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Original Research Article

Awareness and perception of human papillomavirus and HPV vaccination and its program among reproductive-aged women in Taunggyi Township, Southern Shan State: a cross-sectional study with mixed-methods

Yin Yin Htwe[1]*, Aung Kyaw Soe[2]

[1]University of Community Health, Magway, Myanmar
[2]State Public Health Department, Lashio, Northern Shan State, Myanmar

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***Correspondence:**
Yin Yin Htwe,
E-mail: yinyinhtwe93.yyh@gmail.com

ABSTRACT

Background: In Myanmar, cervical cancer is the second leading cause of cancer-related deaths among women. The effective prevention strategies are human papillomavirus (HPV) vaccination and screening programs. This study aimed to identify awareness and perception of HPV and HPV vaccination, and its program among reproductive-aged women.

Methods: A cross-sectional study with mixed-methods was conducted at Taunggyi Township, Southern Shan State. About 340 reproductive-aged women from rural and urban areas were face-to-face interviewed. Two FGDs were conducted in selected areas.

Results: Most respondents (322, 94.7%) heard of HPV, but knowledge of HPV infection, and its preventive measures were very low. Perception of HPV infection and its vaccination was good. The primary source of information about HPV and its vaccine was healthcare providers (70%), social media (14%) and teachers (8%). Common barriers to HPV vaccination were cost and lack of information. Respondents' residence (p=0.018, 95% CI=0.06-0.08) and income (p=0.003, 95% CI=1.47-92.0) were the associated factors of knowledge of HPV, while education status (p=0.004, 95% CI=1.39-6.45) and own HPV vaccination status (p=0.031, 95% CI=1.07-1.16) were significantly associated with perception of HPV. Only respondents' income was statistically significant with knowledge of HPV vaccination (p=0.001, 95% CI=1.03-1.11). As a result of thematic analysis, the overall information towards HPV vaccination program was satisfactory, despite the knowledge gap.

Conclusions: This study indicated the need for targeted public health interventions that address knowledge gaps, enhance the opportunity for the role of healthcare providers and teachers and promote the HPV vaccination program by increasing accessibility and fostering community engagement.

Keywords: Awareness, Human papillomavirus, Perception, Vaccination

INTRODUCTION

Cervical cancer is ranked as fourth in the most frequent cancers among women in the world.[1] The Ministry of Health, Myanmar first introduced HPV vaccine in Expanded Program on Immunization (EPI) program since 2020.[2] According to the Catalan Institute of Oncology and the International Agency for Research on Cancer, women of 20.6 million population aged 15 years and older in Myanmar are at risk of developing cervical cancer. About 4,497 cervical cancer deaths occur annually in Myanmar are diagnosed annually (estimations for 2020). Cervical cancer ranks as the first leading cause of cancer deaths of female cancer deaths in Myanmar and

the main cause of cancer deaths in women aged 15 to 44 years in Myanmar.[3]

The main cause of cervical cancer is due to an infection of human papillomavirus. Out of various cancers, cervical cancer is one of vaccine preventable cancers. The preventive measures against cervical cancer are HPV vaccination and screening program. There is still a limitation to access these preventive measures in low-and middle-income countries.[1] According to World Health Assembly (WHA 73.2), the global strategy is to reach an elimination of cervical cancer (less than 4 cases per 100,000 per women per year). WHO has set up the 90-70-90 targets by 2030: 90% of girls fully vaccinated with HPV vaccine by age 15, 70% of women who are screened with a high-performance test by 35, and again by 45 years of age and receiving treatment for 90% of women identified with cervical disease. WHO works with countries and partners to develop and implement comprehensive programme in line with global strategy. Being a member country for United Nations Global Joint Program (UNGJP), Myanmar designed the three pillars of cervical cancer prevention: primary, secondary and tertiary preventions.[1]

The Ministry of Health, Myanmar first introduced HPV vaccine in Expanded Program on Immunization (EPI) program since 2020. More than 90% of 9-year-old girls got their first dose of HPV vaccine in a community-based strategy. Due to the COVID-19 pandemic, HPV vaccination program could not be put in routine EPI programme. In late 2023, EPI program launched HPV vaccination as the 13th vaccine in routine EPI programme.[2] Therefore, the awareness on HPV and HPV vaccination among reproductive-aged women is crucial to improve the high coverage of HPV vaccination. Also, their perception to HPV vaccination should be identified to overcome the challenges on this program. The achievement of these programs depends on the knowledge and perception of reproductive-aged women.[3]

