



Original Article

Assessing the Disconnect Between Cervical Cancer Knowledge and Perceived Willingness of Screening among Health Science Students in a Nigerian University

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Abstract:

Background: Cervical cancer remains a major public health concern in Nigeria despite being largely preventable through human papillomavirus (HPV) vaccination and regular cervical screening. Healthcare-related students are expected to possess adequate knowledge that may influence preventive health behaviors. This study assessed the knowledge and perceived willingness toward cervical cancer screening and prevention among female students in the Faculty of Basic Medical Sciences, Delta State University, Abraka.

Methods: A descriptive cross-sectional study was conducted among 180 female students selected from five departments within the Faculty of Basic Medical Sciences. Data were collected using a validated structured questionnaire (Cronbach's alpha = 0.86). Descriptive and inferential statistics were performed using SPSS version 25, with statistical significance set at $p < 0.05$.

Results: The majority of respondents demonstrated good knowledge of cervical cancer and its screening methods (97.3%). However, perceived willingness toward cervical cancer screening was suboptimal, with only 37.2% agreeing that screening is necessary for all female students. Important misconceptions were identified, as 69.4% believed that screening does not prevent cervical cancer, while 53.9% perceived that women in monogamous relationships do not require screening. There was no statistically significant association between knowledge level and perceived willingness toward cervical cancer screening (χ^2 , $p = 0.913$).

Conclusion: Although knowledge of cervical cancer screening was high among respondents, this did not translate into a positive perception of the need for screening. Persistent misconceptions regarding screening efficacy and perceived risk among women in monogamous relationships may hinder uptake of preventive services. Targeted health promotion interventions addressing psychosocial barriers and misconceptions are recommended to improve cervical cancer screening acceptance among female university students.

Keywords: Perceived willingness, Knowledge, Cervical cancer, HPV vaccination, Screening, Prevention, Undergraduate students.

1. Introduction

Cervical cancer is a malignant neoplasm of the cervix that arises primarily from persistent infection with high-risk human papillomavirus (HPV), particularly HPV types 16 and 18 [1–3]. The disease develops gradually through precancerous lesions known as cervical intraepithelial neoplasia, providing opportunities for prevention through HPV vaccination and early detection through screening. Although cervical cancer is largely preventable, it remains a significant public health problem, particularly in low- and middle-income countries (LMICs), where access to preventive and treatment services is often inadequate [3–5].

Globally, cervical cancer is the fourth most common cancer among women, accounting for approximately 660,000 new cases and 350,000 deaths in 2022 [3]. The burden is disproportionately concentrated in sub-Saharan Africa and other LMICs, where healthcare systems face challenges related to vaccination coverage, screening uptake, and timely treatment [4,5]. In Nigeria, cervical cancer remains one of the leading causes of cancer-related morbidity and mortality among women [6,7]. Despite increasing awareness campaigns, screening uptake remains low, and many cases are diagnosed at advanced stages, resulting in poor clinical outcomes [8–13].

To address this burden, the World Health Organization (WHO) launched the global strategy for the elimination of cervical cancer in 2020, targeting the achievement of the 90–70–90 goals by 2030. These targets aim for 90% HPV vaccination coverage among girls by age 15 years, 70% screening coverage among eligible women, and 90% treatment of women identified with cervical disease [14]. Successful implementation of these interventions has the potential to substantially reduce the incidence and mortality associated with cervical cancer worldwide [15,16]. However, several barriers continue to limit progress in many LMICs, including poor awareness, financial constraints, cultural beliefs, inadequate access to screening services, and misconceptions regarding cervical cancer prevention [3,9–13,20].

Screening remains a critical component of secondary prevention because it facilitates the early detection and treatment of precancerous lesions before progression to invasive disease. Conventional cytology (Pap smear) has contributed significantly to reducing cervical cancer incidence in high-income countries [21,22]. In resource-constrained settings, visual inspection with acetic acid (VIA) and visual inspection with Lugol's iodine (VILI) have been widely adopted because of their affordability and ease of implementation [23]. More recently, HPV DNA testing and self-sampling strategies have demonstrated considerable promise in improving

screening participation and expanding access to underserved populations [24–26]. Nevertheless, screening uptake remains suboptimal in many developing countries due to fear, stigma, low perceived susceptibility, inadequate knowledge, and limited access to healthcare services [9–13].

Several factors have been associated with the development and progression of cervical cancer, including early sexual debut, multiple sexual partners, smoking, HIV infection, long-term oral contraceptive use, high parity, and poor socioeconomic status [27–29]. While persistent infection with oncogenic HPV is a necessary cause of cervical cancer, these co-factors may increase the likelihood of viral persistence and progression to malignancy [30–33].

