ORIGINAL ARTICLE

Assessing Knowledge of Cervical Cancer Screening and Human Papilloma Virus Prevention in Security Personnel and Their Families: A Cross-Sectional Study

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Article History:
Received date: April 15, 2026
Revised date: June 8, 2026
Accepted date: June 26, 2026
Published date: August 1, 2026

Online Access

DOI: 10.64772/mjapfn.2.2.59

Abstract

Introduction: Cervical cancer is a leading cause of cancer-related morbidity and mortality among women in Nepal, despite being preventable through early screening and Human Papilloma Virus vaccination. Limited evidence exists regarding knowledge of cervical cancer prevention among Armed Police Force personnel and their families. This study aimed to assess awareness and knowledge of cervical cancer, its risk factors, screening methods, and vaccination among this population.

Methods: This was a hospital based cross-sectional study conducted over a four-month period, from August 2025 to December 2025, after obtaining approval from the Institutional Review Committee (Reference number: NAPFH-026/2024). A structured, validated questionnaire was used to collect data on socio-demographic characteristics and knowledge of cervical cancer, screening methods, and vaccination. A convenience sample included 410 participants. Data were analyzed using the Statistical Package for the Social Sciences version 26.

Results: Among 410 participants, 315 (76.83%) had heard of cervical cancer, with media 189 (46.10%) being the most common source of information. Knowledge of cervical cancer risk factors and symptoms was variable, with multiple sexual partners, 157 (38.29%), and post-menstrual bleeding, 154 (37.56%), being the most frequently identified. Among them, 225 (54.87%) believed cervical cancer is preventable, and 222 (54.15%) identified regular screening as a key preventive method. Although 251 (61.22%) had heard of the vaccine, only 95 (23.17%) correctly identified the optimal timing for vaccination, and substantial misconceptions persisted regarding Human Papilloma Virus infection, vaccine availability, and the necessity of screening after vaccination.

Conclusions: While general awareness of cervical cancer was moderate, substantial knowledge gaps exist regarding Human Papilloma Virus related prevention and screening practices.

Keywords: *cervical cancer; Human Papilloma Virus; HPV vaccination.*

How to cite (Vancouver Style)
Karmacharya S, Khatri N, Maharjan R, Adhikari L, Khaural B, et.al. Assessing Knowledge of Cervical Cancer Screening and Human Papilloma Virus Prevention in Security Personnel and Their Families: A Cross-Sectional Study. Med J APF Nepal. 2026;2(2):15-21.

Introduction

Cervical cancer screening has reduced the incidence of cervical cancer.[1] It is the fourth most common cancer in women, with over 660,000 cases in 2022, and mortality is 18 times higher in low- and middle-income countries.[2,3] Nearly all cases are linked to, high-risk human papilloma virus (HPV) infection, mainly types 16 and 18.[4] In Nepal, it is the second most common cancer and a leading cause of cancer-related deaths among women.[5]

Cervical cancer prevention is categorized into primary, which focuses on HPV vaccination, secondary which includes Pap smears, visual inspection, and HPV testing and tertiary strategies which focus on treatment of precancerous lesions.[6,7] Despite the efforts of Government of Nepal current measures remain insufficient to achieve WHO's 2030 elimination targets.[8] Research on cervical cancer knowledge and screening in the Armed Police Force (APF) community is limited. Addressing this gap can improve screening through targeted awareness and better access to services.[9]

This study aimed to assess knowledge of cervical cancer screening and human papilloma virus prevention in security personnel and their families.

Methods

A descriptive cross-sectional study was conducted over a four-month period from August 2025 to December 2025 at Nepal APF Hospital, Balambu, Kathmandu, Nepal. Ethical clearance was obtained from the hospital's Institutional Review Committee (Reference number: NAPFH-026/2024). This study population included APF personnel and their accompanying family members attending the hospital. A convenient sampling technique was used, and the sample size was calculated using the following Cochran's formula:

$N = (Z^2 x\ p\ x\ q)/e^2$

$= (1.96)^2 \times 0.50 \times 0.50 / (0.05)^2 = 385$

The minimum required sample size calculated is 385.