According to the Myanmar Demographic and Health Survey (2015-2016), Shan State indicates the information about the female literacy rate (61%, lowest in states/regions), proportion of married women who have one or more co-wives (9%, highest in states/regions), age at marriage (20.4, earliest age at marriage in states/regions) and median age at first sex (20.6, earliest in states/regions).[4] Therefore, this study identified the information about the awareness on HPV and HPV vaccination and its program among reproductive-aged women. Moreover, the findings support the indication as regarding to improve the better HPV vaccination program in Southern Shan State and Myanmar.

METHODS

A cross-sectional study with mixed-methods was used. Women of reproductive-aged from rural and urban area of Taunggyi Township, Southern Shan State was selected as a study population for both approaches from January 2024 to June 2024. A total of 340 women of reproductive-aged were selected as study participants and face-to-face interviewed with a pretested structured questionnaire. Two focus group discussions (FGD) were conducted in rural and urban areas. A total of 250 reproductive-aged women from rural areas and 110 women from urban areas were proportionately recruited and interviewed in face-to-face manner using a pre-tested structured questionnaire.

One FGD from each area was carried out in Taunggyi township. Two focus group discussions were conducted with participants who were involved in the quantitative approach. About 10 participants for each group were recruited based on their educational background and marital status (i.e., married women with passed middle school level). Data entry and cleaning process will be done by using excel. The exploration and analysis of data was done using SPSS 16.0 version software. Bivariate analysis was performed to be considered as statistically significance. For qualitative approach, thematic analysis was carried out by using topics in interview guidelines.

Ethical approval was submitted to University of Community Health (UCH)- institutional review board (UCH-IRB), Magway.

RESULTS

Quantitative results

Socio-demographic characteristics

About 240 (70%) women from rural areas and 100 (30%) from urban areas of Taunggyi township were selected as study participants. More than half of women (223, 65.6%) were young, aged group (18-35) years old. Half of respondents (179, 52.6%) were Pa Oah ethnicity, followed by Bamar (65, 19.1%), Inn (48, 14.1%) and Shan (32, 9.4%). A large proportion (216, 63.5%) were married. Nearly half of respondents (142, 41.8%) had their own business which aligns with about (132, 38.9%) were housewives and students who indicated a lack of paid employment. A large proportion (137, 40.3%) had received middle education, with only (55, 16.2%) having received a tertiary education. Half of respondents (50%) were in the low-income group. The highest number of respondents (144, 61%) had 1-2 children, with another significant portion (64, 27.1%) having 3 or more children. Only (41, 12.1%) respondents had received the HPV vaccination. Among respondents who had 9-10 years old daughters, a large portion (71, 64.5%) hadn't received HPV vaccination, followed by completed (30, 27.3%), and not completed (9, 8.2%). Most of respondents had willing to receive HPV vaccination for their child.

Table 1 shows the bivariate analysis of socio-demographic factors and knowledge of HPV infection. The associated factors with knowledge of HPV infection

were current residence (p=0.018, 95%CI =0.06-0.08) and respondent's monthly income (p=0.003, 95% CI =1.47-92.0). Table 2 demonstrates that education status (p=0.004, 95% CI =1.39-6.45) and HPV vaccination status (p=0.031, 1.07-1.16) were associated factors of perception of HPV infection among reproductive-aged. Table 3 is showing concerned with HPV vaccination, only respondent's monthly income was the associated factor of knowledge on HPV vaccination with being p value of 0.001 with 1.03, 1.11 of 95%CI.

Table 1: Relationship between socio-demographic characteristics and knowledge on HPV infection among reproductive-aged women in Taunggyi Township, southern Shan State.

