Original Research Article

Human Papilloma Virus (HPV) Infection and Vaccination: Knowledge, Attitudes and Practices among Young Adults Attending Universities in Cameroon

ABSTRACT

Aims: This study was initiated to assess the knowledge of human papilloma virus (HPV) infection and vaccination, attitudes towards HPV vaccines, as well as risky sexual practices of young university students towards HPV infection.
Study design: This was a cross-sectional descriptive study that included university-going young adults of both sexes, aged 18 to 25 years.
Place and Duration of Study: The study was conducted in four randomly selected state universities, located in different geographic regions of Cameroon. The study took place between April and July 2022.
Methodology: The survey instrument was a self-administered anonymous questionnaire. Participants were randomly given questionnaires to be completed. Data was imported into SPSS version 23 software for analyses. Participants were categorized into one of two groups - poor level of knowledge and good level of knowledge, depending on the number of correct answers to 7 questions about knowledge of HPV infection and vaccination. Chi-square test and logistic regression were used to examine differences in parameters.
Results: 1263 questionnaires were returned. Most participants (78.9%) were undergraduates aged 20 - 21 years (32.7%). Overall, just 87/1263 (6.9%) of participants had a good knowledge of HPV infection and vaccination, most of whom were females (56.7%). Educational level (OR 3.11, 95% CI (1.24 – 7.85), P = .02), field of study (OR 0.42, 95% CI (0.17 – 1.04), P = .04) and plans to become vaccinated (OR 0.33, 95% CI (0.14 – 0.76), P = .009) were predictors of good knowledge of HPV. Attitudes towards HPV vaccination were overall positive. 71.9% participants were sexually active, most of whom only used condoms sometimes (47.2%).
Conclusion: These findings underscore the need for educational programs and public health policies targeted to this age bracket, to increase students' awareness of the risks associated with HPV infection as this can potentially increase the vaccination rate in the country.

Keywords: Human papilloma virus, HPV vaccination, Knowledge, Sexual Health, Young Adults

1. INTRODUCTION

The human papilloma virus~~papillomavirus~~ (HPV) is a non-enveloped DNA virus which mainly spreads by direct contact, sexual and perinatal routes as well as through contaminated fomites [1]. HPV reportedly is a very common sexually transmitted infection (STI), with at

Comment [1]:

least one HPV type commonly detected in roughly 50–80% of females who are sexually active at some point in their lives [2, 3]. Women aged 20–24 years reportedly have the highest HPV prevalence rates globally, and infection with this virus typically occurs within 5–10 years of the very first sexual encounter [4, 5]. Individual and group sexual behaviors~~behaviours~~ have been associated with HPV transmission as key factors [6]. Other factors which have been associated with HPV transmission include the age at sexual debut, the number and characteristics of sex partners, and the diversity of sexual networks [7].

Although 90% of HPV infections do resolve by themselves within two years, HPV may sometimes persist to cause serious health problems. These include genital warts, cervical cancer, recurrent respiratory papillomatosis, as well as other less common but serious cancers like those of the vulva, vagina, penis, or anus, not leaving out oropharyngeal cancers [1]. Globally, cervical cancer remains a very common cancer especially amongst women, killing over 250,000 women worldwide every year. Most of the disease burden and cancer-related deaths have been reported in developing countries [8, 9]. HPV types 16 and 18 have been strongly associated with about 70% of cervical cancers [10]. Further indications reveal that this virus also contributes to the development of the other cancers in both genders [11].

Infection with HPV is preventable today with three globally available HPV vaccines. Regardless of its availability and benefits, the coverage for HPV vaccination is reportedly still low in many settings [12, 13]. Factors like poor health promotion and prevention schemes, as well as challenges in sensitizing young adults have been shown to contribute to this low vaccine coverage observed [14 - 16]. To prevent HPV-related cancers, the US Centers for Disease Control and Prevention [17], suggests that 11- to 12-year-olds receive two doses of the HPV vaccine, meanwhile catch-up doses are recommended for males and females up to 26 years of age for proper vaccination. Knowledge of HPV is strongly associated to acceptance of its vaccine [18]. Prevention of HPV has been shown to be hampered by poor coordination of vaccination plans and educational policies by health experts [14]. The HPV vaccine was first introduced in Cameroon by the Cameroon Baptist Convention Health Board in 2009. Two doses spaced six months apart are usually given to persons (mostly females) aged nine through twenty-five years.

