

Professional Readiness for Cervical Cancer Prevention among Female Nursing Students in Port Harcourt, Nigeria: Implications for Nursing Education and Career Development

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Abstract

Background

Preparing nursing students for professional practice requires the development of competencies, attitudes, and preventive health behaviours necessary for effective health promotion and disease prevention. Cervical cancer remains a major public health challenge in low- and middle-income countries, including Nigeria, where nurses play a critical role in promoting screening, vaccination, and health education. This study assessed indicators of professional readiness for cervical cancer prevention among female nursing students in Port Harcourt, Nigeria.

Methods

A cross-sectional study was conducted among 299 female nursing students enrolled in three accredited Bachelor of Nursing Science programmes in Port Harcourt, Nigeria. Data were collected using a structured questionnaire. Descriptive statistics were used to summarize participant characteristics and readiness indicators, with chi-square tests to assess associations between socio-demographic variables and knowledge levels.

Results

Awareness of cervical cancer screening was high, with 88.1% of respondents reporting prior awareness. Most participants demonstrated good knowledge of cervical cancer (71.6%) and correctly identified qualified screening providers (71.6%). Positive attitudes toward prevention were common, with 89.0% agreeing that screening helps prevent cervical cancer and 93.3% expressing willingness to undergo screening if it were free and safe. Indicators of cognitive readiness, including awareness, knowledge, and attitudes, were strong. In contrast, indicators of behavioural readiness were consistently poor. Only 19 (6.4%) respondents had ever undergone cervical cancer screening, 42 (14.0%) had received HPV vaccination, and 55 (18.4%) were aware of HPV vaccine availability within their institutions. Knowledge was significantly associated with age ($p = 0.001$) and academic level ($p < 0.001$). Cost, fear, and inadequate information were identified as important barriers to preventive service uptake.

Conclusions

Female nursing students demonstrated strong cognitive indicators of professional readiness for cervical cancer prevention. However, behavioural readiness remained inadequate, revealing a substantial knowledge-practice gap. Strengthening cervical cancer prevention content within nursing curricula, promoting experiential learning, and improving access to screening and vaccination services may

enhance professional readiness and better prepare future nurses to serve as effective health educators, screening advocates, and leaders in women's health promotion.

Introduction

The preparation of nursing students for professional practice extends beyond the acquisition of clinical knowledge and technical skills. It requires the development of competencies and professional behaviours that enable graduates to function effectively as health advocates, educators, and leaders within the healthcare systems.[1, 2]

As healthcare systems increasingly prioritize health promotion and disease prevention, nursing graduates are expected to possess the knowledge, confidence, and practical skills required to support evidence-based preventive interventions.[1, 2]

Professional readiness, the extent to which students possess the knowledge, skills, professional behaviours, and confidence required to assume professional responsibilities upon entry into practice, has emerged as an important outcome of contemporary nursing education and a key component of career development for future nurses.[1–3]

Cervical cancer remains a major global public health challenge and is one of the leading causes of cancer-related morbidity and mortality among women, particularly in low- and middle-income countries. [4] The World Health Organization (WHO) has identified cervical cancer elimination as a global public health priority and emphasizes the pivotal role of healthcare professionals in achieving screening and vaccination targets.[5]

Although largely preventable through human papillomavirus (HPV) vaccination, routine screening, and early treatment of precancerous lesions, the disease continues to impose a disproportionate burden on sub-Saharan Africa.[5, 6]

In Nigeria, cervical cancer is the second most common cancer among women,[6] with approximately 60.9 million women aged 15 years and above at risk of developing the disease.[7]

Nurses play a critical role in advancing cervical cancer prevention through patient education, risk communication, screening advocacy, vaccination promotion, and community-based health interventions, all of which are essential components of the global strategy for cervical cancer elimination.[5, 8] The effectiveness of nurses in these preventive roles is influenced by the extent to which they are adequately prepared during their formative years of training. Attitudes and preventive behaviours established during training may influence future professional practice and the effectiveness of health promotion activities delivered after graduation.[1–3]

In the context of this study, professional readiness for cervical cancer prevention is conceptualized as the combination of knowledge, attitudes, and personal preventive behaviours that underpin future nursing roles in health education, screening advocacy, and women's health promotion. Students who

demonstrate deficiencies in these domains may face challenges translating theoretical learning into effective preventive practice after graduation.[2, 3]