After accounting for a 10% non-response rate, the final sample size was set at 410.

Where,

n= minimum required sample size

Z=1.96 at 95% confidence interval (CI)

P= prevalence taken as 50% (0.50) for maximum sample size calculation

q=1-p

e =error of margin=5% or 0.05.

The study examined demographic and socioeconomic variables such as age, gender, ethnic group, marital status, occupation, family income, and educational level as independent variables, while the level of knowledge related to cervical cancer and HPV vaccination was considered the dependent variable.

Pretesting was conducted with 10% of the sample (43 participants) at the National Cancer Hospital, Jawalakhel, Lalitpur, and these respondents were excluded from the final data collection. Necessary modifications to the questionnaire were made based on the pretest findings.

A structured and semi-structured questionnaire, developed through a literature review and expert consultation, was used as the data collection tool. Content validity was ensured through expert review by four specialists, resulting in a validity index of 0.93. The questionnaire was prepared in English, translated into Nepali, and back-translated into English to maintain linguistic accuracy. Reliability was assessed during the pretest, and internal consistency was measured using Cronbach's alpha.

The questionnaire consisted of two parts. Part I included seven questions on socio-demographic characteristics. Part II comprised 18 items assessing knowledge about cervical cancer, its risk factors, cervical cancer screening, and HPV vaccination. Most items had a single correct response, except for questions 3 and 7, which allowed multiple answers. Data were collected using self-administered Nepali questionnaires, and interviews were conducted for illiterate respondents.

All collected data were checked for completeness, coded, and entered into the Statistical Package for the Social Sciences version 26.0 for analysis. Descriptive statistics such as frequency, percentage, mean, median, and standard deviation were used for interpretation. No significant biases were anticipated; however, the use of self-reported responses might have introduced reporting bias toward socially desirable responses.

Results

Among 410 participants, the mean age was 29.63±6.65 years. The data indicate a diverse sample with a higher representation of females, married individuals, and respondents with higher secondary and university education, predominantly from the Hindu community. The socio-demographic characteristics are summarized in Table 1.

Table 1: Socio-demographic Status (n=410).

Variable	Category	n (%)
Age (mean ± SD)	(Mean ± SD	29.63±6.65
Gender	Male	167 (40.73)
	Female	239 (58.29)
	Other	4 (0.98)
Marital Status	Married	295 (71.95)
	Unmarried	115 (28.05)
Education Level	Primary	19 (4.63)
	Secondary	86 (20.98)
	Higher Secondary	171 (41.71)
	University Degree	133 (32.44)
	High School Equivalent	1 (0.24)
Occupation	Unemployed	32 (7.80)
	Housewife	65 (15.86)
	Student	80 (19.51)
	Others	233 (56.83)
Income Per Month (in Rs.)	Less than 20 thousand	18 (4.39)
	20-40 thousand	90 (21.95)
	40-60 thousand	213 (51.95)
	Above 60 thousand	89 (21.71)
Religion	Hindu	273 (66.58)
	Buddhist	51 (12.44)
	Muslim	12 (2.93)
	Christian	57 (13.90)
	Others	17 (4.15)

Awareness and Knowledge of Cervical Cancer

The general awareness of cervical cancer is relatively high, knowledge regarding specific risk factors and symptoms remains varied, indicating potential gaps in understanding and the need for enhanced health education efforts. The respondents' awareness and knowledge related to cervical cancer are shown in Table 2.

Table 2: Awareness and Knowledge of Cervical Cancer (n=410).