Previous studies conducted among women, healthcare workers, and university students in Nigeria have reported varying levels of knowledge and perceived willingness regarding cervical cancer screening. Although awareness of cervical cancer is generally increasing, misconceptions, low perceived risk, fear of diagnosis, cost implications, and cultural concerns continue to hinder screening uptake [9–13]. Furthermore, evidence suggests that adequate knowledge does not necessarily translate into positive screening attitudes or willingness to utilize preventive services [13].

Female students in health-related disciplines constitute an important population because they are future healthcare professionals who will play critical roles in health promotion, patient education, and advocacy for cervical cancer prevention. Their level of knowledge and perception of screening practices may influence future public health interventions and healthcare-seeking behaviors within the communities they serve. However, limited data exist regarding the relationship between cervical cancer knowledge and perceived willingness toward screening among female students in Delta State University, Abraka. Therefore, this study assessed the knowledge and perceived willingness toward cervical cancer screening and prevention among female students in the Faculty of Basic Medical Sciences, Delta State University, Abraka, Nigeria.

2. Materials & Methods

2.1 Study Design and Setting

This study employed a descriptive cross-sectional design to assess the knowledge and perceived willingness toward cervical cancer screening and prevention among female students in the Faculty of Basic Medical Sciences, Delta State University, Abraka, Nigeria. The Faculty comprises five departments: Anatomy, Medical

Biochemistry, Medical Physiology, Pharmacology, and Nursing Science. At the time of the study, the Faculty had an estimated population of 350 female students across the 200–500 academic levels, excluding students on clinical postings.

2.2 Study Population

The target population consisted of all female undergraduate students within the Faculty of Basic Medical Sciences. Female students were selected because cervical cancer is a disease that exclusively affects women and because the study sought to assess awareness and willingness toward cervical cancer screening among a population approaching the age range recommended for cervical cancer prevention and screening programs.

2.3 Sample Size Determination

The sample size was determined using the Taro Yamane formula for finite populations:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = required sample size

N = study population (350)

e = margin of error (0.05)

Substituting the values:

$$n = \frac{350}{1 + 350(0.05)^2}$$

$$n = \frac{350}{1 + 350(1.875)}$$

$$n = 186.7$$

A minimum sample size of 187 was obtained. However, 180 completed questionnaires were retrieved and included in the final analysis.

2.4 Sampling Technique

A stratified sampling technique was employed to ensure adequate representation of female students from all five departments. The number of participants selected from each department was proportionately allocated based on departmental student population. Eligible participants were subsequently selected using simple random sampling within each stratum.

2.5 Inclusion and Exclusion Criteria

2.5.1 Inclusion Criteria

Female undergraduate students in the Faculty of Basic Medical Sciences aged 18 years and above. Students who provided informed consent to participate in the study were included.

2.5.2 Exclusion Criteria

Male students and students absent during data collection as well as questionnaires with incomplete responses were excluded.

2.6 Instrument for Data Collection

Data were collected using a structured, self-administered questionnaire adapted from previously published studies on cervical cancer awareness and screening practices. The questionnaire consisted of four sections:

Section A: Socio-demographic characteristics.

Section B: Knowledge of cervical cancer and cervical cancer screening.

Section C: Perceived willingness toward cervical cancer screening.

Section D: Knowledge of cervical cancer prevention methods.

2.7 Validity and Reliability of the Instrument

The questionnaire was subjected to face and content validation by experts in public health and related biomedical disciplines to ensure clarity, relevance, and adequacy of the study items. Reliability was assessed using a test-retest approach among a group of respondents outside the study population. Internal consistency analysis yielded a Cronbach's alpha coefficient of 0.86, indicating good reliability. Scoring and Classification of Knowledge

Knowledge items were scored as follows:

Correct response = 1 point

Incorrect response = 0 points

Individual scores were summed and converted to percentages. Participants with scores of 70% or above were classified as having high knowledge, while those with scores below 70% were classified as having low knowledge.

2.8 Ethical Considerations

Ethical approval for the study was obtained from the Research Ethics Committee of the Faculty of Basic Medical Sciences, Delta State University, Abraka (Approval Number: RBC/FBMC/DELSU/24/582). Written informed consent was obtained from all participants prior to data collection. Participation was voluntary, and respondents were informed of their right to withdraw from the study at any stage without consequences. Confidentiality and anonymity were maintained throughout the study by excluding personal identifiers from the questionnaires and restricting access to study data.

