine Knowledge and Attitudes

As shown in Table **2**, participants were asked, *"Who is the HPV vaccine intended for?"* and 62.8% of them correctly identified that the vaccine is intended for women before sexual activity. The respondents' knowledge of the HPV vaccine eligible category varied significantly by age ($p < 0.001$). Among those aged 15-17 years old, only 38.7% knew about the recommended HPV vaccine recipients. In contrast, the highest percentage of knowledge (61.2%) was observed among interviewees between 18-30 years old. Knowledge about vaccine availability remains limited, with 62.3% unaware that the HPV vaccine can be accessed in community pharmacies in Albania. Despite this, a majority (55.3%) would recommend the vaccine to family and friends, though a notable proportion (34.6%) remained undecided. When asked about cervical cancer prevention, 38.0% recognized a multi-faceted approach including vaccination, hygiene, cont-raception, and diet as the most effective strategy, while 26.0% specifically highlighted vaccination.

3.3. Relationship Between HPV Vaccine Perceptions and Demographic Factors

Out of the total 398 participants, 55.3% expressed a willingness to recommend the HPV vaccine to family and friends. Age, place of residence, educational background, and employment status were significant factors influencing this

aspect Table **3**. Specifically, younger participants (15-17 years old) were the least likely to recommend the vaccine. Participants living in urban areas ($p = 0.008$), those attending university education ($p < 0.001$), and those working in the healthcare sector ($p = 0.003$) were more prone to recommend the vaccine to others (classified as those with a positive behavior regarding HPV vaccination practices).

Additionally, 67.3% (95% CI: 60.1% - 74.5%) of married participants were more informed about the HPV vaccine eligible population ($p = 0.045$). Another factor influencing the level of knowledge regarding this question was associated with employment status ($p = 0.003$). Among those employed in the healthcare sector, 87.5% were well informed about the HPV vaccine's recommended recipients, compared to 55.3% of unemployed respondents.

A willingness to receive the HPV vaccine was expressed by 46.5% of respondents, who answered "*Yes*" to the question "*Would you consider getting the HPV vaccine?*". However, a significant proportion (34.7%) were still undecided. Sociodemographic factors such as place of residence ($p = 0.820$) and marital status ($p = 0.260$) did not emerge as significant determinants (Table **3**). However, age ($p = 0.007$) and educational background ($p = 0.002$) significantly influenced respondents' predisposition to get vaccinated. Thus, interviewees aged 18-30 years appeared more predisposed. Additionally, the association between interviewees' willingness to get the HPV vaccine and the level of education was found to be statistically significant ($p = 0.002$). Among those who worked outside the healthcare system, 39.6% were predisposed to get the vaccine.

3.4. Knowledge and Attitude Towards Screening Programs

Urban participants were significantly more informed about Pap smears (87.8%) compared to rural participants (76.9%), suggesting geographic disparities in health information dissemination (Table **4**). Statistically significant associations were found between respondents' age, place of residence, educational background, marital/employment status, and the awareness toward Pap smears ($p < 0.05$). While overall knowledge of Pap smears was high, particularly among university-educated (90.2%) and married individuals (95.8%), actual participation in screening remained significantly lower, especially among younger (5.7% for ages 15–17) and less-educated participants (14.0% for those with only a high school education). Screening rates increased with age (44.0% for those 31 and older), education (32.8% for university graduates), and professional exposure, with healthcare workers demonstrating the highest engagement (45.7%). Married (53.0%) and widowed/divorced (42.0%) participants were more likely to have undergone a Pap smear compared to single participants (11.5%) (Table **4**).

Participants were also asked to identify who encouraged them to undergo Pap smears. A substantial number of respondents (35.0%) were advised by their gynecologist, indicating that healthcare professionals play a significant role in encouraging this important screening. While 20.8% had undergone this test based on their awareness of its significance, reflecting a proactive approach to health. Finally, 7.5% were encouraged by family members or friends, suggesting that personal networks also play a role in influencing decisions about health screenings.

Table 3. Factors associated with knowledge and attitude towards the HPV vaccine.

Variable	Willing to Recommend HPV Vaccine to Family and Friends				Correctly identified whom the HPV Vaccine is Intended for				Consider Getting Vaccinated			
	n	%	χ^2	*p*	n	%	χ^2	*p*	n	%	χ^2	*p*
Age group 15-17	9	33.0	4.120	**0.039**	12	38.7	28.950	**<0.001**	10	32.1	16.890	**0.007**
18-30	92	56.6			104	61.2			98	51.5		
31+	120	55.2			98	59.8			85	42.8		
Place of residence Urban	164	58.6	16.932	**0.008**	198	68.2	10.970	**<0.001**	150	46.1	13.375	0.820
Rural	57	46.5			65	53.5			55	41.5		
Educational background High school	29	35.6	16.845	**<0.001**	41	48.3	10.730	**0.021**	31	32.9	16.700	**0.002**
University	192	60.2			225	64.5			170	48.2		
Other	2	31.5			4	52.0			2	32.1		
Marital status Single	130	54.3	1.452	0.385	143	57.2	9.452	**0.045**	118	46.1	4.970	0.260
Married	97	55.1			115	67.3			79	45.7		
Widowed/divorced	7	38.2			12	64.0			5	27.5		
Employment status Not employed	98	51.9	14.730	**0.003**	109	55.3	15.820	**0.003**	94	47.1	15.320	**0.002**
Working in healthcare sector	27	86.2			29	87.5			23	72.5		
Other professions	110	52.0			140	63.0			80	39.6		

Table 4. Factors associated with HPV vaccine availability and cervical cancer screening.