Variable	Response	n (%)
Heard about cervical cancer	Yes	315 (76.83)
	No	95 (23.17)
Source of information	Media	189 (46.10)
	Health Workers	104 (25.36)
	Friends	40 (9.76)
	Family	22 (5.37)
	Others	55 (13.41)
Knowledge of risk factors	Multiple sexual partners	157 (38.29)
	Early sexual activity & childbirth	139 (33.90)
	History of STIs	128 (31.22)
	HPV infection	105 (25.61)
	Smoking	49 (11.95)
	Age 30–35 years	64 (15.61)
	Long-term contraceptive pill use	61 (14.88)
Knowledge of symptoms	Post-menstrual bleeding	154 (37.56)
	Bleeding during sexual intercourse	141 (34.39)
	Bleeding between periods	132 (32.20)
	Foul-smelling discharge	98 (23.90)
	Don't know	62 (15.12)

Knowledge of Cervical Cancer Prevention and HPV Vaccine

Table 3 shows varying levels of knowledge and awareness regarding cervical cancer prevention and HPV-related information among respondents. Some respondents possess basic knowledge about cervical cancer prevention and HPV vaccination, significant misconceptions and knowledge gaps persist, particularly regarding vaccine timing, availability, and the need for continued screening after vaccination.

Table 3: Knowledge of Cervical Cancer Prevention and HPV Vaccine (n=410).

Variable	Response	n (%)
Can cervical cancer be prevented?	Yes	225 (54.87)
	No	59 (14.40)
	Don't know	126 (30.73)
Availability of cervical cancer vaccine	Available	157 (38.29)
	Not available	110 (26.83)
	Don't know	143 (34.88)
Methods of preventing cervical cancer	HPV vaccination	83 (20.24)
	Fewer sexual partners	134 (32.68)
	Regular screening	222 (54.15)
	Condom use	85 (20.73)
	Delayed marriage/ childbirth	66 (16.10)
	No smoking	52 (12.68)
	Timely treatment of genital infections	63 (15.37)
Heard about HPV vaccine	Yes	251 (61.22)
	No	159 (38.78)
Can HPV vaccine prevent cervical cancer?	Yes	231 (56.34)
	No	179 (43.66)
Availability of HPV vaccine in Nepal	Available	156 (38.05)
	Not available	254 (61.95)
Best time for HPV vaccine? (before sexual debut)	Yes	95 (23.17)
	No	95 (23.17)
	Don't know	220 (53.66)
Aware of benefits of regular cervical cancer screening?	Yes	218 (53.17)
	No	192 (46.83)
Need for screening even after HPV vaccine?	Yes	192 (46.83)
	No	64 (15.61)
	Don't know	154 (37.56)
Is HPV related to cervical cancer?	Yes	139 (33.90)
	No	96 (23.41)
	Don't know	175 (42.69)
Can men be infected with HPV?	Yes	76 (18.54)
	No	140 (34.15)
	Don't know	194 (47.31)
Can HPV infection cure itself?	Yes	23 (5.61)
	No	4 (0.97)
	Not sure	207 (50.49)
	Don't know	176 (42.93)
Is HPV infection common?	Yes	17 (4.15)
	No	198 (48.29)
	Don't know	195 (47.56)
WHO-recommended cervical cancer screening method	VIA	58 (14.15)
	Pap smear	113 (27.56)
	HPV DNA testing	68 (16.58)
	Colposcopy	18 (4.39)
	None of the above	30 (7.32)
	Don't know	123 (30.00)

Discussion

The findings from this study reveal that awareness and knowledge of cervical cancer and its prevention among respondents were moderate but show significant gaps, aligning with patterns observed in other settings, particularly in low- and middle-income countries. In this study, 315 (76.83%) of participants had heard of cervical cancer, indicating a relatively higher awareness compared to some earlier Nepali community-based research. In a similar hospital-based study conducted at a tertiary care center in Kathmandu, only 32.28% had heard about cervical cancer.[10] Similarly, a population-based study in two Nepali communities reported only 53.30% awareness of cervical cancer, with notable differences between rural and more urban settings.[11]

The media and health workers being the predominant sources of information in this study mirror findings in previous research where television, radio, and interpersonal communication played substantial roles in disseminating health information.[12] Studies globally emphasize that mass media exposure significantly influences awareness of cervical cancer and preventive practices. This suggests

that multipronged communication strategies remain crucial for increasing knowledge in similar populations.