Studies from Nigeria suggest that nursing students and nurses generally possess moderate-to-high levels of awareness and knowledge regarding cervical cancer and its prevention; however, personal engagement with preventive services remains consistently low.[9–11] In a comparative cross-sectional study conducted among female nursing students at Delta State University Teaching Hospital and the University of Benin Teaching Hospital, Ibekwe et al. reported good knowledge levels of 66% and 59%, respectively, yet fewer than 10% of respondents had ever undergone cervical cancer screening.[9] Similarly, Ella et al. found that although 93.3% of female nursing students at the University of Calabar demonstrated good knowledge of cervical cancer, only 5% had been screened.[10] Among practicing nurses in Lagos, Awodele et al. observed widespread awareness of Pap smear screening but persistently low utilization.[11] Collectively, these findings reveal a persistent knowledge-practice gap and raise concerns about the professional readiness of future nurses to effectively promote cervical cancer prevention, screening uptake, and women's health advocacy in clinical and community settings.

Although previous studies have provided valuable insights into knowledge, attitudes, and preventive practices related to cervical cancer, most have been conducted within traditional knowledge-attitude-practice (KAP) frameworks. Consequently, limited attention has been paid to how these findings relate to broader issues of professional readiness, workforce preparation, and career development within nursing education. Examining cervical cancer prevention through a professional readiness lens may provide a more comprehensive understanding of how nursing students are prepared to fulfil future roles in health promotion, disease prevention, and women's health advocacy.

In Port Harcourt, Nigeria, cervical cancer remains an important women's health challenge, with reports indicating that many affected women present with advanced disease and limited prior exposure to screening services.[12]

Nurses are strategically positioned to address this burden through health education, screening advocacy, and community-based prevention initiatives. However, little is known about the extent to which nursing students in the region are professionally prepared for these future roles. To date, no multi-institutional study has examined indicators of professional readiness for cervical cancer prevention among female nursing students enrolled in accredited Bachelor of Nursing Science programmes in Port Harcourt, Nigeria. Addressing this gap is important for informing nursing education, workforce development strategies, and interventions aimed at strengthening the preventive health competencies of future nurses.

This study therefore sought to assess indicators of professional readiness for cervical cancer prevention among female nursing students in three accredited tertiary institutions in Port Harcourt, Nigeria. Specifically, the study evaluated students' knowledge, attitudes, and personal preventive practices related to cervical cancer prevention; examined barriers to screening uptake and awareness of institutional preventive health resources such as HPV vaccination services; and explored the relationship

between sociodemographic and educational characteristics and knowledge of cervical cancer prevention, a key indicator of professional readiness for future nursing roles in health promotion and disease prevention.

By positioning cervical cancer prevention within the broader context of nursing education, workforce preparation, and career development, this study extends beyond traditional KAP assessments and provides evidence that may inform curriculum enhancement, student support services, and institutional policies aimed at strengthening the professional readiness of future nurses to promote cervical cancer prevention, women's health, and preventive healthcare delivery.

Study Area: The study was conducted in three accredited tertiary nursing schools in Port Harcourt, Rivers State, Nigeria: The Department of Nursing Sciences, University of Port Harcourt; the Department of Nursing Sciences, Rivers State University; and the Department of Nursing Sciences, PAMO University of Medical Sciences.

Port Harcourt, the capital of Rivers State, is located in the oil-rich Niger Delta region and has an estimated population of 3.8 million in 2025, making it one of the fastest-growing urban centres in Nigeria.[13]

Study Design

This was a descriptive cross-sectional study.

Study Population: Female nursing students aged ≥ 18 years, enrolled in accredited Bachelor of Nursing Science (B.N.Sc) programs at universities in Port Harcourt, Rivers State.

Inclusion criteria

Female nursing students (≥ 18 years), currently enrolled in accredited B.N.Sc programs, who provided informed consent.

Exclusion criteria

100-level students, due to limited exposure to nursing curricula.