Comment [2]: Why are the research targets or respondents the university students? Even though more than 71% of respondents are sexually active?

Several risk factors for infection with HPV have been reported in young adults (persons aged 15 to 24 years old) including an early commencement of sexual activities, having various sex partners, and high HIV prevalence rates [19]. Genital HPV infection has previously been observed in University students - a part of the young adult population, and this was associated with their risky sexual behaviours, very poor knowledge or lack thereof of HPV infection, and other myths related to HPV susceptibility [20]. Studies investigating the risk of students acquiring genital HPV infection and the risk of developing cervical cancer have reported values ranging between 13% and 42% [21, 22], and 20% to 68% [22, 23] respectively. Other surveys conducted among university students in diverse settings have shown highly variable rates of awareness of genital HPV infection and of HPV vaccines [24 - 27].

Several studies on the knowledge of HPV infection and the attitude towards HPV vaccination have been done in Cameroon but very little or no data exists on this subject for university students or young adults in the country. It is for this reason that this study was initiated to assess the knowledge of HPV infection among male and female university students, and their attitude towards HPV-related diseases and HPV vaccination, in four randomly selected State Universities in Cameroon.

Comment [3]: what to expect from the results of this study? more focus on secondary and tertiary prevention efforts.

2. METHODOLOGY

Study design and participants

This was a cross-sectional descriptive study that was conducted between April and July 2022. Included participants were young adults of both sexes aged between 18 and 25 years, who were attending randomly selected State universities located in different geographic regions in Cameroon (The University of Bamenda, University of Buea, University of Douala and University of Ngaoundere). Participation in this study was completely voluntary after obtaining an informed consent from every participant. Ethical clearance for this study was obtained from the Faculty of Health Sciences Institutional Review Board of the University of Bamenda in Cameroon.

Data collection and questionnaire

The survey instrument was a self-administered anonymous questionnaire which was also translated into French where necessary. This questionnaire was slightly adapted from previous studies [28, 29]. Participants were randomly given questionnaires to fill in on campus during week days and on weekends in randomly selected student hostels. A total of 50 students were randomly selected to pretest~~pre-test~~ the questionnaire in a pilot study, and we then modified parts of the questionnaire for improvement. These 50 volunteers were excluded from the final sample. In the questionnaire pretest~~pre-test~~, approximately 50% of the participants knew about HPV and the vaccine. Hence assuming a 50% awareness of HPV, with a 5% permissible error and 95% confidence interval, a sample size of at least 350 was therefore required per study site.

Statistical analyses

Completed and returned questionnaires were entered into Microsoft Excel 2013. To assess participants' knowledge of HPV and the HPV vaccine, we asked them 7 key questions. To verify the reliability and consistency of these questions, we decided to measure the Cronbach's alpha value of this instrument as was done elsewhere [28, 29], and a value of 0.857 was obtained, which is considered satisfactory. Depending on the number of correct answers to the 7 questions about knowledge of HPV and its vaccines, each participant was categorized~~categorised~~ into one of two groups - poor level of knowledge (if the participant answered 0 to 3 questions correctly), and good level of knowledge (when the participant answered 4 to 7 questions correctly). All data from Excel was imported to SPSS version 23 software and analyzed~~analysed~~. Chi-square test and logistic regression were used to examine any differences in the level of HPV knowledge. Descriptive statistics were used to analyse participants' demographics and attitudes towards HPV vaccination. Statistical tests were two-sided, and a p-value less than 0.05 was considered statistically significant. Only variables with $p < 0.1$ in the Chi-square test were used in logistic regression analyses.