Variables	Knowledge level		P value	95% CI
	Low	High		
Current residence				
Rural	236 (98.3)	4 (1.7)	0.018	0.06, 0.08
Urban	93 (93.0)	7 (7.0)		
Age group (years)				
18-35 years	214 (96.0)	9 (4.0)	0.343	0.09, 1.95
36-49 years	115 (98.3)	2 (1.7)		
Ethnicity				
Shan	262 (97.4)	7 (2.6)	0.251	0.64, 7.86
Others	67 (94.4)	4 (5.6)		
Marital status				
Married	227 (97.4)	6 (2.6)	0.332	0.55, 6.22
Not married	102 (95.3)	5 (4.7)		
Main occupation				
Unemployed	131 (99.2)	1 (0.8)	0.056	0.84, 52.3
Employment	198 (95.2)	10 (4.8)		
Education status				
Low education level	73 (100.0)	0 (0.0)	0.130	1.02, 1.07
Middle and High education level	256 (95.9)	11 (4.1)		
Respondent's monthly income				
<150,000	177 (99.4)	1 (0.6)	0.003	1.47, 92.0
≥150,000	152 (93.8)	10 (6.2)		
Number of children (if married woman)				
No child	139 (96.5)	5 (3.5)	0.669	0.05, 3.86
Having child	63 (98.4)	1 (1.6)		
Own HPV vaccination status				
Vaccinated	39 (95.1)	2 (4.9)	0.629	0.13, 2.90
Not vaccinated	290 (97.0)	9 (3.0)		
Child's HPV vaccination status				
Vaccinated	37 (94.9)	2 (5.1)	0.614	0.07, 3.96
Never vaccinated	69 (97.2)	2 (2.8)		
Willing to receive HPV vaccination to your child				
Willing to vaccinate	61 (98.4)	1 (1.6)	0.402	0.21, 60.40
Not will and no decision	17 (94.4)	1 (5.6)		

Awareness of HPV infection

A huge significant portion (322, 94.7%) have heard of HPV. The main source of information about HPV was healthcare providers (197, 61.2%), followed by social media (40, 12.4%), friends (30, 9.3%), teachers (26, 8.1%), and family members (18, 5.6%). Only a small portion (99, 30.7%) knew that viruses are the causal agent of HPV infection. Regarding diseases caused by HPV infection, half of the respondents (137, 53.1%) answered cervical cancer, followed by vaginal cancer (93, 36%), vulva cancer (74, 28.7%), genital warts (30, 11.6%), and anal cancer (25, 9.7%). More than half of the respondents (131, 68.6%) mentioned that the route of transmission of HPV infection was sexual contact. The common answers related to signs and symptoms of HPV infections were abnormal vaginal bleeding (52%), cervical discharge (40%), painful sex and urination (18%), no symptoms (15%), and genital warts (12%). The correct diagnostic test for HPV infection (Pap smear) was answered by

(106, 61%) respondents. The most answers for treatment of HPV infection were chemotherapy (62.4%), antibiotics (32.6%), no treatment for virus (13%), and removal of the uterus (6.2%). A most significant portion of the respondents (172, 81%) knew that HPV infection can be prevented by vaccination, followed by condom use (24.4%), and avoiding direct contact (4.7%). The overall knowledge level among respondents was 96.8% at low knowledge level and only 3.2% had high knowledge of HPV infection.

Table 2: Relationship between socio-demographic characteristics and perception to HPV infection among reproductive-aged women in Taunggyi township, southern Shan state.