Sample Size Determination: The sample size was calculated using Cochran's formula for cross-sectional studies: $n = \frac{Z^2 pq}{d^2}$, Where n = Sample size; $Z = 1.96$ at 95% confidence, p = estimated proportion of female nursing students with adequate cervical cancer and prevention-related knowledge. In the absence of similar local studies involving three nursing schools, a prevalence of 50% was assumed to maximize sample size and avoid underestimation. $d = 0.05$ (margin of error), $q = 1 - p = 0.5$. A sample size estimate of 384 was used. Since the total population ($N = 928$) was $< 10,000$, finite population correction was applied: $n = n_0 / [1 + (n_0 - 1 / N)]$ giving an estimate of 272. Allowing 10% for non-response, the final sample size was **299**.

Sampling Method

A multistage sampling technique was used. Stage one involved proportionate allocation of sample size across the three nursing schools by female student population. Stage two applied proportionate sampling across level of study (200–500). Stage three selected participants by simple random sampling using random number generation from class lists. This minimized selection bias and ensured representativeness.

The proportionate allocation of respondents across institutions and academic levels is presented in Table 1.

Table 1
Proportionate allocation of respondents by institution and level

Institution	Total students	Sample allocated	200L	300L	400L	500L
University of Port Harcourt	460	148	31	38	62	16
Rivers State University	394	127	60	26	22	20
PAMO University of Medical Sciences	74	24	8	7	4	5
Total	928	299	99	71	88	41

Study Instrument

Data were collected using a structured, self-administered questionnaire adapted from two previously validated instruments used in studies assessing cervical cancer prevention-related knowledge, attitudes, and preventive practices among nursing students and other healthcare trainees.[14, 15] The questionnaire was reviewed by the research team to ensure its relevance to nursing students and the study objectives.

The instrument consisted of five sections:

Section A

Sociodemographic characteristics, including age, institution, year of study, marital status, sexual history, and family history of cervical cancer.

Section B

Awareness of cervical cancer and cervical cancer screening, including sources of information and exposure to cervical cancer prevention messages.

Section C: Knowledge of cervical cancer risk factors, symptoms, prevention, and screening methods (responses: Yes/No/Don't know).

Section D

Attitudes toward cervical cancer prevention and screening, assessed using a five-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree."

Section E

Preventive health behaviours and screening practices, including cervical cancer screening uptake, HPV vaccination status, awareness of institutional preventive health services, and perceived barriers to screening uptake.

For the purpose of this study, awareness, knowledge, attitudes, and personal preventive behaviours were examined as indicators of professional readiness for future nursing roles in cervical cancer prevention, health education, and screening advocacy.

The instrument was pretested among 32 female medical students at the University of Port Harcourt who were not included in the final study. Feedback obtained during the pretest was used to improve question clarity, eliminate ambiguities, and enhance the logical flow of the questionnaire.

Data Collection

Ethical approval

was obtained from the University of Port Harcourt Research Ethics Committee (UPH/CEREMAD/REC/MM111/002). Data were collected between April and May 2025 using a combination of paper-based and online (Google Forms) questionnaires to maximize participation and improve response rates among eligible students. Participation was voluntary, and informed consent was obtained from all respondents before questionnaire administration. Completed questionnaires were reviewed for completeness and consistency before data entry and analysis.

Data Analysis

Data were analyzed using IBM SPSS Statistics version 26. Descriptive statistics, including frequencies and percentages, were used to summarize respondents' sociodemographic characteristics, awareness of cervical cancer prevention, knowledge, attitudes, preventive health behaviours, and awareness of institutional preventive health resources. Knowledge scores were computed from 20 items (1 point for each correct answer; 0 for incorrect/ "don't know"), with total scores (0–20) categorized as poor (0–4), fair (5–10), or good (11–20). For the purpose of this study, awareness, knowledge, attitudes, and preventive health behaviours were examined as indicators of professional readiness for future nursing roles in cervical cancer prevention, health education, and health promotion. Chi-square was used to

determine associations between socio-demographics and knowledge levels, with significance set at $p < 0.05$.

Results

A total of 299 questionnaires were retrieved, giving a 100% response rate. Data were analyzed using SPSS version 26. Results were presented in tables.

The socio-demographic characteristics of respondents are presented in Table 2.