Variable	Knowing the HPV Vaccine is also Available in Community Pharmacies				Heard of Pap Smears/ Test				Undergone a Pap Test in the Past			
	n	%	χ^2	*p*	n	%	χ^2	*p*	n	%	χ^2	*p*
Age group 15-17	8	24.2	2.610	0.430	16	50.0	47.560	**<0.001**	2	5.7	92.500	**<0.001**
18-30	72	38.5			150	81.1			20	10.5		
31+	62	35.4			167	92.5			80	44.0		
Place of residence Urban	120	36.5	0.075	0.785	285	87.8	8.450	**0.003**	110	34.0	9.900	**0.002**
Rural	50	37.3			100	76.9			25	20.2		
Educational background High school	22	27.2	5.210	0.072	58	67.4	25.780	**<0.001**	12	14.0	9.746	0.007
University	140	39.1			320	90.2			130	32.8		
Other	3	25.0			6	75.0			3	33.3		
Marital status Single	88	34.6	3.890	0.140	195	76.8	32.970	**<0.001**	28	11.5	97.595	**<0.001**
Married	67	36.9			175	95.8			100	53.0		
Widowed/divorced	11	54.0			20	95.2			9	42.0		
Employment status Not employed	80	40.2	3.850	0.140	148	74.0	35.990	**<0.001**	14	8.0	81.889	**<0.001**
Working in healthcare sector	14	41.0			34	100.0			16	45.7		
Other professions	74	32.4			216	92.5			108	47.0		

4. DISCUSSION

Despite global efforts to reduce cervical cancer through HPV vaccination, challenges in awareness and accessibility persist, particularly in specific populations. The uncertainty about vaccination among one-third (34.7%) of the participants in this study may be attributed to the recent introduction of the HPV vaccine into Albania's immunization program, as well as significant barriers, including widespread misconceptions about the vaccine. However, nearly half of the participants reported a willingness to receive the vaccine and recommend it to others. Notably, those aged 18-30 years were more likely to undergo vaccination. This is consistent with findings from other studies reporting similar positive attitudes toward vaccination among this subgroup [19-21].

On a global scale, HPV vaccine coverage among adolescent girls was just 15% in 2019, underscoring persistent challenges despite varied healthcare systems among countries [22, 23]. However, recent WHO data report a gradual improvement in coverage, increasing from 20% in 2022 to 27% in 2023 [24].

A study conducted in China from 2017 to 2022 found consistently low HPV vaccination rates (below 7%) across all age groups of females aged 9–45, despite evidence from other studies indicating that most participants were willing to get vaccinated if the vaccine was offered at no cost [25, 26].

Interesting results were also reported by a study conducted among young females in Jakarta, Indonesia, indicating a strong willingness for vaccination (95%), particularly when parental permission was granted [27]. This highlights the crucial role of parental influence in shaping health behaviors. Studies in behavioral science and public health consistently show that parental attitudes and education level strongly influence adolescents' health decisions [28]. Given this, efforts to promote HPV vaccination in Albania should not only target adolescents but also actively involve their parents (especially those of young women aged 13–20) by providing them with accurate information about the vaccine's benefits and importance.

In the present study, more than half of the respondents correctly identified the HPV vaccine eligible population, although awareness varied significantly across socio-demographic groups. A similar study conducted in Poland found that only 31.9% of adults were aware of the HPV vaccine-eligible population, highlighting the considerable gap in awareness even within European contexts [29]. Only one third of our participants aged 15–17 recognized that the vaccine is intended for individuals prior to sexual activity, likely due to limited or a lack of targeted information campaigns. In contrast, adult women, especially those over 31 years old, exhibited higher awareness, which may be attributed to their accumulated life experience, greater access to health information, and more consistent involvement with healthcare services throughout their lives. On the other hand, consistent with other studies, we observed that higher education levels (university attenders and postgraduates) are generally associated with increased awareness of the HPV vaccine [30-35].

Recent studies in Albania have explored HPV-related knowledge and attitudes among university students, revealing gender-based discrepancies in awareness. For instance, Merkuri *et al*. reported that only 18.9% of the participants enrolled in the survey (female university students) recognized the HPV vaccine as a preventive

method, while Bakiri *et al.* found that 45.3% of male students were aware of the protection provided by the HPV vaccine [36, 37]. Moreover, various studies have shown that women are more likely to accept HPV vaccination than men, even when both genders have access to free vaccination [38-40]. Effectively addressing this gender disparity is essential to reducing HPV transmission and the associated burden of HPV-related diseases.