Regarding knowledge of risk factors, multiple sexual partners, early sexual contact, and history of sexually transmitted infections were frequently recognized in this study. This is similar to findings from cross-sectional research in China indicating that awareness of sexual behavior-related risk factors tends to be higher than recognition of non-sexual factors such as smoking and long-term contraceptive use.[13] However, the respondents demonstrated limited recognition of some established risk factors like HPV infection (25.60%) echoing the broader pattern of insufficient risk factor comprehension documented in South Asian settings.[11]

Awareness of HPV vaccination and its role in prevention in this study with 61.22% having heard of the vaccine and only 56.34% recognizing its preventive effect was markedly better than some earlier Nepali studies that reported extremely low knowledge of HPV and HPV vaccines. In a similar previous study 91.60% did not know about its vaccine and its availability.[14] Nevertheless, the substantial proportion of respondents who were unsure about vaccine effectiveness and availability suggests persistent gaps that have also been noted in other low-resource settings. For example, studies in Nepal and other South Asian regions found low awareness and misunderstanding about HPV vaccination, with knowledge ranging widely but often remaining low relative to high-income countries.[14]

Knowledge regarding screening methods and appropriate timing for HPV vaccination was also limited. The finding that only a minority of respondents could identify Pap smear, VIA, or HPV DNA testing as screening tools parallels evidence from other Nepali and international studies showing low recognition of specific screening modalities and preventive practices. For example, research in Kampala and urban Nepal among women attending healthcare facilities reported that 53% of women were unaware of screening tests.[15] Additionally, the uncertainty about the necessity of screening even after vaccination reflected knowledge gaps observed in comparable populations, where understanding of comprehensive preventive care remains incomplete.

The mixed perceptions about HPV's natural history, men's susceptibility to HPV, and the commonness of HPV infection underscore deep knowledge deficits. This pattern is consistent with global reports from both high- and low-income contexts, where broader understanding of HPV beyond its role in cervical cancer is often poor, affecting preventive behavior uptake including vaccination and screening.[13]

Overall, the findings indicate that although general awareness of cervical cancer among the study population was moderately high, knowledge regarding specific preventive measures, risk factors, and HPV-related information was limited. These results are consistent with previous studies conducted in Nepal and other international settings, highlighting persistent gaps in understanding cervical cancer prevention.[14] The data underscore the necessity for targeted health education interventions and enhanced public health strategies to improve knowledge of HPV, vaccination timing, and cervical cancer screening practices, with approaches adapted to the local cultural context and healthcare accessibility.

The study had limitations, including limited generalizability beyond APF personnel and their families, the potential for self-reporting bias, and the exclusion of individuals unable to understand Nepali, which may have reduced sample diversity. Moreover, methodological limitations restricted the derivation of specific analytical parameters, thereby preventing the identification of statistically significant associations.

Limited knowledge about the effectiveness and timing of HPV vaccination, as well as misconceptions regarding screening guidelines, a need for intensified health education and awareness programs. Targeted interventions focusing on HPV-related information, routine screening, and culturally appropriate educational strategies are essential to enhance cervical cancer prevention and promote informed healthcare practices among the population. Hence, appropriate education and counselling should be provided through structured awareness programs, leveraging both national and international efforts to improve knowledge and preventive behaviors.

Conclusions

The study demonstrates that while a majority of respondents were generally aware of cervical cancer, substantial gaps exist in their understanding of risk factors, preventive measures, HPV infection, vaccination, and screening practices.

Source of Funding: None

Acknowledgement: None

Conflict of Interest:

The authors declare no competing interests. Dr Rajendra Maharjan is currently serving as Editor of Medical Journal of Armed Police Force Nepal (MJAPFN). He was not involved in the editorial review or decision making for this manuscript.

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