Table 2
Socio-demographic characteristics of respondents

Variable	Frequency n = 299	Percent
Age group		
≤ 20	153	51.2
21–25	137	45.8
26–30	8	2.7
> 30	1	0.3
Nursing School		
PAMO	24	8
RSU	128	42.8
UNIPORT	147	49.2
Year of study		
200	99	33.1
300	72	24.1
400	86	28.8
500	42	14
Marital Status		
Married	7	2.3
Divorce	1	0.3
Single	291	97.3
Religion		
Christian	294	98.3
Islam	3	1
Traditional	1	0.3
Number of Sexual Partners		
None	225	75.3
One	61	20.4
Two	6	2

Variable	Frequency n = 299	Percent
Age group		
More than two	7	2.3
Have relative diagnosed with cervical cancer		
Yes	17	5.7
No	282	94.3

Over half of the respondents 153 (51.2%) were aged ≤ 20 years. Majority were from the University of Port Harcourt 147 (49.2%), while 128 (42.8%) were from Rivers State University, and 24 (8%) from PAMO University. By level of study, the highest representation was from 200 level 99 (33.1%) and 400 level 86 (28.8%). Majority were single 291 (97.3%) and Christians 294 (98.3%). Only 17 (5.7%) reported a family history of cervical cancer and 13 (4.3%) had two or more sexual partners.

Awareness of cervical cancer, cervical cancer screening, and sources of information are presented in Table 3.

Table 3
Awareness and Sources of Information on Cervical Cancer and Screening

Variable	Frequency n = 200	Percent
Heard of Cervical Cancer		
Yes	286	95.7
No	13	4.3
Heard of cervical cancer screening n = 286		
Yes	252	88.1
No	34	11.9
Heard of pap smear for cervical cancer screening n = 252		
Yes	224	88.9
No	28	11.1
Sources of information of cervical cancer screening n = 252		
Internet	89	35.3
Nurse	38	15.1
Doctor	31	12.3
TV/Radio	28	11.1
School	25	9.9
Family	19	7.5
Friends	12	4.8
Hospital	7	2.8
Others	3	1.2

Awareness was high, with 286 (95.7%) having heard of cervical cancer and 252 (88.1%) aware of cervical cancer screening. The internet (35.3%) and nurses (15.1%) were the leading sources of information. Only 224 (88.9%) had heard of Pap smear as a screening method.

Respondents' knowledge of cervical cancer risk factors, symptoms, prevention, and screening methods is presented in Tables 4A-4C.

Table 4
A: Knowledge of Cervical Cancer among respondents

Variable	Frequency n = 299	Percent
Multiple sexual partners is a risk factor for cervical cancer		
Yes	236	78.9
No	31	10.4
Not sure	32	10.7
Early sexual intercourse is a risk factor		
Yes	179	59.9
No	68	22.7
Not sure	52	17.4
Infection with HPV is a risk factor		
Yes	237	79.3
No	24	8
Not sure	38	12.7
Infection with HIV is a risk factor		
Yes	165	55.2
No	67	22.4
Not sure	67	22.4
Cigarette smoking is a risk factor		
Yes	124	41.5
No	94	31.4
Not sure	81	27.1
Long term contraceptive use is a risk factor		
Yes	168	56.2
No	48	16
Not sure	83	27.8
Being a woman of reproductive age is a risk factor		
Yes	160	53.5

Variable	Frequency n = 299	Percent
Multiple sexual partners is a risk factor for cervical cancer		
No	38	12.7
Not sure	101	33.8

Table 4
B: Knowledge of Cervical Cancer Contd.

Variable	Frequency n = 299	Percent
Being over 50 years of age is a risk factor		
Yes	96	32.1
No	79	26.4
Not sure	124	41.5
Vaginal bleeding is a symptom		
Yes	198	66.2
No	32	10.7
Not sure	69	23.1
Foul-smelling vaginal discharge is a symptom		
Yes	209	69.9
No	39	13
Not sure	51	17.1
Bleeding during or after sexual intercourse is a sign		
Yes	205	68.6
No	23	7.7
Not sure	71	23.7
Avoiding multiple sexual partners can prevent cervical cancer		
Yes	266	89.0
No	10	3.3
Not sure	23	7.7
Avoiding sexual intercourse can help prevent cervical cancer		
Yes	213	71.2
No	35	11.7
Not sure	51	17.1
Screening and treatment can help prevent cervical cancer		
Yes	272	91