Variables	Perception level		P value	95% CI
	Poor	Good		
Current residence				
Urban	9 (9.0)	91 (91.0)	0.961	0.44, 2.21
Rural	22 (9.2)	218 (90.8)		
Age group (years)				
18-35	18 (8.1)	205 (91.9)	0.355	0.33, 1.49
36-49	13 (11.1)	104 (88.9)		
Ethnicity				
Shan	28 (10.4)	241 (89.6)	0.107	0.78, 8.93
Others	3 (4.2)	68 (95.8)		
Marital status				
Married	21 (9.0)	212 (91.0)	0.921	0.44, 2.12
Not married	10 (9.3)	97 (90.7)		
Main occupation				
Unemployed	10 (7.6)	122 (92.4)	0.431	0.33, 1.60
Employment	21 (10.1)	187 (89.9)		
Education status				
Low education level	13 (17.8)	60 (82.2)	0.004	1.39. 6.45
Middle and high education level	18 (6.7)	249 (93.3)		
Respondent's monthly income				
<150,000	16 (9.0)	162 (91.0)	0.931	0.46, 2.03
≥150,000	15 (9.3)	147 (90.7)		
Number of children (if married woman)				
No child	16 (11.1)	128 (88.9)	0.138	0.71, 9.05
Having child	3 (4.7)	61 (95.3)		
Own HPV vaccination status				
Vaccinate	0 (0.0)	41 (100.0)	0.031	1.07, 1.16
Not vaccinate	31 (10.4)	268 (89.6)		
Child's HPV vaccination status				
Vaccinated	0 (0.0)	39 (100.0)	0.087	1.02, 1.17
Not vaccinated	6 (8.5)	65 (91.5)		
Willing to receive HPV vaccination to your child				
Willing to vaccinate	4 (6.5)	58 (93.5)	0.612	0.09, 3.29
Not will and no decision	2 (11.1)	16 (88.9)		
Knowledge level on HPV infection				
Low knowledge	31 (9.4)	298 (90.6)	0.608	0.88, 0.94
High knowledge	0 (0.0)	11 (100.0)		

Perception of HPV infection

Figure 1 indicates the perception of HPV infection among reproductive-aged women in Taunggyi township. The overall perception level of HPV was good (91%).

Awareness and knowledge about HPV vaccination

Among 322 respondents who had heard of HPV, 305 (94.7%) knew about HPV vaccination. Regarding the eligible ages of women for effective HPV vaccination, 234, 78.6% answered 9-15 years, whereas (51, 17.1%)

responded above 15 years is most suitable for that. The common answers to the question "How many doses are required to complete HPV vaccination" were 2 doses (33.1%), followed by 1 dose (31.5%), 3 doses (19.3%), and 5 doses (1.3%). A significant portion (79.3%) knew of the HPV vaccination program in Myanmar. The primary information about this program was healthcare providers (70%), social media (14%), pamphlets/posters (7%), and friends (5.4%). Most respondents (76.3%) mentioned the right targeted age group (9-10 years) for the HPV vaccination program in Myanmar. Nearly half of the respondents (45.6%) knew the side effects of HPV vaccination. The common side effects that they answered were swelling or pain at the injection site (62%), dizziness (39%), feeling sick (32.4%), headache (19.4%), and aching body (10%). Half of respondents (57%) thought that an additional pap smear should be required for vaccinated women for their lifetime. Most of respondents (97%) had low knowledge of HPV vaccination.

Perception of HPV vaccination

Figure 2 mentions the perception of HPV vaccination among reproductive-aged women in Taunggyi township. The good perception of HPV vaccination was 88.5%.

