

Knowledge, Attitude, and Practice Toward Cervical Cancer Screening Among Female University Students in Ishaka Western Uganda

Ibe Michael Usman¹, Naguledaticha Chama², Eric O Aigbogun Jr³, Annet Kabanyoro⁴, Keneth Iceland Kasozi⁵, Comfort Ojochenemi Usman⁶, Mario Edgar Fernandez Diaz¹, Elisa Ndyamuhakyi¹, Victor Bassey Archibong⁷, Comfort Onongha⁴, Juma John Ochieng¹, Rogers Bariture Kane⁸, Robinson Ssebuufu⁹

¹Department of Human Anatomy, Kampala International University Western Campus, Bushenyi, Uganda; ²Department of Surgery, Kampala International University Teaching Hospital, Ishaka, Uganda; ³Department of Human Anatomy, Enugu State University of Science and Technology, Enugu, Nigeria; ⁴Department of Nursing, Aga Khan University, Kampala, Uganda; ⁵Physiology Department, Kabale University, Kabale, Uganda; ⁶Nursing Department, Ahmadu Bello University Teaching Hospital, Tudun Wada, Nigeria; ⁷Department of Human Anatomy, University of Rwanda, Kigali, Rwanda; ⁸Institute of Geo-Science and Space Technology, Rivers State University, Port Harcourt, Nigeria; ⁹Department of Surgery, Mengo Hospital, Kampala, Uganda

Correspondence: Ibe Michael Usman, Department of Human Anatomy, Kampala International University Western Campus, Bushenyi, Uganda, Tel +256706666798, Email gopama13@gmail.com

Purpose: Cervical cancer (CC) is the leading cause of cancer-related death among women living in third-world countries. CC is preventable, with the possibility of complete treatment if detected early. The objective of the study was to assess the level of knowledge, attitude, and practice on CC screening (CCS) among female university students (FUS) in Ishaka, western Uganda.

Methods: The study was a descriptive cross-sectional study among FUS (n = 407) in western Uganda conducted after the first nationwide lockdown in Uganda. Information was collected using a questionnaire and descriptively presented as frequency and percentages.

Results: The majority of our respondents were medical students 283 (69.5%), below 25 years 339 (83.3%), with Anglican Christian religious background 150 (36.9%). Respondents above the age of 25 years (p = 0.0052) and those in the medical profession (p < 0.001) had more knowledge. More medical students had a better attitude (p = 0.0043) and favorable practices (0.0134) compared to their non-medical counterparts. There is a weak correlation between attitude (r = 0.206, p < 0.001) and practice (r = 0.181, p = 0.0003) with knowledge on CCS.

Conclusion: Observation from the present study suggests the need for more efforts in the fight against cervical cancer and encouragement of positive attitude and practice towards cervical cancer screening and uptake of vaccination.

Keywords: cervical cancer screening, human papillomavirus, university students, Uganda cancer control

Introduction

Cervical cancer is the fourth most prevalent cancer among women of reproductive age globally¹ and the leading cause of cancer-related death among women living in third-world countries, including Uganda.² Each year, Uganda witnesses an increase in reported cases of cervical cancer, with an estimated 6413 new cases annually.³ The risk factors for cervical cancer include: previous or current sexually transmitted infections (human papilloma virus infection (HPV)), early age of onset of sexual activity, multiple sexual partners, increasing parity, prolonged use of hormonal contraceptives, and smoking.⁴⁻⁷

The link between HPV infection and CC has been well-known for a long time.⁸ HPV has a global prevalence of 99.7% among women with cervical carcinomas.⁸ HPV has got numerous genotypes responsible for both anogenital and non-genital warts, however, carcinogenesis is mostly seen in high-risk or carcinogenic genotypes.⁸ HPV types 16 and 18 contribute to around 70% of CC cases globally, while types 31, 33, 35, 45, 52, and 58 account for about 20% of the cases.⁸