Variable	Frequency n = 299	Percent
Being over 50 years of age is a risk factor		
No	4	1.3
Not sure	23	7.7

Table 4
C: Knowledge of Cervical Cancer Contd

Variable	Frequency n = 299	Percent
Avoiding cigarette smoking can help prevent cervical cancer		
Yes	181	60.5
No	35	11.7
Not sure	83	27.8
Pap smear is a method of screening		
Yes	272	91.0
No	3	1.0
Not sure	24	8.0
Visual inspection of cervix is a method of screening		
Yes	237	79.3
No	17	5.7
Not sure	45	15.1
HPV/DNA testing is a method of screening		
Yes	211	70.6
No	21	7
Not sure	67	22.4
Liquid base cytology is a method of screening		
Yes	107	35.8
No	24	8
Not sure	168	56.2
There are available methods of screening		
Yes	171	57.2
No	29	9.7
Not sure	99	33.1
Summary of level of knowledge of cervical cancer		
Poor	9	3.0

Variable	Frequency n = 299	Percent
Avoiding cigarette smoking can help prevent cervical cancer		
Fair	76	25.4
Good	214	71.6

Tables 4A-C show that most respondents correctly identified key risk factors such as multiple sexual partners 236 (78.9%), early sexual intercourse 179 (59.9%), HPV infection 237 (79.3%), and HIV infection 165 (55.2%). Common symptoms, including vaginal bleeding 198 (66.2%), foul-smelling discharge 209 (69.9%), and post-coital bleeding 205 (68.6%), were also well identified. Preventive measures were also acknowledged, particularly screening and treatment 272 (91.0%) and avoiding multiple sexual partners 266 (89.0%). Awareness of screening methods was high for Pap smear 272 (91.0%), visual inspection of the cervix 237 (79.3%), and HPV/DNA testing 211 (70.6%), though only 107 (35.8%) recognized liquid-based cytology. Overall, 214 (71.6%) had good knowledge, 76 (25.4%) fair knowledge, and 9 (3.0%) poor knowledge.

Attitudes toward cervical cancer prevention and screening are presented in Table 5.

Table 5
Attitude towards cervical cancer and screening among respondents

Variable	Frequency n = 299	Percent
Any young woman can acquire cervical cancer		
Strongly Disagree	4	1.3
Disagree	12	4
Neutral	27	9
Agree	106	35.5
Strongly Agree	150	50.2
Screening helps in prevention of cancer of the cervix		
Strongly Disagree	2	0.7
Disagree	7	2.3
Neutral	24	8
Agree	78	26.1
Strongly Agree	188	62.9
Screening causes no harm to the client		
Strongly Disagree	6	2
Disagree	8	2.7
Neutral	34	11.4
Agree	82	27.4
Strongly Agree	169	56.5
Cervical cancer screening is not expensive		
Strongly Disagree	9	3
Disagree	44	14.7
Neutral	121	40.5
Agree	76	25.4
Strongly Agree	49	16.4
Would screen if is free and safe		
Strongly Disagree	1	0.3

Variable	Frequency n = 299	Percent
Any young woman can acquire cervical cancer		
Disagree	4	1.3
Neutral	15	5
Agree	65	21.7
Strongly Agree	214	71.6

Tables 5 shows that respondents had generally positive attitudes. Majority agreed that any young woman can acquire cervical cancer 256 (85.7%). Most respondents agreed that screening helps prevent cervical cancer 266 (89.0%), and 251 (83.9%) believed that it causes no harm to clients. However, perceptions about affordability varied, with 121 (40.5%) remaining neutral on whether screening is inexpensive. Importantly, willingness to screen was high, as 279 (93.3%) agreed that they would undergo screening if it were free and safe.

Preventive health behaviours, screening practices, HPV vaccination uptake, and perceived barriers to screening are presented in Table 6.