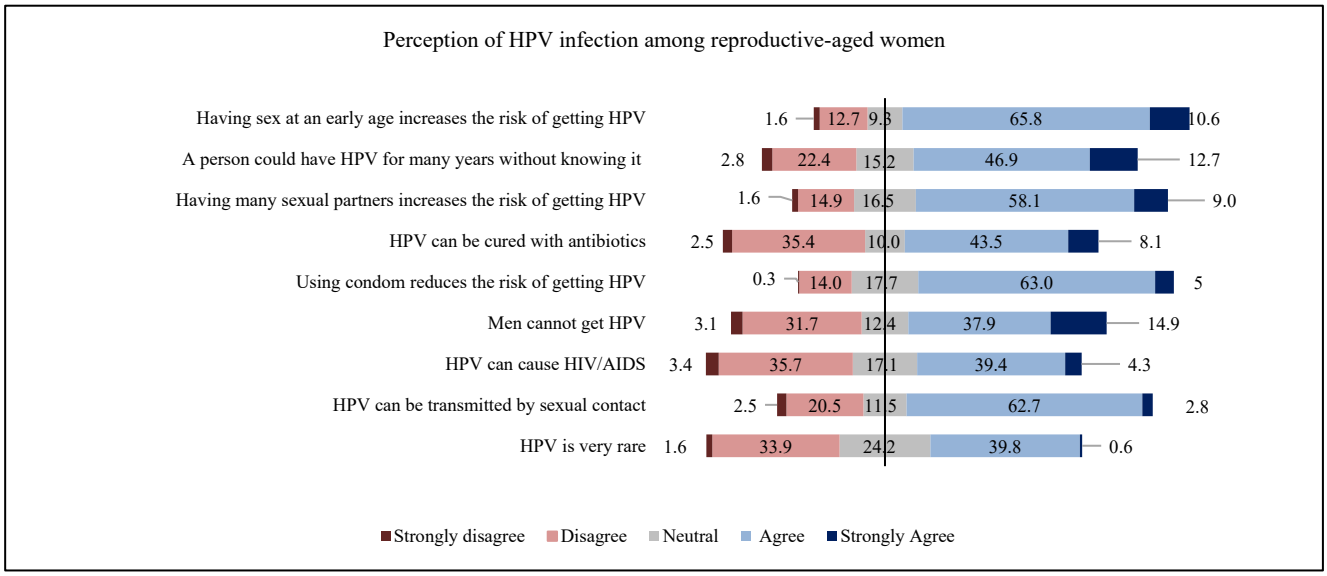

Figure 1: Perception of HPV infection among reproductive-aged women in Taunggyi township, southern Shan State.

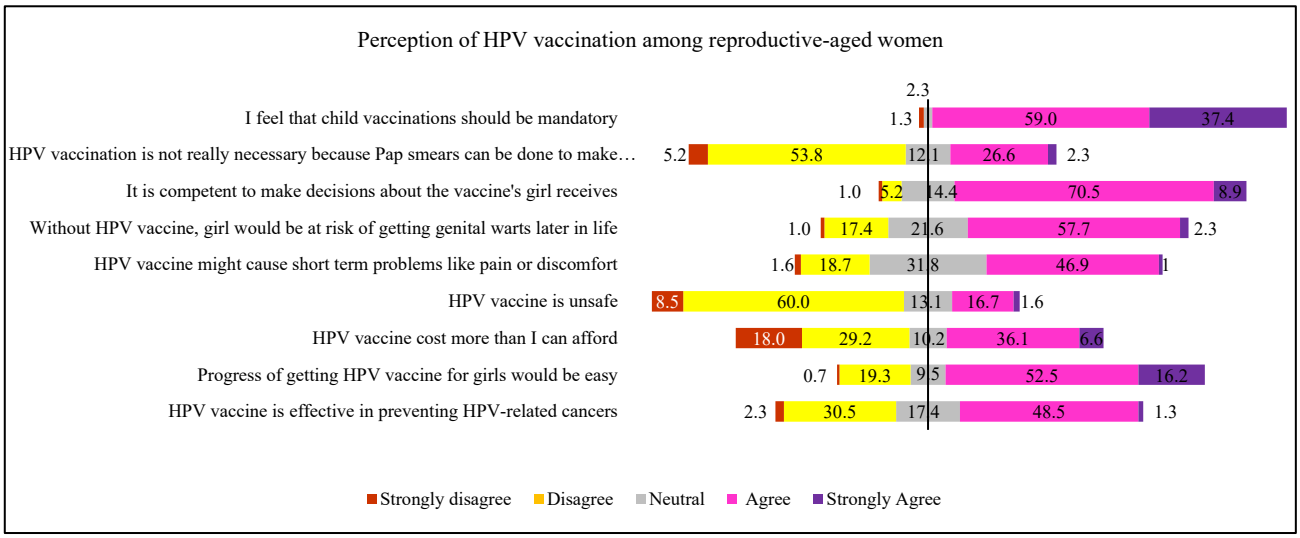

Figure 2: Perception of HPV vaccination among reproductive-aged women in Taunggyi township, southern Shan State.

Table 3: Relationship between socio-demographic characteristics and knowledge on HPV vaccination among reproductive-aged women in Taunggyi Township, Southern Shan State.