Cervical cancer is preventable, with possibility of complete treatment if detected early,⁸ as cervical cancer evolves slowly from detectable precancerous lesions in its metastatic stage.⁹ The inculcation of a regular screening uptake and routine check-up among women of reproductive age is the sure way of reducing the incidence of cervical cancer⁹ and subsequent reduction in cervical-cancer-related deaths among women in Uganda. However, implementing effective screening programs for early detection of precancerous lesion has been difficult in most under developing countries, particularly in Uganda.^{2,10} This trend is particularly expected to be higher among the vulnerable population including students, who were significantly affected by the lockdown following the closure of schools and suspension of academic activities.^{11–17}

The rapid spread of Covid-19 triggered a global response that saw the diversion of enormous resources to contain it, thus resulting in the underfunding of other health-related issues such as HIV/AIDS, diabetes, Malaria, Ebola and cervical cancer being given lesser attention.¹⁸ This trend is bound to be more prominent in under-developed countries like Uganda, where prior to the outbreak of COVID19 had depended on donors and partners to fund programs targeted at various health-care challenges.²

Knowledge and attitudes in every given population play very important roles on practices.¹⁹ Therefore, it is important to look into the level of knowledge, attitude and practices towards cervical cancer screening uptake among university students of reproductive age. The objective of the present student study is to assess the level of knowledge, attitude and practice towards cervical cancer screening uptake among female university students in Kampala International University in the face of a global attention being shifted to COVID19.

Materials and Methods

Study Design and Setting

This was a descriptive cross-sectional study among female university students, above 18 years of age in Kampala International University, Western Campus Uganda (KIU-WC). The targeted population of this study were female students of KIU-WC. Females above 18 years of age are considered adults in most countries and of reproductive age.²⁰ The university students were considered to be a vulnerable following the closure of schools and the suspension of academic activities. The study was conducted during the phase of the nationwide lockdown in Uganda (May and June). A simple random sampling technique was employed. The study included female students who were 18 years of age and above – who consented to participate in the study. Those that did not meet the inclusion criteria were excluded. Students that decline to participate or requested to withdraw during the study.

Data Collection and Measures

A closed-ended pretested questionnaire comprising multiple-choice questions was employed. The questionnaire measured sociodemographic data (age, educational level, relationship status, religion, course of studies and ethnicity), knowledge, attitude, and practices.

The questionnaire was reviewed and validated by different experts ([Supplementary File](#)). A total of 407 students were recruited for the study. The internal consistency of the questionnaire was determined through test-retest with a Cronbach's $\alpha = 0.85$.

Study Construct Model

The study built the construct model in [Figure 1](#) - based on theoretical presentations and empirical evidence of the relationship between certain sociodemographic characteristics and knowledge, attitude, and practices towards health-related activities.^{21–28}

Study Variables

Independent Variables

Demographic details include age, educational level, relationship status, religion, and course of studies.

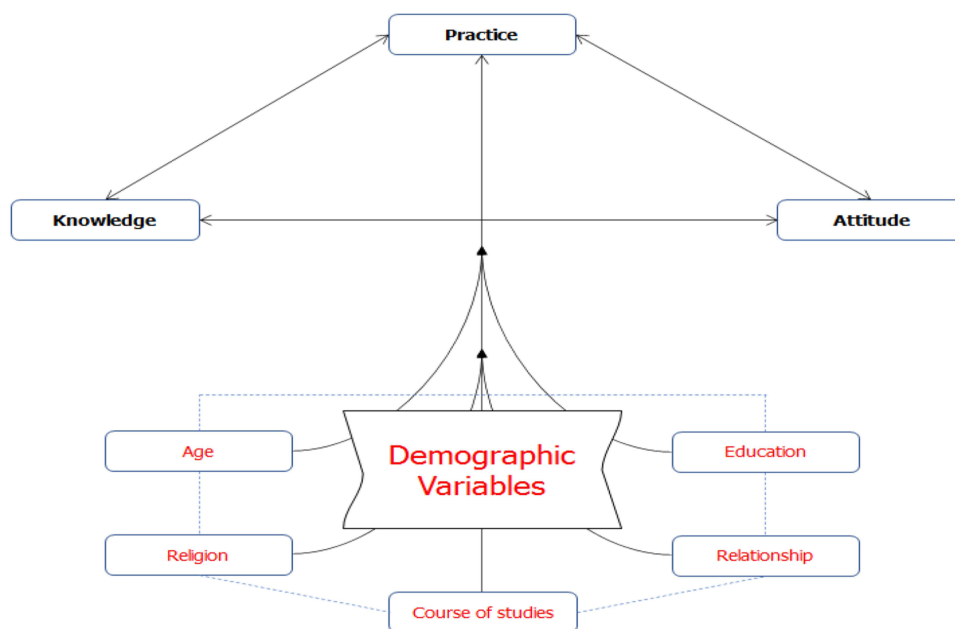


Figure 1 The study construct model of the relationship between KAP and the changes with regard to demographic characteristics.