Table 6
Preventive Health Behaviours and Cervical Cancer Screening Practices

Variable	Frequency n = 299	Percent (%)
Undergone pap smear test		
Yes	19	6.4
No	280	93.6
Reasons for not undergoing pap smear test n = 280		
No reason	99	35.4
Not ready	5	1.8
Not enough information	94	33.6
Afraid of the test	34	12.1
it is expensive	36	12.9
Other reasons	12	4.3
HPV vaccination is available in the institution		
Yes	55	18.4
No	49	16.4
Don't know	195	65.2
Received HPV vaccine		
Yes	42	14
No	208	69.6
Don't know	49	16.4

Screening and vaccination uptake were very low. Only 19 (6.4%) respondents had ever undergone a Pap smear, and 42 (14.0%) reported receiving the HPV vaccine. Awareness of vaccine availability was also poor, with only 55 (18.4%) acknowledging its presence in their institutions. Reported barriers to Pap smear uptake included lack of information 94 (33.6%), no reason given 99 (35.4%), fear of the test 34 (12.1%), and cost 36 (12.9%). Furthermore, 214 (71.6%) respondents correctly identified doctors/trained nurses as qualified providers.

Key indicators of professional readiness for cervical cancer prevention are summarized in Table 7.

Table 7
Indicators of Professional Readiness for Cervical Cancer Prevention (n = 299)

Indicator	Frequency	Percent
Heard of cervical cancer screening	252	88.1
Good knowledge of cervical cancer prevention	214	71.6
Agreed that screening helps prevent cervical cancer	266	89.0
Would undergo screening if free and safe	279	93.3
Ever undergone Pap smear screening	19	6.4
Received HPV vaccination	42	14.0
Aware HPV vaccine is available within institution	55	18.4
Recognized qualified screening providers	214	71.6

Table 7 summarizes indicators of professional readiness for cervical cancer prevention among the respondents. Although awareness of screening (88.1%), good knowledge (71.6%), positive attitudes toward screening (89.0%), and willingness to screen if free and safe (93.3%) were high, actual preventive practices remained poor. Only 6.4% had undergone Pap smear screening, 14.0% had received HPV vaccination, and 18.4% were aware of HPV vaccine availability within their institutions.

Associations between socio-demographic characteristics and knowledge of cervical cancer are presented in Tables 8A-B.

Table 8
A: Socio-demographic Factors Associated with Knowledge of Cervical Cancer

Variable	Knowledge		X ² (P-value)
	Poor/Fair n(%)	Good n(%)	
Age group			
≤ 23	82(31.9)	175(68.1)	10.881(0.001)*
> 23	3(7.1)	39(92.9)	
Nursing school			
PAMO	9(37.5)	15(62.5)	1.245(0.537)
RSU	37(28.9)	91(71.1)	
UNIPORT	39(26.5)	108(73.5)	
Year of study			
≤ 300	65(38.0)	106(62.0)	18.031(< 0.001)*
> 300	20(15.6)	108(84.4)	
Marital			
Married	0(0.0)	7(100.0)	2.847(0.092)
Single/Divorced/	85(29.1)	207(70.9)	
Religion			
Christian	85(28.9)	209(71.1)	2.020(0.155)
Others	0(0.0)	5(100.0)	
Sexual partners			
None	14(23.0)	47(77.0)	3.822(0.148)
One	0(0.0)	6(100.0)	

Table 8
B: Socio-demographic Factors Associated with Knowledge of Cervical Cancer

Variable	Knowledge		X ² (P-value)
	Poor/Fair n(%)	Good n(%)	
Sexual partners			
None	14(23.0)	47(77.0)	3.822(0.148)
One	0(0.0)	6(100.0)	
More than one	71(30.6)	161(69.4)	
Have relative diagnosed of Cervical cancer			
Yes	3(17.6)	14(82.4)	1.030(0.310)
No	82(29.1)	200(70.9)	

*Statistical Significance

Chi-square analysis revealed significant associations between knowledge of cervical cancer and both age ($p = 0.001$) and year of study ($p < 0.001$). Respondents older than 23 years and those in higher levels (> 300 level) were more likely to demonstrate good knowledge. No significant associations were found with marital status, religion, number of sexual partners, or family history of cervical cancer.