3. RESULTS AND DISCUSSION

This study is one of the first to report the knowledge, attitudes and practices towards HPV and its vaccine among young university-going adults in Cameroon and the Central African sub-region. A total of 1400 university-going young adults were invited to participate in this survey. Of this number, 1263 questionnaires were successfully returned and these data were analyzed~~analysed~~. This survey registered slightly more females (51.1%) than males (48.9%) and a majority (90.4%) of all participants were unmarried (Table 1). Most participants (78.9%) were undergraduate students aged between 20 - 21 years (32.7%).

Most participants' (43.9%) families resided in urban areas, and 59.5% of them had monthly family incomes below 200,000 FCFA (approximately USD 320).

3.1 Knowledge of HPV infection, HPV-related diseases and HPV vaccine

Overall (taking all 1263 participants into consideration whether or not they had ever heard of HPV and/or its vaccine), only 87/1263 (6.9%) of participants had a good knowledge (answered 4 to 7 questions correctly) of HPV infection and vaccination. The remaining 93.1% of participants had a poor knowledge (answered 0 to 3 questions correctly). Of the 48.9% of participants who had heard of HPV, just 10.7% of them actually had a good knowledge of HPV infection and vaccination, with a mean ± SD knowledge score of 4.76 ± 0.28 on 7. Meanwhile, only 11.8% of participants who had ever heard of the HPV vaccine (38.2%) had a good knowledge of HPV infection and vaccination, with a mean ± SD knowledge score of 4.92 ± 0.13 on 7. More females (56.7%) had heard of HPV infection and vaccination and female participants (7.4%) also had a better knowledge of HPV infection and vaccination compared to the males (Table 1). Although 46.5% of all participants had a medical related background (Table 1), only 9.2% of them knew that HPV infection is related to cervical and other (oral, bladder, esophageal~~oesophageal~~, anal) cancers or warts. Furthermore, only 22.8% of all participants believed that a person infected with HPV must not necessarily show the signs and symptoms.

We are reporting a very low level of awareness and knowledge of HPV infection and vaccination, indicating the urgent need for mass education of young adults in the country. This will drastically improve not only the knowledge, but also the perceptions about this virus amongst young people who have been previously associated with many risk factors for exposure to the virus such as an early sexual debut and having multiple sexual partners [30]. Similar studies performed in different parts of the globe (Africa, China and other Asian countries) also reported a low or low-moderate level of knowledge on HPV infection and vaccination [29 - 32]. In Cameroon, health educational campaigns on infectious diseases like HIV, hepatitis B virus, poliovirus, etc., are very common, but hardly any such campaigns directly focusing on HPV. However, adult women in the country often tend to hear about HPV during sensitization and screening campaigns for cervical cancer. We also observed that more female participants had heard of, and were also more knowledgeable about HPV infection and vaccination. A similar observation was reported by Rashid *et al*. in India [33]. In Cameroon, females tend to seek medical attention more than males and so they interact more with healthcare personnel who can educate them on many health topics including HPV. Additionally, Mollers *et al*. [34] suggested in a study that parents, especially mothers, tend to pass on knowledge on health issues to their daughters, as they observed that vaccinated girls were more likely to know about cervical cancer if their mothers had previously been screened for it.

Table 1. Baseline demographic characteristics of the male and female participants

		Male n (%)	Female n (%)	Total n (%)
Total Number		618 (48.9)	645 (51.1)	1263 (100)
Marital status				
	Married	45 (8.9)	51 (10.2)	96 (9.6)