Dependent Variables

Knowledge, attitude, and practices.

Knowledge

Our study assessed knowledge on specific facts regarding cervical cancer and cervical screening uptake. These questions include the following: Human papilloma virus (HPV) is the underlying cause of cervical cancer, HPV is a common sexually transmitted infection, are you aware of the different strains of HPV? The risk factors for cervical cancer include (multiple sexual partners, early age of onset of sexual activity, increasing parity, prolong use of hormonal contraceptives, current or previous sexually transmitted infection, smoking), are you aware cervical screening can help in the early detection of precancerous lesion, early detection of precancerous lesion can help in the prevention and treatment of cervical cancer, precancerous lesions take long time to progress to cervical cancer, are you aware that vaccine for HPV may prevent development of cervical cancer? Each correct response weighed 1 point and 0 for incorrect responses. The higher the average score, the more knowledge the female university students have.

Attitude

The attitude among female university students in Kampala International University was assessed using 3 questions. The responses were: Yes and No. Response showing positive attitude was assigned 1 and negative attitude was assigned 0. The higher the average score for attitude, the better the attitude among the female university students.

Practices

Practices were assessed using five questions. These questions were developed following a thorough literature search: Do you smoke? Have you previously gone for Pap smear examination? Have you been vaccinated against HPV? Have you had more than one sex partner? Do you use condom during sex? The responses were: Yes and No. Proper responses were assigned 1 and improper responses were assigned 0. The higher the score, the better practice among the university students.

Data Management and Analysis

The data were cleaned and organised in Microsoft Excel 2016, then transferred into Statistical Package for Social Sciences version 23 (IBM® Armonk, USA) and STATGRAPHICS centurion CVI version 16.1.11 (StatPoint Tech., Inc.) for analysis. SPSS descriptive statistics were used to describe study demographic variables in frequency (%). Mann–Whitney U (for multiple variables) and Kruskal Wallis (for binary variables) tested the distributional differences in composite scores of the demographic groups. STATGRAPHICS Multifactor ANOVA evaluated the demographic differences in composite scores for knowledge, function and use. The relationships between knowledge, function, and use were estimated using Spearman ranked correlation. All analyses were performed at 95% confidence level and p-values less than 0.05 were considered significant. For categorization, respondents who scored above 60% were considered to have sufficient knowledge, positive attitude, and favorable practices since there is no standardized cut off mark for the region. Data files for the present study can be accessed at <https://figshare.com/s/11343713b814109f9d7e>.

Ethics Approval and Consent to Participate

All methods performed in the study were in accordance with the Declaration of Helsinki. Expedited ethical approval was obtained from Kampala International University Ethical Review Board and registered as (KIU-REC-023/202018). Informed consent was obtained from all subjects.

Results

Sociodemographic Data of the Study Participants

Large proportion of our respondents had diploma 193 (47.4%), with no sexual partner 319 (78.4%), were Anglican Christian background 150 (36.9%). Majority of our respondents were medical students 283 (69.5%) and below the age of 25 years 339 (83.3%) (Table 1).