2.9 Statistical Analysis

Data were coded, entered into Microsoft Excel, and subsequently analyzed using IBM Statistical Package for

the Social Sciences (SPSS) version 25. Descriptive statistics, including frequencies, percentages, tables, and charts, were used to summarize the data. Inferential

statistics were employed to assess associations between variables, with statistical significance set at $p < 0.05$.

3. Results

3.1 Sociodemographic Characteristics of the Participants

Table 1: Demographic Characteristics of Participants (n = 180)

Variables	Frequency	Percentage (%)
<i>Age (years)</i>		
18–22	57	31.7
23–27	110	61.1
28–32	10	5.6
>32	3	1.7
<i>Marital Status</i>		
Single	176	97.8
Married	4	2.2
<i>Religion</i>		
Christianity	180	100.0
<i>Department</i>		
Anatomy	26	14.4
Medical Biochemistry	31	17.2
Nursing	51	28.3
Pharmacology	50	27.8
Physiology	22	12.2
<i>Level of Study</i>		
200 Level	46	25.0
300 Level	46	25.0
400 Level	46	25.0
500 Level	46	25.0

3.2 Knowledge of cervical cancer screening among the Participants

Table 2: Knowledge of cervical cancer screening among the studied population (n=180)

Variables	Yes N(%)	No N(%)
Screening is necessary for early detection and prevention	158 (87.8)	22 (12.2)
Pap smear cytology and visual inspection are screening methods	153 (85.0)	27 (15.0)
Screening is recommended at regular interval according to established guidelines	139 (77.2)	41 (22.8)
All sexually active women should be screened	137 (76.1)	43 (23.9)
Primary prevention includes lifestyle changes and HPV vaccination	136 (75.6)	44 (24.4)
HPV testing identifies high-risk HPV types	177 (98.3)	3 (1.7)

Socio-Demographic Characteristics of Participants

A total of 180 female students participated in the study. The majority were aged 23–27 years (61.1%), while 31.7% were aged 18–22 years and 7.2% were older than 27 years. Most participants were single (97.8%), with only 2.2% being married. All respondents identified as Christians (100%). Participants were recruited from five departments within the Faculty of Basic Medical Sciences. Nursing Science had the highest representation (28.3%), followed by Pharmacology (27.8%), Medical Biochemistry (17.2%), Anatomy (14.4%), and Medical Physiology (12.2%). Equal representation was obtained across academic levels, with 25.0% of participants drawn from each of the 200, 300, 400, and 500 level classes (Table 1).

Knowledge of Cervical Cancer Screening and Prevention

Participants demonstrated a high level of knowledge regarding cervical cancer screening and prevention (Table 2). The majority (87.8%) correctly identified cervical cancer

screening as important for the early detection and prevention of cervical cancer, while 85.0% recognized Pap smear cytology and visual inspection methods as screening modalities. Furthermore, 76.1% indicated that all sexually active women should undergo cervical cancer screening, and 77.2% were aware that screening should be performed at recommended intervals in accordance with established guidelines. Knowledge of preventive measures, including lifestyle modification and HPV vaccination, was also relatively high, with 75.6% of participants providing correct responses. Notably, 98.3% of respondents reported that cervical cancer screening reveals the possibility of developing cervical cancer. Overall, the study revealed a high level of knowledge of cervical cancer screening among participants, with 97.3% classified as having good knowledge (Figure 1).

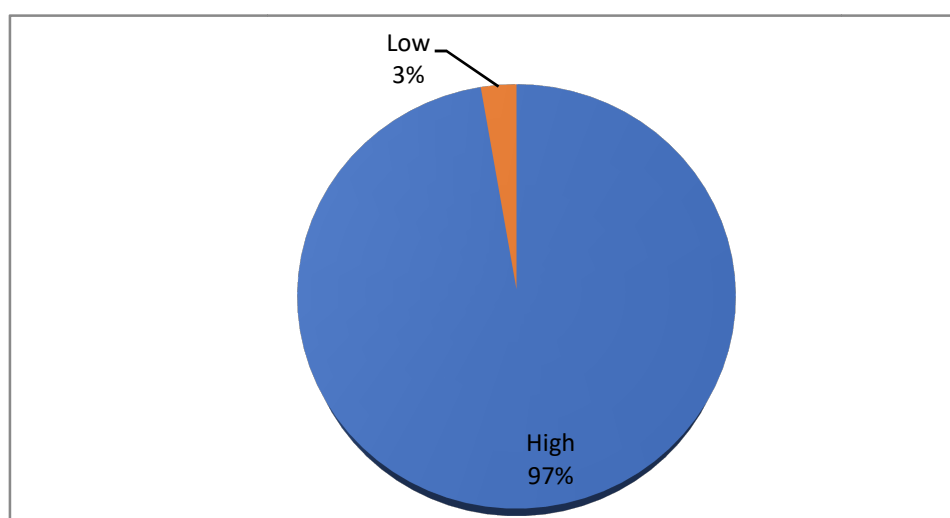


Figure 1: Level of cervical cancer screening Knowledge

Table 3: Perceived willingness of Cervical Cancer Screening among the studied population (n=180)