Single	459 (91.1)	449 (89.8)	908 (90.4)
Age			
18-19yrs	123 (20.2)	206 (33.0)	329 (26.7)
20-21yrs	203 (33.3)	200 (32.0)	403 (32.7)
22-23yrs	165 (27.1)	153 (24.5)	318 (25.8)
24-25yrs	118 (19.4)	66 (10.6)	184 (14.9)
Educational level			
Undergraduate / HND	468 (77.9)	504 (79.9)	972 (78.9)
Postgraduate	133 (22.1)	127 (20.1)	260 (21.1)
Field of study			
Medical related	208 (34.6)	361 (57.9)	569 (46.5)
Non-medical related	393 (65.4)	262 (42.1)	655 (53.5)
Religious affiliation			
Christian	485 (81.0)	510 (79.9)	995 (80.4)
Muslim	90 (15.0)	97 (15.2)	187 (15.1)
Atheist	14 (2.3)	23 (3.6)	37 (3.0)
Baha'i	7 (1.2)	8 (1.3)	15 (1.2)
Buddhist	3 (0.5)	0 (0.0)	3 (0.2)
Family monthly income			
Below 200,000frs	362 (64.5)	315 (54.7)	677 (59.5)
200,000 - 400,000frs	140 (25.0)	195 (33.9)	335 (29.5)
Above 400,000frs	59 (10.5)	66 (11.5)	125 (11.0)
Family/parents' residence			
Rural	171 (29.2)	116 (19.1)	287 (24.0)
Semi-urban	178 (30.4)	205 (33.7)	383 (32.1)
Urban	237 (40.4)	287 (47.2)	524 (43.9)

Father's education level			
Primary	157 (26.0)	107 (17.3)	264 (21.6)
Secondary	202 (33.4)	225 (36.3)	427 (34.9)
University	246 (40.7)	288 (46.5)	534 (43.6)
Mother's education level			
Primary	175 (29.0)	129 (20.4)	304 (24.6)
Secondary	218 (36.2)	238 (37.7)	456 (36.9)
University	210 (34.8)	265 (41.9)	475 (38.5)
Heard of HPV			
Yes	252 (40.8)	366 (56.7)	618 (48.9)
No	366 (59.2)	279 (43.3)	645 (51.1)
Level of HPV Knowledge			
Poor knowledge	579 (93.7)	597 (92.6)	1176 (93.1)
Good knowledge	39 (6.3)	48 (7.4)	87 (6.9)
Heard of HPV vaccination			
Yes	205 (33.2)	277 (42.9)	482 (38.2)
No	413 (66.8)	368 (57.1)	781 (61.8)
Already vaccinated for HPV			
Yes	87 (14.1)	105 (16.3)	192 (15.2)
No	531 (85.9)	540 (83.7)	1071 (84.8)
Plan to be vaccinated			
Yes	238 (49.8)	251 (51.4)	489 (50.6)
No	240 (50.2)	237 (48.6)	477 (49.4)
Sexual experience			
Yes	448 (75.2)	412 (68.7)	860 (71.9)
No	148 (24.8)	188 (31.3)	336 (28.1)

Frequency of sexual intercourse			
Never	168 (28.0)	217 (35.2)	385 (31.6)
Occasionally	167 (27.8)	155 (25.1)	322 (26.4)
Very often	73 (12.1)	52 (8.4)	125 (10.3)
No answer	193 (32.1)	193 (31.3)	386 (31.7)
Frequency of condom use			
Always	144 (36.1)	107 (28.2)	251 (32.3)
Never	85 (21.3)	75 (19.8)	160 (20.6)
Sometimes	170 (42.6)	197 (52.0)	367 (47.2)

** numbers for some parameters do not add up to the total number of the study population due to missing values*

3.1.1 Factors affecting knowledge of HPV infection and vaccination

We assessed some factors potentially associated with knowledge of HPV infection and vaccination. Young adults enrolled in medically related programmes in the universities surveyed had a significantly better knowledge of HPV infection and vaccination (*P*< .0001) compared to their counterparts in non-medically related disciplines (Table 2). Father's education level was also significantly associated (*P* = .008) with having a good knowledge of HPV infection and vaccination. Other factors found in this study to be significantly associated with having a good knowledge of HPV infection and vaccination include plans by the participant to become vaccinated (*P* = .004), and participants' sexual history or experience (*P* = .04). Sexually inexperienced participants and those who planned on getting the HPV vaccine had a significantly better knowledge of HPV infection and vaccination. All parameters in Table 2 with $P \leq .1$ were further tested in a logistic regression analysis. Educational level (OR 3.11, 95% CI (1.24 – 7.85), *P* = .02), field of study (OR 0.42, 95% CI (0.17 – 1.04), *P* = .04) and plans to become vaccinated (OR 0.33, 95% CI (0.14 – 0.76), *P* = .009) are predictors of good knowledge of HPV infection and vaccination in this study.