Table 1 Sociodemographic Characteristics of the Study Participants

	Baganda	Bayankole	Banyoro	Foreigner	Others	Total
Level of education						
Certificate	15 (19.0)	10 (6.4)	11 (32.4)	8 (27.6)	32 (29.6)	76 (18.7)
Diploma	39 (49.4)	85 (54.1)	12 (35.3)	11 (37.9)	46 (42.6)	193 (47.4)
Bachelor	24 (30.4)	57 (36.3)	8 (23.5)	8 (27.6)	26 (24.1)	123 (30.2)
Postgraduate	1 (1.3)	5 (3.2)	3 (8.8)	2 (6.9)	4 (3.7)	15 (3.7)
Relationship status						
No sexual partner	64 (81)	128 (81.5)	19 (55.9)	26 (89.7)	82 (75.9)	319 (78.4)
Sexual partner	15 (19.0)	29 (18.5)	15 (44.1)	3 (10.3)	26 (24.1)	88 (21.6)
Religion						
Anglican Christian	16 (20.3)	80 (51.0)	8 (23.5)	10 (34.5)	36 (33.3)	150 (36.9)
Catholic	32 (40.5)	53 (33.8)	14 (41.2)	8 (27.6)	32 (29.6)	139 (34.2)
Muslim	12 (15.2)	10 (6.4)	2 (5.9)	3 (10.3)	8 (7.4)	35 (8.6)
Pentecostal	6 (7.6)	10 (6.4)	1 (2.9)	6 (20.7)	12 (11.1)	35 (8.6)
Others	13 (16.5)	4 (2.5)	9 (26.5)	2 (6.9)	20 (18.5)	48 (11.8)
Field of Study						
Medical	69 (87.3)	62 (39.5)	31 (91.2)	27 (93.1)	94 (87.0)	283 (69.5)
Non-medical	10 (12.7)	95 (60.5)	3 (8.8)	2 (6.9)	14 (13.0)	124 (30.5)
Age group						
Below 26	72 (91.1)	129 (82.1)	27 (79.4)	20 (69)	37 (84.2)	339 (83.3)
Above 25	7 (8.9)	28 (17.9)	7 (20.6)	9 (31)	17 (15.8)	68 (16.7)

Knowledge, Attitude and Practices

More respondents above the age of 25 years ($\chi^2=12.080$, $df = 2$, $p = 0.002$) and those in the medical profession ($\chi^2=41.583$, $df = 2$, $p < 0.001$) had more knowledge on cervical cancer screening compared to their other counterparts (Table 2 and Table 3). Majority of our respondents agreed that human papillomavirus (HPV) is the underlying cause of cervical cancer 341 (83.8), HPV is a common sexually transmitted infection 286 (70.3), having multiple sexual partners is risk factors for cervical cancer 265 (65.1), are aware that cervical screening can help in the early detection of the precancerous lesion 332 (81.6), early detection of precancerous lesions can help in the prevention and treatment of cervical cancer 360 (88.5), precancerous lesions take a long time to progress to cervical cancer 241 (59.2), vaccine for HPV may prevent the development of cervical cancer 321 (78.9) (Table 4).

More medical students had better attitude ($\chi^2=10.559$, $df = 1$, $p = 0.001$) toward cervical cancer screening compared to their non-medical counterparts (Table 2 and Table 3). Majority of our respondents feel young women should screen for HPV early (386, 94.8), recommended regular screening for the early detection of precancerous lesions (365, 89.7), and feel young women should be vaccinated for HPV (384, 94.3) (Table 4).

More medical students had favorable practice ($\chi^2=7.581$, $df = 2$, $p = 0.023$) compared to their non-medical counterparts (Table 2 and Table 3). Majority of our respondents do not smoke 18 (4.4), but only a few have previously gone for Pap examination 65 (16.0), vaccinated against HPV 62 (15.2), use condom during sex 162 (39.8) (Table 4).

Generally, the majority of our respondents had sufficient knowledge 205 (50.4%), positive attitude 340 (83.5%), and engaged in unfavourable practices 268 (65.8%) (Table 5).

Relationship Between Knowledge, Attitude and Practices

There was a weak correlation between attitude ($r = 0.206$, $p < 0.001$) and practice ($r = 0.181$, $p = 0.0003$) with knowledge on cervical cancer screening uptake (Table 6).

Discussion

Early detection of precancerous lesion and vaccination are very important in the fight against cervical cancer globally.²⁹ To promote early detection of cervical cancer, knowledge and attitudes must be improved to enhance clinical practices (eg, cervical cancer screening and vaccination).³⁰ A large proportion of our respondents had a diploma, with no sexual partner, and were Anglican Christian background. Majority of our respondents were medical students and below the age of 25 years. More respondents above the age of 25 years and those in the medical profession had more knowledge on cervical cancer screening compared to their other counterparts. More medical students had a better attitude and more favorable practice compared to their non-medical counterparts. Generally, the majority of our respondents had sufficient knowledge, positive attitude, and engaged in unfavourable practices, with an observed weak correlation between attitude and practice with knowledge on cervical cancer screening uptake among our study population.