Variables	SD f(%)	D f(%)	A f(%)	SA f(%)
Screening is necessary for all female students	82 (45.6)	31 (17.2)	43 (23.9)	24 (13.3)
Girls should receive HPV vaccination before sexual debut	74 (41.1)	33 (18.3)	39 (21.7)	34 (18.9)
Screening does not prevent cancer or provide cure if detected early	24 (13.3)	31 (17.2)	63 (35.0)	62 (34.4)
Healthy individuals do not need screening	66 (36.7)	64 (35.6)	29 (16.1)	22 (11.7)
Individuals with one sexual partner do not need screening	41 (22.8)	34 (18.6)	56 (31.1)	49 (27.2)
Screening is not necessary at all	41 (22.8)	62 (34.4)	70 (38.9)	7 (3.9)

Perceived Willingness towards Cervical Cancer Screening

Participants demonstrated varying perceptions regarding cervical cancer screening and prevention (Table 3). A total of 37.2% of respondents agreed or strongly agreed that all female students should undergo cervical cancer screening, while the remaining respondents either disagreed, strongly disagreed, or were undecided. Similarly, 40.6% expressed willingness to receive HPV vaccination before sexual debut. Regarding perceptions of screening effectiveness, 69.4% of respondents agreed that cervical cancer screening does not prevent or cure cervical cancer.

In addition, 28.0% believed that healthy women do not require cervical cancer screening, while 53.9% indicated that women in monogamous relationships do not need screening. Conversely, 42.8% of participants disagreed with the statement that cervical cancer screening is unnecessary. Overall, the findings suggest variable perceptions toward cervical cancer screening and prevention among the study participants, despite the high level of knowledge observed.

Table 4: Methods of Prevention of Cervical Cancer among the studied population (n=180)

Variables	SD f(%)	D f(%)	A f(%)	SA f(%)
Getting vaccinated against HPV	7 (3.9)	0 (0.0)	87 (48.3)	86 (47.8)
Using condoms during sex	23 (12.8)	76 (42.3)	22 (12.2)	59 (32.8)
Having one sexual partner	13 (7.2)	42 (23.3)	100 (55.6)	25 (13.9)
Smoking cessation	11 (6.1)	37 (20.6)	70 (38.9)	62 (34.4)
Regular Pap smear examination	34 (18.9)	13 (7.2)	57 (31.7)	76 (42.2)
Limiting hormonal contraceptive use	20 (11.1)	0 (0.0)	73 (40.6)	87 (48.3)

Knowledge of Cervical Cancer Prevention Strategies

Participants demonstrated awareness of several cervical cancer prevention strategies (Table 4). The majority identified HPV vaccination (96.1%) as a preventive measure against cervical cancer. Other commonly recognized preventive strategies included limiting long-term hormonal contraceptive use (88.9%), regular cervical cancer screening using Pap smear testing (74.0%), smoking cessation (73.3%), and maintaining a single sexual partner (69.5%). Condom use was identified as a preventive strategy by 45.0% of respondents. Overall, the findings indicate a high level of awareness regarding cervical cancer prevention measures among the study participants, although differences were observed in the recognition of specific preventive strategies.

Association between knowledge and perceived willingness of cervical cancer screening

The association between knowledge of cervical cancer screening and perceived willingness toward cervical cancer screening was examined using the Chi-square test. Perceived willingness was operationally defined as recognition of the necessity of cervical cancer screening among female students. The analysis revealed no statistically significant association between knowledge level and perceived willingness toward cervical cancer screening ($p = 0.913$). This finding indicates that participants with higher knowledge levels were not significantly more likely to demonstrate positive perceived willingness toward cervical cancer screening than those with lower knowledge levels.

Table 5: Association between knowledge and perceived willingness of cervical cancer screening (n=180)

Knowledge Level	Perceived Willingness		p-value
	Yes f(%)	No f(%)	
High	65 (36.1)	110 (61.1)	0.913
Low	2 (1.1)	3 (1.7)	

4. Discussion

This study assessed the knowledge and perceived willingness toward cervical cancer screening and prevention among female students in the Faculty of Basic Medical Sciences, Delta State University, Abraka. The findings revealed a high level of knowledge regarding cervical cancer, screening methods, and preventive strategies among participants. Despite this high level of knowledge, perceived willingness toward cervical cancer screening was comparatively low, and no statistically

significant association was observed between knowledge level and perceived willingness toward screening ($p = 0.913$). These findings suggest that knowledge alone may not be sufficient to influence positive perceptions toward cervical cancer screening.