Variables	Knowledge level		P value	95% CI
	Low	High		
Current residence				
Urban	99 (99.0)	1 (1.0)	0.292	0.48, 30.85
Rural	231 (93.3)	9 (3.8)		
Age group (years)				
18-35	215 (96.4)	8 (3.6)	0.504	0.10, 2.24
36-49	115 (98.3)	2 (1.7)		
Ethnicity				
Shan	262 (97.4)	7 (2.6)	0.441	0.42, 6.55
Others	68 (95.8)	3 (4.2)		
Marital status				
Married	229 (98.3)	4 (1.7)	0.078	0.94, 12.31
Not Married	101 (94.4)	6 (5.6)		
Main occupation				
Unemployed	131 (99.2)	1 (0.8)	0.096	0.74, 47.32
Employed	199 (95.7)	9 (4.3)		
Education status				
Low education level	72 (98.6)	1 (1.4)	0.696	0.31, 20.15
Middle and high education level	258 (96.6)	9 (3.4)		
Respondent's monthly income				
<150,000	178 (100.0)	0 (0.0)	0.001	1.03, 1.11
≥150,000	152 (93.8)	10 (6.2)		
Number of children (if married woman)				
No child	141 (97.9)	3 (2.1)	0.554	0.96, 1.00
Having child	64 (100.0)	0 (0.0)		
Own HPV vaccination status				
Vaccinate	40 (97.6)	1 (2.4)	1.000	0.15, 10.06
Not vaccinate	290 (97.0)	9 (3.0)		
Child's HPV vaccination status				
Vaccinated	39 (100.0)	0 (0.0)	1.000	0.94, 1.04
Not vaccinated	70 (98.6)	1 (1.4)		
Willing to receive HPV vaccination to your child				
Willing to vaccinate	61 (98.4)	1 (1.6)	1.000	0.95, 1.02
Not will and no decision	18 (100.0)	0 (0.0)		

Qualitative results

Respondents' knowledge about HPV vaccination program

During FGD in the selected quarter in urban areas, all the respondents stated that they got the information about HPV vaccination from healthcare providers and teachers. Majority of them (6 out of 10) mentioned that social media were also a source of information for them whereas very few (2 out of 10) respondents said that they attained the information from teachers. Regarding the eligible age group for HPV vaccination, a few respondents (3 out of 10) mentioned girls under 15 years were eligible to get vaccination, whereas another three responded girls who aged 9 years to 10 years were the recommended age group. About 3 out of 10 mentioned that 11 years to 12 years old were another eligible age group. Only one respondent said that eligible age for HPV vaccination was 8 years old. Half of respondents (5 out of 10) stated that two doses were required to complete the vaccination, and another half did 1 dose.

On the other hand, during FGD at a selected village in rural area, majority of the respondents (8 out of 10) stated that they received information about HPV vaccination from healthcare providers. Only a few respondents (2 out of 10) did not get any information about HPV vaccination. Concerned with eligible age group for HPV vaccination, many respondents (4 out of 10) mentioned girls under 15 years were eligible to get vaccination, whereas another three responded that girls who aged 10 years to 12 years were the recommended age group. Only one respondent said that eligible age for HPV vaccination was 9 years to 10 years age group. A few respondents (3 out of 10) mentioned that only a single dose was required

to complete the vaccination, whereas half of respondents answered two doses were needed.

"Teachers say they will give vaccinations at school. They said that the younger class would be given first."(36-year-old, urban area)

"I found out about vaccinations because the village clinic teacher told me."(32-year-old, rural area)

Possible enablers getting to HPV vaccination

All respondents from urban area said that accessibility to information was very easy, and they got the information from teachers, healthcare providers, and social media. These were crucial enablers for vaccination. For rural area, most respondents (8 out of 10) stated that healthcare providers and teachers were the primary sources of information about vaccination, whereas a few respondents (2 out of 10) replied that they had no enablers getting to HPV vaccination.

"Since cervical cancer is common these days, if you give you the vaccine, there will be no more cases of the disease. There are good things like that." (28-year-old, urban area)

"If you buy the vaccine from outside, it will cost you money, so the health department is giving it, so it's cheaper."(25-year-old, rural area)

Possible barriers getting to HPV vaccination

Most respondents (6 out of 10) from urban areas mentioned that they had no barriers getting to HPV vaccination and got completed doses for their daughters. A few respondents (3 out of 10) stated that age ineligibility and transportation issues were the main barriers getting to vaccination.

A few respondents (3 out of 10) from rural area had barriers to getting vaccination due to age restrictions, while some participants (5 out of 10) faced transportation problems in accessing vaccination centers.