The significant association between having a medically related background and a good knowledge of HPV infection and vaccination observed in this study is expected because students in medically related disciplines do actively learn in school about many different diseases and their respective causes or causative agents including HPV. Furthermore, participants in the postgraduate level of study, as well as those who planned on becoming vaccinated in future were more likely to have a good knowledge of HPV infection and vaccination. Postgraduates are more mature and academically more experienced than their juniors in the undergraduate level. This could be a possible explanation to their having a better knowledge of HPV infection and vaccination. We are also reporting a greater proportion of participants with highly educated fathers (up to university level of education), having a significantly better knowledge of HPV infection and vaccination. Several studies have demonstrated before now that there is a significant association between having a higher level of education and a higher level of knowledge about HPV [35 - 37]. In Cameroon and most parts of Africa, fathers are the heads of families and always have a great influence on the upbringing of their offspring. A highly educated father is probably more aware of many health issues than a poorly educated one, and the former would tend to educate the family about these health issues and/or ensure that their children also attain similar levels of education. Participants who planned on becoming vaccinated in future were probably driven by their good knowledge of HPV infection to take this informed decision.

Overall, our findings suggest that more efforts are needed to improve students' perceptions towards HPV and its vaccines, especially amongst undergraduates, non-medical students and communities with poorly educated parents. Elsewhere [29], the female gender, an age above 22 years and having family members or friends who were vaccinated were predictors of a high level of knowledge about HPV and the vaccine. Although we did not find family monthly income correlating with knowledge of HPV in this study, a Swedish study [38] showed that income is another factor.

Table 2. Characteristics of participants according to knowledge about HPV and vaccination

	Poor knowledge of HPV n	Good knowledge of HPV n	p-value[∞]
Gender			
Males	579	39	0.427
Females	597	48	
Marital status			
Married	90	6	0.925
Single	849	59	
Age			
18-19yrs	306	23	
20-21yrs	372	31	0.787
22-23yrs	297	21	
24-25yrs	174	10	
Educational level			
Undergraduate	909	63	0.124
Postgraduate	236	24	

Field of study			
Medical related	507	62	< 0.0001*
Non-medical related	632	23	
Religious affiliation			
Christian	925	70	
Muslim	174	13	0.664
Atheist	36	1	
Baha'i	15	0	
Buddhist	3	0	
Family monthly income			
Below 200,000frs	637	40	0.268
200,000 - 400,000frs	310	25	
Above 400,000frs	113	12	
Family/parents' residence			
Rural	267	20	0.371
Semi-urban	352	31	
Urban	494	30	
Father's education level			
Primary	247	17	0.008*
Secondary	408	19	
University	483	51	
Mother's education level			
Primary	285	19	0.575
Secondary	426	30	
University	437	38	
Already vaccinated for HPV			

Yes	179	13	0.944
No	997	74	
Plan to be vaccinated			
Yes	445	44	0.004*
No	456	21	
Sexual experience			
Yes	809	51	0.043*
No	305	31	
Frequency of sexual intercourse			
Never	350	35	0.082
Occasionally	301	21	
Very often	122	3	
Would not like to answer	359	27	
Sexual practices			
Vaginal	292	22	
Oral	72	2	
Anal	59	2	0.085
Vaginal, Oral and Anal	57	2	
None	238	30	
Would not like to answer	273	22	
Vaginal and Oral	19	1	
Frequency of condom use			
Always	234	17	0.414
Never	154	6	
Sometimes	344	23	

∞ chi-square test

** statistically significant*

numbers for some parameters do not add up to the total number of the study population due to missing values.