Discussion

This study examined indicators of professional readiness for cervical cancer prevention among female nursing students enrolled in three accredited Bachelor of Nursing Science programmes in Port Harcourt, Nigeria. Overall, respondents demonstrated high awareness, generally good knowledge, and favourable attitudes toward cervical cancer prevention, but low uptake of cervical cancer screening and HPV vaccination. These findings suggest important gaps between cognitive preparedness and personal preventive health behaviour.

Professional readiness within nursing education extends beyond cognitive knowledge and encompasses the attitudes, experiences, and behaviours that shape future professional practice. In the context of cervical cancer prevention, readiness involves not only understanding risk factors, screening, and vaccination, but also demonstrating engagement with preventive health practices that may influence future patient education and advocacy efforts.[1–3]

The high level of awareness observed in this study is encouraging. Most respondents had heard of cervical cancer and cervical cancer screening, with the internet emerging as the most popular source of information, and to a lesser degree, school lectures. This aligns with the global trends, where nursing and

medical students are increasingly depending on digital platforms for health information.[16–19] This heavy reliance on non-curricular sources of information on cervical cancer and screening raises concerns about the depth and accuracy of knowledge acquired. While digital platforms can be powerful tools for disseminating health information, reliance on non-curricular sources may result in variable information quality and highlights the need for more structured and evidence-based learning opportunities within nursing curricula.

The majority of respondents demonstrated good knowledge of cervical cancer, particularly regarding major risk factors, symptoms, and commonly used screening methods. Knowledge levels in this study were comparable to findings reported among nursing students in Nigeria and other low- and middle-income countries.[9–11, 20] Nevertheless, important knowledge gaps were identified. Awareness of certain risk factors, including cigarette smoking, long-term contraceptive use, and older age, was suboptimal, while recognition of liquid-based cytology as a screening modality was particularly poor. Similar findings were reported among nursing students in Kuwait, who demonstrated good overall knowledge of cervical cancer but limited understanding of specific aspects of HPV transmission and prevention.[21] Likewise, a study among nurses at Lagos University Teaching Hospital found high awareness of the Pap smear test but poor knowledge of other cervical cancer screening modalities such as colposcopy.[11] These findings suggest that although foundational knowledge is being acquired, some aspects of cervical cancer and its prevention may not be receiving sufficient emphasis during undergraduate nursing training. Strengthening curricular content on comprehensive and updated teaching on cervical cancer and its various screening techniques in nursing schools, introduced at an earlier stage of the program may therefore enhance professional competence, improve preventive health literacy, and better prepare nursing students for future patient education and advocacy roles.

There was a significant association between knowledge and both age and academic level. Students in higher academic levels and older age groups demonstrated significantly better knowledge than their junior counterparts. Similar findings have been reported among nursing students in Kuwait, Iraq, and Saudi Arabia, where progression through nursing education was associated with improved knowledge of cervical cancer prevention.[21–23] This pattern supports the importance of structured educational exposure in developing competencies relevant to preventive healthcare. The findings further suggest that readiness for preventive health advocacy may develop progressively throughout nursing training, reinforcing the value of early and continuous integration of women's health topics within nursing curricula. In contrast, no significant associations were observed between knowledge and other socio-demographic characteristics, including marital status, religion, number of sexual partners, and family history of cervical cancer. This contrasts with findings from a study conducted among nursing students in Saudi Arabia, where significant correlations were reported between overall knowledge and both marital status and family history of cervical cancer.[23] The discrepancy may reflect the relatively homogeneous socio-demographic profile of the present study population, in which the majority of respondents were young, unmarried, and had no reported family history of cervical cancer.

Attitudes toward cervical cancer prevention were generally positive. Most respondents believed that screening is beneficial and indicated willingness to undergo screening if it were free and safe. Positive attitudes toward screening are important because attitudes influence future health promotion behaviours, patient education practices, and professional advocacy roles. Similar positive attitudes have been reported among nursing students in other Nigerian studies, including a comparative study conducted at Delta State University Teaching Hospital and the University of Benin Teaching Hospital, where the majority of respondents demonstrated favourable attitudes toward cervical cancer screening. [9] However, this finding contrasts with a study among nursing students at the University of Calabar, where a substantially lower proportion of respondents expressed positive attitudes toward screening. [10] Differences in educational exposure, institutional emphasis on preventive health, or contextual factors may account for this variation. Nevertheless, positive attitudes alone may be insufficient to translate into preventive behaviours when structural, financial, or psychosocial barriers remain unaddressed.