The finding from the present studies suggests possible impact of education on knowledge of health-related issues. Studying a medical-related course was associated with having more knowledge on cervical cancer screening and HPV, compared to their non-medical counterpart. This may be due to the fact that studying a medical related course exposes students to information that are of public health importance. Our finding is in line with the report by Altamimi³¹ who reported a significantly higher knowledge score among the medical college and applied medical science students. Pandey et al³² also demonstrated in their study among medical students that they had better knowledge about preventable nature of cervical cancer (89.6%), its HPV etiology (89.2%), and the availability of vaccine for prevention (75.6%). Medical teaching play definitive role in understanding public health-related issues.³² On the other hand, the observation in the present study is in contrast with the finding of Aga et al³³ who reported generally low knowledge among medical students of King Saud Bin Abdulaziz University for Health Sciences, Jeddah Campus, as 70% of the respondents had heard about cervical cancer, but only 27.9% and 18.6% knew that cervical cancer is common among women, and it is transmissible, respectively.

The proportion of those with sufficient knowledge (50.4%) in the present study was lower than that reported in other studies done in Uganda (60%) (12), Cote d'Ivoire (55.7%) (29), India (85%) (27). The reported low level of knowledge

Table 2 KAP Scores and Sociodemographic Characteristics of Study Participants

Terms	Age Category	Mean Rank μ	Study Field	Mean Rank μ	Level of Education	Mean Rank λ	Relationship	Mean Rank μ	Religion	Mean Rank λ
Knowledge	Above 25	230.4***	Medical	231.5***	Certificate	226.63	No Sexual partner	196.02	Catholic	206.63
	Below 26	198.70	Non-medical	141.24	Diploma	200.83	Sexual partner	232.94	Muslim	156.29
					Bachelors	191.36			Others	230.30
					Post-graduate	233.80			Pentecostal	249.97**
Attitude	Above 25	213.83	Medical	213.04***	Certificate	213.74	No Sexual partner	201.84	Catholic	207.86
	Below 26	202.03	Non-Medical	183.37	Diploma	198.77	Sexual partner	211.84	Muslim	198.20
					Bachelors	207.39			Others	206.65
					Post-graduate	194.13			Pentecostal	220.66
Practice	Above 25	230.43*	Medical	214.64***	Certificate	229.89	No Sexual partner	200.41	Catholic	196.24
	Below 26	198.70	Non-Medical	179.72	Diploma	193.83	Sexual partner	217.01	Muslim	209.80
					Bachelors	205.02			Others	211.18
					Post-graduate	195.30			Pentecostal	224.89
								Anglican	202.67	
								Christian		

Notes: Man Whitney U-test (μ), Kruskal Wallis (λ) (test of distributional differences); significant at * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Table 3 Term Significance in the Knowledge, Attitude, and Practice Regression Models

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Knowledge				
Age	269.443	12.080	2	0.002
Level of Education	260.135	2.772	6	0.837
Relationship	261.939	4.575	2	0.101
Religion	269.715	12.352	8	0.136
Field of study	298.946	41.583	2	<0.001
Attitude				
Age	149.642	0.596	1	0.44
Education	151.261	2.215	3	0.529
Relationship	149.176	0.129	1	0.719
Religion	151.204	2.157	4	0.707
Field of study	159.605	10.559	1	0.001
Practice				
Age	275.514	7.581	2	0.023
Education	271.169	3.236	6	0.779
Relationship	269.439	1.506	2	0.471
Religion	273.615	5.682	8	0.683
Field of study	269.567	1.634	2	0.442

Abbreviations: df, Degree of freedom; Sig., Significance.