3.2 Attitudes towards HPV vaccination

Overall, 482/1263 (38.2%) of participants had heard about HPV vaccination, most of whom were of the female gender (42.9%). This correlates with the finding that females in this study were more knowledgeable about HPV infection. Hearing about HPV vaccination was significantly associated with a good knowledge of HPV infection and vaccination ($P < .0001$). This is expected because educational information about an infectious disease is incomplete without mentioning any treatment and/or preventive measures. Consequently, those who have heard about HPV should certainly also know there is vaccine against it. Asked where/how they heard about HPV infection and vaccination, participants mostly indicated that they heard about it in school (36.3%), from a healthcare professional (32.9%) or via the internet (16.9%). Only 7.8% of participants heard of HPV from family members and friends while the rest heard of it over the television and/or radio. In a Brazilian national survey [39], Kops *et al.* showed that the media (television, Internet and/or radio), health professionals, school or friends were the main sources of information on HPV knowledge and vaccination. They concluded that the best information sources were the combination of health professionals and the media. Social media in particular would be a vital tool to use in disseminating information about HPV infection and vaccination in the Cameroonian setting and elsewhere, since this is the media which entices or appeal to most young adults.

In this study, only 15.2% of the young adults sampled were already vaccinated against HPV. Knowledge of HPV can possibly influence uptake of the vaccine. Students with clinical majors having a leading edge on knowledge, and a positive attitude towards the HPV vaccine, have shown significantly higher vaccination rates [29]. We are reporting an overall positive attitude of participants towards HPV vaccination as 69.9% of the vaccinated population in this study were willing to recommend the vaccine to others. When unvaccinated participants were asked if they planned to receive the vaccine in future, 50.6% said yes, meanwhile the rest of them (49.4%) refused, citing cost and safety reasons. Elsewhere [39], being outside of the age group covered by the public health system, not knowing about the vaccine, not having received medical advice about the vaccine and paying for the vaccine were the major reasons advanced for not haven been vaccinated. In a study of Nigerian female students, 60% of the students who were aware of HPV vaccines were willing to get vaccinated [31]. Meanwhile in Italy [40], 81.7% of respondents expressed willingness to have the HPV vaccine. HPV educational programs and national HPV immunization programs should be implemented and/or strengthened by countries to increase the awareness of HPV vaccines and willingness of young adults to become vaccinated. Additionally, more efforts should be made to improve the availability and affordability of these vaccines in Cameroon and other resource-limited settings.

Comment [4]: Explain the association of knowledge and attitudes to certain behaviors. Explain using behavioral theory.

3.3 Risky sexual practices and behaviours

Sexual activity is a relevant contributing factor to sexual infections. Factors like the age at which sexual activity commences, the number of sexual partners, characteristics of these partners, as well as one's sexual networks have been linked with transmission of genital HPV [7]. Overall, a majority of participants in our study (71.9%) were sexually active or at least had some form of sexual activity in the past. In neighbouring Nigeria, a similar study found 58.6% of the students not sexually active [31]. Some participants in our study were found to indulge in certain risky sexual practices (Table 2). Among the sexually active or sexually experienced participants, vaginal sex was most practiced than oral and anal sex, although some participants clearly opted not to provide this information probably because of privacy reasons. From the logistic regression performed, participants without any form of sexual history (vaginal, anal or oral) were five times more likely to be knowledgeable about HPV infection and vaccination compared to those with some form of sexual experience. However, this observation was not statistically significant (OR = 5.15; 95% CI = 0.62 - 22.59; *P* = .13). This finding is contrary to that of another study in China where college students with sexual experience(s) were more likely to have heard about HPV and the vaccine than those without any sexual experience, and sexual experience was also related to a greater willingness to become vaccinated [29].