"When the health department came to collect the list, my daughter was not yet 11 years old. Only (2) months to turn (11) years old, that's why I didn't take the vaccine."(39-year-old, urban area)

"It is difficult to vaccinate in such village areas that are far from hospitals. In addition, adults like my father, sometimes, there are people who don't like getting vaccinated. I have to explain to understand."(28-year-old, rural area)

Suggestions to improve HPV vaccination program

All respondents from urban areas suggested that health education sessions points to an ongoing need for structured, comprehensive information on HPV vaccination. Furthermore, implementing or enhancing school-based vaccination programs could address many of the access-related barriers, especially for younger individuals who face difficulties reaching community-based centers.

"Worth? offices about vaccination, it would be more convenient if women's leaders were asked to speak through it."(25-year-old, urban area)

"It would be better to organize a group of teenagers in the neighborhoods and do a small educational program about vaccines."(36-year-old, urban area)

"I think it would be more convenient if every school teacher was asked to educate about vaccines."(32-year-old, urban area)

"There are some parents who don't want to come to the clinic. Because they are inconvenient to travelling school opening time I think it would be better if vaccinations were given in schools."(35-year-old, rural area)

"Village areas do not know much about vaccines. There are people who don't want to do it, parents, it would be better if we held educational lectures."(35-year-old, rural area).

DISCUSSION

The overall knowledge about the virus and its connection to cervical cancer remains limited, with many participants unable to correctly identify the types of cancers linked to HPV or their method of transmission. Moreover, the overall attitude towards HPV and its vaccine was good in this study. This finding was consistent with previous research that had shown gaps in HPV knowledge across different populations. Similarly, a study in Nigeria revealed that the majority of participants had poor knowledge about HPV and its vaccine.

However, they had a positive attitude towards the uptake of the HPV vaccine, but different from a study conducted in the black belt region of Alabama, found that slightly awareness on HPV and vaccine was among Africans Americans.[5,6] Marital status was another socio-demographic variable found to influence HPV knowledge, with unmarried individuals demonstrating higher awareness of HPV and the vaccine. This could be linked to the fact that HPV vaccination programs often target those at a younger age, before the onset of sexual activity. Interventions should, therefore, target not only young people but also adults who may not immediately recognize their vulnerability to HPV-related cancers. Moreover, this study found that individuals with higher levels of education were more likely to have accurate knowledge about HPV and its vaccine. Education plays a crucial role in shaping health literacy, and thus, targeted interventions are necessary to improve HPV-related

knowledge among less educated populations. This finding was similar to a study conducted in Thailand.[7]

According to qualitative findings, significant barriers to HPV vaccination identified in this study were the age limitation and transportation problems. In addition, socio-cultural beliefs and misconceptions about the HPV vaccine contributed to reluctance among certain segments of the population. Participants in our study, particularly from more conservative or rural areas, expressed concerns about the vaccine, reflecting a broader cultural misunderstanding of HPV and its association with sexual health. Similar concerns have been observed in other studies, such as one conducted in Nigeria, where socio-cultural factors and stigma around sexual health played a role in preventing women from seeking HPV vaccination.[8] Health education campaigns should therefore address these misconceptions by emphasizing that the vaccine is a preventive measure against cancer and is not linked to promoting sexual behaviour. Moreover, integrating HPV vaccination into school-based health programs may increase uptake, as adolescents are more likely to receive vaccines when offered within the context of routine immunization schedules. This was similar to a study conducted in Singapore, proposing school-based national vaccination programme was one of the recommendations to increase the rate of uptake of HPV vaccination in Singapore.[9]

There are some limitations of the study. The sample had a higher proportion of rural residents compared to urban dwellers, which may be biased results. Residents in studied areas consist of different ethnic groups; some participants may face a language barrier, potentially affecting data accuracy.

CONCLUSION

In conclusion, the findings from this study provide the need for targeted public health interventions that address knowledge gaps, correct misconceptions, and promote HPV vaccination among different socio-demographic groups. By enhancing education and healthcare provider engagement, particularly in underserved communities, it is possible to increase HPV vaccine uptake and reduce the burden of HPV-related cancers. Future research should focus on the development and evaluation of community-specific interventions that consider cultural, educational, and socio-economic factors influencing vaccine perceptions.

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