Table 4 The Frequency of the Responses to the Knowledge Attitude and Practices Questions

S/N	Item	Frequency (Percentage)
Knowledge		
1	Human papillomavirus (HPV) is the underlying cause of cervical cancer	341 (83.8)
2	HPV is a common sexually-transmitted infection	286 (70.3)
3	Are you aware of the different strains of HPV?	137 (33.6)
4	The risk factors for cervical cancer include	
	Multiple sexual partners	265 (65.1)
	Early age of onset of sexual activity	177 (43.5)
	Increasing parity	50 (12.3)
	Prolong use of hormonal contraceptives	148 (36.4)
	Current or previous sexually transmitted infection	116 (28.5)
	Smoking	63 (15.5)
5	Are you aware cervical screening can help in the early detection of the precancerous lesion?	332 (81.6)
6	Early detection of precancerous lesions can help in the prevention and treatment of cervical cancer	360 (88.5)
7	Precancerous lesions take a long time to progress to cervical cancer	241 (59.2)
8	Are you aware that a vaccine for HPV may prevent the development of cervical cancer?	321 (78.9)

(Continued)

Table 4 (Continued).

S/N	Item	Frequency (Percentage)
Attitude		
9	Do you feel young women should screen for HPV early?	386 (94.8)
10	Do you recommend regular screening for the early detection of precancerous lesions?	365 (89.7)
11	Do you feel young women should be vaccinated for HPV?	384 (94.3)
Practices		
12	Do you smoke?	18 (4.4)
13	Have you previously gone for Pap examination?	65 (16.0)
14	Have you been vaccinated against HPV?	62 (15.2)
15	Have you had more than one sex partners?	136 (33.4)
16	Do you use condom during sex?	162 (39.8)
17	Do you use hormonal oral contraceptive?	99 (24.3)

Table 5 Knowledge, Attitude, and Practices

	Categories	Frequency (%)
Knowledge	Sufficient	205 (50.4)
	Insufficient	202 (49.6)
Attitude	Positive	340 (83.5)
	Negative	67 (16.5)
Practices	Favourable	139 (34.2)
	Unfavourable	268 (65.8)
Total		407 (100)

Table 6 Relationship Between Knowledge, Attitude, and Practice Regression Models

		Knowledge	Attitude
Attitude	r	0.206	
	P-value	<0.001	
Practice	r	0.181	0.0449
	P-value	0.0003	0.3655

Note: Spearman Rank correlation coefficient (r).

observed in this study, despite lowering the cutoff mark to 60% can be linked to the general education level of a majority (Certificate & Diploma; 66.1%) of the study participants. The proportion of those with positive attitudes (83.5%) in the present study was higher than that reported among rural health-care workers in Uganda (12). However, the relationship between the level of knowledge and attitude was a weak one.

The level of knowledge may be said to have affected attitude and practices towards cervical cancer screening and HPV among medical students in the present study, since more medical students had a better attitude and more favorable

practice compared to their non-medical counterparts. This is not surprising, since knowledge generally mold attitude and practices.¹⁹ However, this was not the case with the general population considering the observed weak correlation existing between attitude and practice with knowledge on cervical cancer screening uptake among our study population. The weak correlation existing between attitude and practice with knowledge is in line with the finding from the study conducted by Mutyaba et al³⁴ among medical health workers in Mulago, Uganda; where they reported that despite having high knowledge on cervical cancer and prevention by screening using a Pap smear, attitudes and practices towards screening remained negative. In the present study, only a few respondents have previously gone for pap examination, vaccinated against HPV, and use condom during sex, therefore responsible for the observed high score for unfavourable practice.

The sample population in this study were students of KIU-Western Uganda, and hence, the results do not necessarily reflect that of the general Ugandan population. Causal relationships between selected factors and the level of knowledge, attitude, and practices among our study population due to the study design. The convenient sampling method used in this study and introduced selection bias. The self-reporting nature of the participants' answers could result in underreporting or exaggeration of the responses, and recall bias. However, the present study emphasized paying of more attention to the nonmedical students in the fight against CC and consequent encouragement of CCS and uptake of HPV vaccine among university students.

Conclusion

Generally, the majority of the respondents had sufficient knowledge, positive attitude, and engaged in unfavourable practices, with a weak correlation existing between attitude and practice with knowledge on cervical cancer. Hence, emphasizing the need for more work on the side of policy maker in achieving improved favourable practices toward the prevention of cervical cancer in the study population. The course of study and age affected the levels of knowledge, attitude, and practice in the present study. Therefore, suggesting that these two factors could play a very important role in improving the level of knowledge, attitude, and practice on cervical cancer screening among the study population.