The risky sexual behaviours of young adults including university students has been attributed as reason for a high prevalence of genital HPV infection in this group of persons [20]. Frequency of condom use by participants in this present study is reported. Overall, most participants (47.2%) only use condoms sometimes, 32.3% use it every time, meanwhile 20.6% of them do not use it at all. In a multicentre, national survey of Brazilian sexually active adolescents and young adults, 53% of them used a condom during sex. Condom use among young adults in sub-Saharan Africa is lower than levels advocated by the United Nations. In Africa, indulging in risky sexual behaviours is worryingly very common and on the rise amongst young people [41], who are increasingly seen engaging in risky sexual practices like early sexual debut, infrequent or no use of condoms, having age-disparate relationships and multiple sex partners. Having multiple sex partners was another risky sexual practice observed in this study (Figure 1). While most participants (50.7%) hadn't any sex partner at the time of this survey, 34.2% of respondents had a single partner, whereas 15.1% reported having more than one sex partner. Disturbingly, only 25.7% of respondents having more than a single sex partner, used condoms every time during sexual intercourse. Lastly, there was no significant association (*P* = .06) between number of sex partners and knowledge of HPV infection and vaccination (Figure 1).

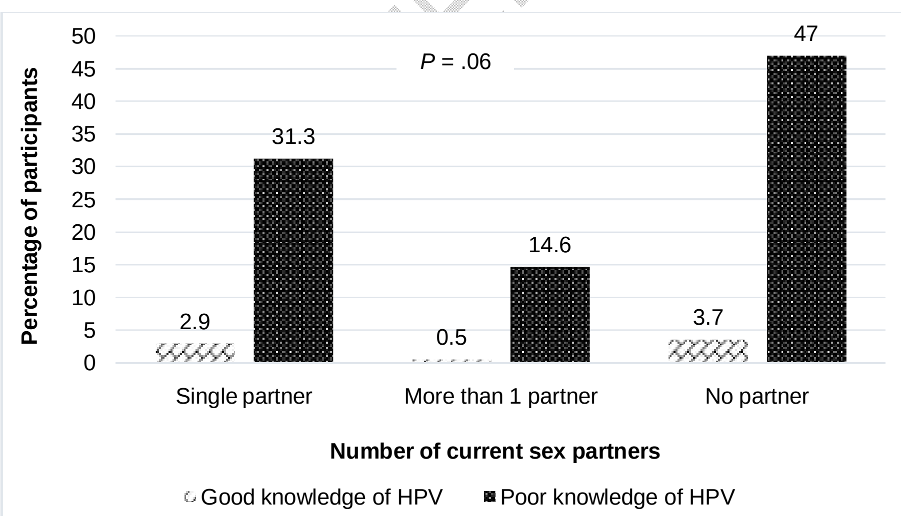

Fig. 1. Number of sex partners and knowledge of HPV

4. CONCLUSION

We are presenting one of the very first reports on knowledge, attitudes and practices towards HPV infection and vaccination among young adults attending universities in Cameroon. This study reveals a very low level of awareness and knowledge of HPV infection and vaccination. The attitude of participants towards HPV vaccination was generally positive. Several risky sexual behaviours were highlighted including low condom use and having multiple sexual partners. These findings underscore the importance of educational programs and emphasize the need to develop public health policies targeted to this age bracket. Appropriate measures should be taken to increase students' awareness of the risks associated with HPV infection, as this can potentially increase the vaccination rate in the country. School-based and social media-based health education programs will certainly play a vital role to improve public awareness about HPV infection and vaccination. Schemes should be put in place to endeavour that available HPV vaccines approved for the prevention of cervical cancer, be given to adolescents before sexual debut.

Comment [5]: So, make recommendations that focus on promotional and preventive efforts for adolescents who are already sexually active and who will become sexually active.

CONSENT

All authors declare that written informed consent was obtained from participants for this study. Copies of the signed consent forms are available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki. Participants were voluntarily enrolled into this anonymous survey after providing a signed informed consent form. To protect participants' privacy, all data collected in this study was treated as highly confidential and only made available to the research team. Participants had no financial or material remuneration of any kind and were free to withdraw from the study at any time, without giving a reason and without any cost. Ethical clearance for this study was obtained from the Faculty of Health Sciences Institutional Review Board of the University of Bamenda, Cameroon (Project Identification Number: 2022/0775H/UBa/IRB).

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