



Assessment of Knowledge and Screening Practices for Cervical Cancer Among Female Students in Taraba State College of Technology, Takum, Nigeria

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Abstract

Background: Cervical cancer remains a leading cause of cancer-related mortality among women in low- and middle-income countries. Despite growing theoretical awareness, actual screening uptake among young women in Nigeria remains suboptimal. This study assessed the level of knowledge and screening practices for cervical cancer among female students at the Taraba State College of Technology, Takum, Nigeria.

Methods: A facility-based descriptive cross-sectional study was conducted among 414 female students selected via a multistage sampling technique. Data were collected using a structured, self-administered questionnaire and analyzed using SPSS version 23. Descriptive statistics, Chi-square tests, and binary logistic regression were employed to determine associations and predictors of knowledge and screening uptake.

Results: The cohort was predominantly aged 18–22 years (76.1%), with 77.5% reporting sexual activity. While 85.5% demonstrated good overall knowledge (score $\geq 50\%$) and correctly identified HPV as the primary etiology (72.9%), significant misconceptions persisted regarding screening guidelines and procedural pain (63.5%). Crucially, actual screening uptake was critically low at 20.8%, despite a high expressed willingness to screen in the future (86.7%). Binary logistic regression revealed that receiving formal health education (aOR = 2.38, $p = 0.004$) and obtaining information from formal sources (aOR = 2.41, $p = 0.002$) significantly predicted good knowledge. For screening uptake, being sexually active (aOR = 2.14, $p = 0.021$), perceived susceptibility (aOR = 1.87, $p = 0.026$), and advice from a health professional (aOR = 2.63, $p = 0.002$) were positive predictors, whereas perceiving cost as a barrier significantly reduced the odds of screening (aOR = 0.58, $p = 0.047$).

Conclusion: A profound knowledge-practice gap exists among female students in this setting. High baseline awareness does not translate to screening uptake due to modifiable structural, systemic, and perceptual barriers. Effective interventions must transcend basic awareness campaigns to include subsidized on-campus screening, enhanced provider-patient counseling, and targeted myth-debunking to translate knowledge into life-saving preventive action.

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Background of the Study

Cervical cancer persists as a critical global public health challenge, ranking as the fourth most prevalent malignancy among women worldwide. In 2020, it accounted for approximately 604,000 new diagnoses and 342,000 fatalities, with low- and middle-income countries (LMICs) bearing a disproportionate share of this burden due to inadequate access to preventive healthcare [1]. The disease is primarily driven by persistent infection with high-risk strains of the human papillomavirus (HPV), making it highly preventable through targeted vaccination and routine screening [2]. Although diagnostic modalities such as the Papanicolaou (Pap) smear, visual inspection with acetic acid (VIA), and HPV DNA testing effectively identify precancerous lesions to mitigate morbidity and mortality, their utilization remains suboptimal in developing nations [3]. In Nigeria, cervical cancer is the second most common cancer and a primary cause of cancer-related mortality among reproductive-aged women, with annual estimates exceeding 12,000 new cases and 8,000 deaths [4]. While baseline awareness of the disease exists among Nigerian women, comprehensive understanding of its risk factors, symptomatology, and screening protocols remains deficient, resulting in remarkably low screening adherence [5,6]. Female undergraduates represent a vital demographic for preventive interventions; despite being within the sexually active age bracket and susceptible to HPV, they frequently underestimate their personal risk. Consequently, a stark disconnect persists between theoretical awareness and actual screening behavior in this cohort [7,8]. Currently, there is a distinct lack of empirical data regarding cervical cancer knowledge and screening behaviors among female students at the Taraba State College of Health Technology, Takum. Evaluating this demographic is crucial for identifying specific informational gaps and

systemic barriers, thereby generating evidence to guide localized health education and policy interventions.

Statement of the Problem

Despite being largely preventable, cervical cancer continues to exact a heavy toll on women in Nigeria, ranking as the second leading cause of cancer-related deaths in women aged 15–44 years [1,9]. National data indicate roughly 12,075 annual diagnoses and 7,968 associated deaths, highlighting a mortality rate that could be significantly reduced through timely screening [10]. The core problem lies in the profound disparity between disease preventability and healthcare utilization. Research among Nigerian female undergraduates consistently reveals that high awareness does not translate to screening uptake. For instance, studies have shown that while awareness levels may exceed 70–85%, actual screening rates remain critically low (often below 16%), hindered by factors such as financial constraints, asymptomatic presentation, and fear of diagnosis [9,11]. Studies among female undergraduates in Nigeria indicate that although a substantial proportion of students may be aware of cervical cancer, actual screening practices are poor. For example, a study among female university students found that while 72.1% were aware of cervical cancer, only 16.1% had ever undergone a Pap smear test, and many had poor overall knowledge of the disease [11]. Similarly, research in another Nigerian tertiary institution reported that although 85.6% of respondents were aware of cervical cancer, only 7.2% had ever been screened, with cost and lack of symptoms cited as major barriers [9].

This lack of proactive health-seeking behavior among young women elevates their risk for late-stage disease presentation and poor prognostic outcomes [12]. Given the absence of institution-specific data for the Taraba

State College of Technology, Takum, public health stakeholders lack the empirical foundation necessary to design effective, targeted interventions. Without such data, the cycle of low screening uptake and preventable mortality within this vulnerable population is likely to persist.