Disclosure

The authors report no conflicts of interest in this work.

References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2018;68(6):394–424. doi:10.3322/caac.21492
2. Nakisige C, Schwartz M, Ndira AO. Cervical cancer screening and treatment in Uganda. *Gynecol Oncol Rep.* 2017;20:37–40. doi:10.1016/j.gore.2017.01.009
3. Bruni L, Barrionuevo-Rosas L, Albero G, et al. Human papillomavirus and related diseases report/ Uganda; 2019.
4. Roura E, Castellsagué X, Pawlita M, et al. Smoking as a major risk factor for cervical cancer and pre-cancer: results from the EPIC cohort. *Int J Cancer.* 2014;135(2):453–466. doi:10.1002/ijc.28666
5. Beral V. Reprint of 'Cancer of the cervix: a sexually transmitted infection'? *Cancer Epidemiol.* 2015;39(6):1148–1151. doi:10.1016/j.canep.2015.08.005
6. Fonseca-Moutinho JA. Smoking and cervical cancer. *ISRN Obstet Gynecol.* 2011;2011:1–6. doi:10.5402/2011/847684
7. Gierisch JM, Coeytaux RR, Urrutia RP, et al. Oral contraceptive use and risk of breast, cervical, colorectal, and endometrial cancers: a systematic review. *Cancer Epidemiol Biomarkers Prev.* 2013;22(11):1931–1943. doi:10.1158/1055-9965.EPI-13-0298
8. Lintao RCV, Cando LFT, Perias GAS, et al. Current Status of Human Papillomavirus Infection and Cervical Cancer in the Philippines. *Frontier in Medicine.* 2022; 9:929062. doi:10.3389/fmed.2022.929062
9. World Health Organization. *Screening for Cervical Cancer.* World Health Organization; 2016.
10. Obol JH, Lin S, Obwolo MJ, Harrison R, Richmond R. Knowledge, attitudes, and practice of cervical cancer prevention among health workers in rural health centres of Northern Uganda. *BMC Cancer.* 2021;21(1):1–15. doi:10.1186/s12885-021-07847-z
11. Usman IM, Ssempijja F, Ssebuufu R, et al. Community drivers affecting adherence to WHO guidelines against COVID-19 amongst rural Ugandan market vendors. *Front Public Heal.* 2020;8:340. doi:10.3389/fpubh.2020.00340
12. Kasozi KI, MacLeod E, Ssempijja F, et al. Misconceptions on COVID-19 risk among Ugandan men: results from a rapid exploratory survey, April 2020. *Front Public Heal.* 2020;8:416. doi:10.3389/fpubh.2020.00416
13. Echoru I, Kasozi KI, Usman IM, et al. University lecturers and students could help in community education about SARS-CoV-2 infection in Uganda. *Heal Serv Insights.* 2020;13. doi:10.1177/1178632920944167
14. Ivanuš U, Jerman T, Gašper Oblak U, et al. The impact of the COVID-19 pandemic on organised cervical cancer screening: the first results of the Slovenian cervical screening programme and registry. *Lancet Reg Heal Eur.* 2021;5:100101. doi:10.1016/J.LANEPE.2021.100101