Another key finding of this study was that older women (ages 18-30 and 31+) demonstrated an acceptable level of knowledge about the Pap test, likely due to increased awareness from life experiences or indirect exposure to information about cervical cancer. Although a small proportion of participants had undergone a Pap test, it is encouraging that 20.8% did so based on personal awareness, suggesting a hopeful trend for the future. Previous studies have found that women often experience feelings of shame and embarrassment, or a perception of not being at risk, which contributes to a generally negative attitude towards cervical cancer screening methods [41-43]. Additionally, previous research has shown that factors such as high poverty levels and the absence of free national screening services negatively impact women's attitudes toward screening methods [44].

5. RECOMMENDATIONS

To meet the WHO Cervical Cancer Elimination strategy's goal of achieving 90% immunization coverage among adolescent girls by 2030, targeted and effective interventions are essential to raise HPV awareness and vaccine acceptance [45]. These require a comprehensive strategy including education, healthcare provider engagement, supportive policies, and ongoing research. Healthcare providers should receive training and resources to effectively convey the importance of HPV vaccination to parents, address common questions, and manage vaccine hesitancy. Additionally, it is crucial to understand and mitigate socioeconomic barriers, including cultural beliefs, that hinder access to vaccines. Addressing these barriers may require community involvement, such as organizing workshops and seminars, and involving community leaders in awareness campaigns to foster trust and acceptance of the HPV vaccine.

Future research should focus on identifying and addressing specific factors related to HPV infection and vaccine knowledge, as well as implementing long-term research to monitor the impact of vaccination programs on HPV infection rates and cervical cancer incidence. These interventions can improve vaccination coverage and reduce the global burden of cervical cancer.

6. STUDY STRENGTHS AND LIMITATIONS

The recent implementation of an immunization program in Albania provided an opportunity to explore the multifaceted factors that could influence its success. The present study used a comprehensive questionnaire, which was carefully developed and pilot-tested to ensure clarity and relevance. Moreover, this study provides valuable insights across different age groups to better understand their familial roles in the decision-making process regarding the HPV vaccine.

However, this study has a few limitations. Firstly, the use of an online survey may have excluded individuals without internet access, potentially introducing bias by favoring more technologically skilled and urban participants. Secondly, self-reporting could introduce reporting biases, such as social desirability bias or inaccurate recall, which may have led to overreporting of positive behaviors or inaccuracies in participants' responses. Lastly, the cross-sectional design limits the ability to draw causal conclusions.

CONCLUSION

This study provides a timely and comprehensive overview of knowledge, attitudes, and practices related to HPV vaccination and cervical cancer screening among Albanian women. Knowledge about HPV vaccination varied significantly by age, educational background, marital status, and employment sector. Importantly, age, education level, and employment status emerged as predictors of willingness to receive the HPV vaccine. Although nearly half of the participants expressed a willingness to get vaccinated, the variation across demographic groups underscores the need for targeted public health and educational interventions.

Notably, the willingness to recommend the HPV vaccine was higher among urban residents, university students, and healthcare professionals, indicating the need for targeted educational campaigns aimed at less-informed subgroups, especially adolescents and rural populations. Although Pap smear awareness was widespread, the actual participation rate remained low, prompting a need to enhance both access to and motivation for cervical cancer screening. Overall, these findings highlight the need for specific and tailored public health interventions. Expanding community education, improving access to services, and engaging trusted healthcare professionals can play a critical role in improving HPV vaccine uptake and screening rates, ultimately contributing to the prevention of HPV-related diseases in Albania.

AUTHOR'S CONTRIBUTIONS

The authors confirm their contribution to the paper as follows: E.P.: Study conception and design; S.B.: Data analysis or interpretation; B.H.: Writing - original draft preparation;. All authors reviewed the results and approved the final version of the manuscript.

LIST OF ABBREVIATIONS

HPV	=	Human Papillomavirus
NIP	=	National Immunization Program
SPSS	=	Statistical Package for Social Sciences
WHO	=	World Health Organization
CIN-1	=	Cervical Intraepithelial Neoplasia grade 1 (minor dysplasia)
CIN-2	=	Cervical Intraepithelial Neoplasia grade 2 (moderate dysplasia)

CIN-3/CIS	=	Cervical Intraepithelial Neoplasia grade 3 (severe dysplasia or carcinoma *in situ*)
2vHPV	=	bivalent HPV Vaccine
4vHPV	=	quadrivalent HPV Vaccine
9vHPV	=	nonavalent HPV Vaccine
GACVS	=	Global Advisory Committee on Vaccine Safety
ACIP	=	Advisory Committee on Immunization Practices
SAGE	=	Strategic Advisory Group of Experts

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by the Ethics Committee of the Catholic University "Our Lady of Good Counsel" in Tirana, Albania (Prot. Nr. 630 of 16/12/2023).

HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or research committees and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants by ensuring that they were fully aware of the purpose of the study before agreeing to take part.

Parental consent was obtained for participants aged 15-17 years.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available in https://doi.org/10.5281/zenodo.15773760.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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