The most important finding from the perspective of professional readiness was the substantial gap between knowledge and personal preventive behaviour. Although awareness, knowledge, and attitudes were generally favourable, only a small proportion of respondents had ever undergone cervical cancer screening or received HPV vaccination. Similar discrepancies between knowledge and preventive practice have been reported among nursing students and healthcare workers in Nigeria and other low- and middle-income countries.[9, 10, 20, 21, 24, 25] This finding is particularly important because future nurses are expected to advocate for preventive services, counsel patients regarding screening, and support vaccination programmes. Students who have never personally engaged with these services may have fewer opportunities to develop experiential understanding, confidence, and professional commitment toward cervical cancer prevention. Furthermore, respondents identified barriers such as cost, fear, and inadequate information, while many reported no specific reason for non-participation. These findings suggest that knowledge alone may be insufficient to promote preventive health behaviours when structural and psychosocial barriers remain unaddressed. Addressing such barriers through affordable services, targeted health education, and supportive institutional interventions may strengthen both personal preventive practices and preparedness for future professional roles in cervical cancer prevention.

The professional readiness indicators derived from this study further reinforce these concerns. While most respondents demonstrated awareness of cervical cancer screening, good knowledge of prevention strategies, and generally positive attitudes toward screening, indicators reflecting actual engagement with preventive services were consistently poor. Uptake of HPV vaccination was low, and awareness of vaccine availability within institutional health services was limited. These findings suggest that opportunities for experiential learning and personal engagement with preventive health services may be underutilized within nursing training environments. Taken together, the findings indicate that professional readiness for cervical cancer prevention among nursing students is multidimensional. While cognitive readiness appears relatively strong, behavioural readiness remains inadequate. This distinction has important implications for nursing education and career development. Nursing programmes should

move beyond traditional knowledge-based approaches and adopt educational strategies that promote experiential learning, personal engagement with preventive health services, and professional identity formation. Such approaches may better equip future nurses to serve as effective health educators, advocates, and leaders in cervical cancer prevention, women's health promotion, and community-based disease prevention initiatives.

Conclusion

This study found that female nursing students in Port Harcourt demonstrated high awareness, generally good knowledge, and positive attitudes toward cervical cancer prevention. However, despite these favourable indicators, uptake of cervical cancer screening and HPV vaccination remained low. Significant associations between knowledge, age, and academic level further highlight the contribution of educational exposure to the development of preventive health competencies.

The findings suggest that professional readiness for cervical cancer prevention extends beyond knowledge acquisition and includes personal engagement with preventive health behaviours. While cognitive indicators of readiness were generally strong, behavioural indicators were comparatively weak, revealing a persistent knowledge-practice gap. Addressing this gap will require strengthened curricular content, earlier integration of cervical cancer prevention into nursing education, improved access to screening and vaccination services, and institutional strategies that promote experiential learning and preventive health engagement.

By framing cervical cancer prevention as a component of workforce preparation and career development, this study highlights opportunities for nursing education programmes to strengthen the readiness of future nurses to serve as effective health educators, screening advocates, and leaders in women's health promotion. Enhancing professional readiness in these areas may contribute to improved cervical cancer prevention efforts and broader public health outcomes.

Declarations

Ethics Approval and Consent to Participate

Ethical approval was obtained from the University of Port Harcourt Research Ethics Committee (UPH/CEREMAD/REC/MM111/002). Informed consent was obtained from all participants before enrollment in the study. All methods were carried out in accordance with relevant guidelines and regulations.

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Author Contributions

C.S.O. contributed to study conception and design, questionnaire design, data analysis, and manuscript drafting. E.G.O. and C.G.O. contributed to study design, data collection, and manuscript drafting. B.M.D., N.O., and M.O. contributed to study supervision, data interpretation, and critical revision of the manuscript. F.A. contributed to overall supervision, critical revision, and final approval of the work. All authors approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Competing Interests

The authors declare that they have no competing interests.

Availability of Data and Materials

The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

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