15. Archibong V, Usman IM, Kasozi KI, et al. Anxiety, anger and depression amongst low-income earners in Southwestern Uganda during the COVID-19 total lockdown. *Front Public Health*. 2021;1:1725. doi:10.3389/FPUBH.2021.590458
16. Birmingham WC, Wadsworth LL, Lassetter JH, Graff TC, Lauren E, Hung M. COVID-19 lockdown: impact on college students' lives. *J Am Coll Health*. 2021;1–15. doi:10.1080/07448481.2021.1909041
17. Lemuel AM, Usman IM, Kasozi KI, et al. COVID-19-related mental health burdens: impact of educational level and relationship status among low-income earners of Western Uganda. *Front Public Health*. 2021;9. doi:10.3389/FPUBH.2021.739270
18. UNPF Jordan. Covid-19: sexual and reproductive health and rights in times of crisis-Jordan brief united nations population fund sexual and reproductive health and rights in times of crisis; 2020.
19. Chala S, Houzmali S, Abouqal R, Abdallaoui F. Knowledge, attitudes and self-reported practices toward children oral health among mother's attending maternal and child's units, Salé, Morocco. *BMC Public Health*. 2018;18(1):1–8. doi:10.1186/s12889-018-5542-2
20. SRI. *Uganda Sexual Rights Database*. Sexual Right Initiative; 2020.
21. Bashar K, Al-Amin HM, Reza MS, Islam M, Ahmed TU, Ahmed TU. Socio-demographic factors influencing knowledge, attitude and practice (KAP) regarding malaria in Bangladesh. *BMC Public Health*. 2012;12(1):1084. doi:10.1186/1471-2458-12-1084
22. Taber KS. The use of cronbach's alpha when developing and reporting research instruments in science education. *Res Sci Educ*. 2018;48(6):1273–1296. doi:10.1007/s11165-016-9602-2
23. Zhong B, Luo W, Li H-M, et al. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *Int J Biol Sci*. 2020;16:1745–1752. doi:10.7150/ijbs.45221
24. Moran KR, Del Valle SY. A meta-analysis of the association between gender and protective behaviors in response to respiratory epidemics and pandemics. *PLoS One*. 2016;11(10):e0164541. doi:10.1371/journal.pone.0164541
25. Devkota HR, Sijali TR, Bogati R, Clarke A, Adhikary P, Karkee R. How does public knowledge, attitudes, and behaviors correlate in relation to COVID-19? A community-based cross-sectional study in Nepal. *Front Public Health*. 2021;8:589372. doi:10.3389/fpubh.2020.589372
26. Ndejjo R, Mukama T, Musabyimana A, Musoke D. Uptake of cervical cancer screening and associated factors among women in rural Uganda: a cross sectional study. *PLoS One*. 2016;11(2):e0149696. doi:10.1371/journal.pone.0149696
27. Sudharshini S, Anantharaman V, Chitra A. A cross-sectional study on knowledge, attitude, and practice on cervical cancer and screening among female health care providers of Chennai corporation, 2013. *J Acad Med Sci*. 2012;2(4):124. doi:10.4103/2249-4855.141132
28. Oche O, Kaoje U, Ango T. Cancer of the cervix and cervical screening: current knowledge, attitude and practices of female health workers in Sokoto, Nigeria. *Int J Med Med Sci*. 2013;5(4):184–190. doi:10.5897/IJMMMS2013.0886
29. de Sanjose S, Holme F. What is needed now for successful scale-up of screening? *Papillomavirus Res*. 2019;7:173. doi:10.1016/J.PVR.2019.04.011
30. Rodríguez-Feria P, Hernández-Flórez LJ, Rodríguez-Feria D. Knowledge, attitudes and practices of prevention for cervical cancer and breast cancer among medical students. *Rev Salud Publica*. 2016;18(3):354–366. doi:10.15446/RSAP.V18N3.44487
31. Altamimi T. Human papillomavirus and its vaccination: knowledge and attitudes among female university students in Saudi Arabia. *J Fam Med Prim Care*. 2020;9(4):1849. doi:10.4103/JFMPC.JFMPC_1205_19
32. Pandey D, Vanya V, Bhagat S, Shetty J, Shetty J. Awareness and attitude towards human papillomavirus (HPV) vaccine among medical students in a premier medical school in India. *PLoS One*. 2012;7(7):e40619. doi:10.1371/JOURNAL.PONE.0040619
33. Aga SS, Yasmeen N, Khan MA, Bahnasse A. Cervical cancer and its screening: assessing the knowledge, awareness, and perception among health and allied students. *Educ Res Int*. 2022;2022:1–17. doi:10.1155/2022/4608643
34. Mutyaba T, Mmiro FA, Weiderpass E. Knowledge, attitudes and practices on cervical cancer screening among the medical workers of Mulago Hospital, Uganda. *BMC Med Educ*. 2006;6:13. doi:10.1186/1472-6920-6-13

International Journal of Women's Health

Dovepress

Publish your work in this journal

The International Journal of Women's Health is an international, peer-reviewed open-access journal publishing original research, reports, editorials, reviews and commentaries on all aspects of women's healthcare including gynecology, obstetrics, and breast cancer. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/international-journal-of-womens-health-journal>