The high level of knowledge observed among participants may be attributed to their educational background as students in health-related disciplines. Most respondents correctly identified cervical cancer screening methods and recognized the importance of screening for early

detection. Similar findings have been reported among female university students and healthcare trainees in Nigeria, where awareness levels were generally high due to exposure to health-related information and academic training [9–13].

However, several responses indicated incomplete understanding of certain aspects of cervical cancer prevention. Although most participants recognized the importance of screening, many also expressed views that may limit acceptance of screening services. For example, a substantial proportion believed that women in monogamous relationships do not require cervical cancer screening. This finding may reflect low perceived susceptibility to cervical cancer despite adequate knowledge of the disease. Similar observations have been reported in previous Nigerian studies where perceived personal risk influenced willingness to participate in screening programmes [9–11].

The absence of a significant association between knowledge and perceived willingness is an important finding. This suggests that increasing knowledge alone may not necessarily improve acceptance of cervical cancer screening. Previous studies have similarly reported that willingness to participate in screening may be influenced by factors beyond knowledge, including perceived risk, cultural beliefs, fear of diagnosis, perceived benefits, accessibility of services, and personal attitudes toward screening procedures [10–13]. Since these factors were not directly measured in the present study, further investigation is warranted.

Participants demonstrated high awareness of HPV vaccination as a preventive strategy. Nevertheless, fewer respondents correctly identified the importance of vaccination before sexual debut. This finding highlights the need for greater emphasis on the timing and preventive purpose of HPV vaccination during health education programmes. Similar gaps in understanding of HPV vaccination have been reported among university students in other African settings [17,43].

Knowledge of other preventive measures, including smoking cessation, regular screening, and limitation of risk-related sexual behaviors, was generally high. However, awareness of condom use as a preventive strategy was comparatively lower. This finding suggests variation in the recognition of different cervical cancer prevention measures and underscores the need for

comprehensive educational approaches that address all aspects of prevention.

Overall, the findings indicate that while knowledge of cervical cancer and its prevention is high among female health science students, this knowledge does not necessarily translate into positive perceptions toward screening. Interventions aimed at improving screening acceptance should therefore extend beyond information dissemination and address factors that influence perceived susceptibility, perceived benefits, and willingness to utilize preventive services.

This study was limited by its cross-sectional design, which precludes causal inference. The study was conducted among students from a single faculty within one university, thereby limiting the generalizability of the findings. Data were self-reported and may be subject to recall and social desirability bias. Furthermore, factors such as perceived susceptibility, cultural beliefs, fear of diagnosis, accessibility of screening services, and previous screening experiences were not assessed and may have influenced participants' perceptions. Future studies should incorporate these variables and include more diverse populations.

5. Conclusion

Female students in the Faculty of Basic Medical Sciences demonstrated a high level of knowledge regarding cervical cancer screening and prevention. However, perceived willingness toward cervical cancer screening was comparatively low, and no significant association was observed between knowledge level and perceived willingness. These findings suggest that knowledge alone may be insufficient to influence positive perceptions toward cervical cancer screening. Strategies aimed at improving screening acceptance should therefore combine educational interventions with approaches that address perceptions, beliefs, and barriers to preventive health service utilization. Health education programmes should emphasize the purpose, benefits, and recommended timing of cervical cancer screening and HPV vaccination. Universities should collaborate with healthcare providers to organize periodic cervical cancer awareness campaigns and screening outreaches. Student-focused interventions should address misconceptions relating to perceived risk and eligibility for cervical cancer screening.

Declarations

Consent for publication: All authors approved the publication of this manuscript.

Data availability statement: The Authors sincerely thank the participants and the faculty members of the Faculty of Basic Medical Sciences, Delta State University, for their cooperation and participation in this study. We also acknowledge the Research Ethics Committee of the University, for granting permission to conduct this study.

Competing Interests: The authors declare that they have no conflicts of interest.

Authors' Contributions: D.B., J.U.F., H.E. and O.B. conceptualized the study, designed the methodology, conducted interviews, performed data analysis, and drafted the manuscript. A.I.O.D., S.N.I. and J.N.E. contributed to data coding, interpretation, and critical revision of the final manuscript. D.B., I.U.K, O.F.J. A.O drafted the final Manuscript. All authors reviewed and approved the final version of the manuscript.

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