Justification of the Study

This research is necessitated by the paradoxical coexistence of high disease preventability and persistent mortality rates among Nigerian women. Female students in tertiary institutions constitute a strategic demographic for public health intervention, as they are within the prime reproductive age group and are highly receptive to campus-based health education. However, existing literature indicates that screening uptake in this group frequently falls below 20%, driven by inadequate comprehensive knowledge and systemic barriers [8,11]. In Taraba State, particularly within Takum, the absence of localized data impedes the ability of health authorities and academic administrators to formulate context-specific cervical cancer prevention strategies. By investigating the knowledge, attitudes, and practices of students at the Taraba State College of Technology, this study will bridge a critical empirical gap. The findings will equip policymakers, non-governmental organizations, and health educators with actionable data to develop campus-wide awareness campaigns, integrate reproductive health into student welfare services, and advocate for accessible screening. Ultimately, this research supports Nigeria's alignment with the WHO's global strategy to eliminate cervical cancer as a public health threat.

General Objective

To evaluate the level of knowledge and the prevalence of cervical cancer screening practices among female students at the Taraba State College of Technology, Takum.

Specific Objectives

1. To ascertain the baseline level of knowledge regarding cervical cancer (including etiology, risk factors, and symptoms) among Female students.
2. To evaluate the students' awareness and understanding of available cervical cancer screening modalities.
3. To determine the proportion of female students

who have previously undergone cervical cancer screening.

4. To identify the socio-demographic and institutional factors that influence screening behaviors.
5. To explore the perceived barriers hindering the utilization of cervical cancer screening services among female students.

Methodology

Study Design: A descriptive cross-sectional study design was utilized for this research. This approach is highly appropriate as it facilitates the simultaneous evaluation of cervical cancer knowledge and screening behaviors within the target demographic at a specific temporal point, without the manipulation of independent variables.

Study Area: The research was conducted at the Taraba State College of Technology, located in Takum Local Government Area (LGA) of Taraba State, North-Eastern Nigeria. Takum LGA features a blend of rural and semi-urban communities characterized by diverse socio-cultural and religious demographics, with agrarian, commercial, and civil service activities predominating among the residents.

Established in 1997 by the State Government, the College is mandated to deliver technical, vocational, and professional education to foster manpower development. It offers National Diploma (ND) and Higher National Diploma (HND) programs across various science and technology disciplines. Over the years, the institution has attracted a heterogeneous student population drawn from Taraba and neighboring states. The campus is equipped with comprehensive academic and social infrastructure, including digital and physical libraries, a functional campus health clinic, lecture theaters, laboratories, and residential hostels. The presence of a substantial female student population within the reproductive age bracket, coupled with accessible health and academic facilities, renders the institution an optimal and feasible setting for investigating reproductive health awareness and preventive practices.

Study Population: The target population for this study comprised all officially registered female students enrolled at the Taraba State College of Technology, Takum, during the active data collection period.

Sample Size Determination

The sample size was determined using the conventional Kish formula. A prevalence of 57% was obtained from previous studies, with a 95% confidence level and a 5% margin of error.

Kish Sample Size Formula

$$n = \frac{Z^2 p q}{d^2}$$

Where:

- n = minimum sample size
- Z = standard normal deviate at 95% confidence level = 1.96
- p = estimated prevalence from previous studies = 57% = 0.57
- $q = 1 - p = 1 - 0.57 = 0.43$
- d = margin of error (precision) = 5% = 0.05

Substitute the values

$$n = \frac{(1.96)^2 \times 0.57 \times 0.43}{(0.05)^2}$$

Step-by-step:

- $1.96^2 = 3.84$
- $0.57 \times 0.43 = 0.2451$
- Numerator = $3.84 \times 0.2451 = 0.941$
- Denominator = $0.05^2 = 0.0025$

$$n = \frac{0.941}{0.0025} = 376.4$$

Minimum Sample Size

$$n \approx 376$$

Adjustment for non-response (10%)

$$n_{adjusted} = \frac{376}{1 - 0.10} = \frac{376}{0.9} = 417.8$$

The calculated minimum sample size was 376. After adjusting for a 10% non-response rate, a final sample size of **418** respondents was obtained.

Sampling Technique A multistage sampling procedure was employed to select the participants. In the first stage, simple random sampling was utilized to select specific academic departments within the college. In the second stage, the required sample size was proportionally allocated across the chosen departments

based on their respective female student populations to ensure equitable representation. Finally, systematic random sampling (or simple random sampling, where applicable) was applied to select individual female students within each department.

Inclusion and Exclusion Criteria

- **Inclusion Criteria:** Participation was restricted to officially registered female students of the institution who were present on campus during the data collection phase and who provided voluntary informed consent.
- **Exclusion Criteria:** The study excluded male students, unregistered individuals, and female students who were absent during the fieldwork (e.g., those on industrial attachment or practical training). Additionally, students who declined to provide informed consent were excluded from the study.

Research Instrument Primary data were gathered using a structured, self-administered questionnaire designed by the researcher following an extensive review of relevant literature. The instrument was systematically divided into distinct sections capturing:

1. Socio-demographic characteristics.
2. Baseline knowledge of cervical cancer.
3. Awareness of specific screening modalities.
4. Actual screening practices.
5. Perceived barriers to cervical cancer screening.

Validity of the Instrument To ensure construct validity, the draft questionnaire underwent rigorous face and content validation. Subject matter experts in public health and research methodology critically reviewed the instrument for clarity, relevance, and comprehensiveness in addressing the study's objectives. Necessary modifications and refinements were incorporated based on their expert recommendations.

Reliability of the Instrument To ascertain reliability, a pre-test was administered to female students at a comparable tertiary institution outside the primary study area. The internal consistency of the instrument was evaluated using Cronbach's alpha coefficient, with a reliability threshold of ≥ 0.70 deemed acceptable for the study.

Method of Data Collection The researcher, supported by a team of trained research assistants, administered the questionnaires directly to the respondents. To maximize the response rate and minimize data loss, the instruments were distributed and retrieved either on the same day or within a mutually agreed-upon timeframe.

Method of Data Analysis Upon collection, the returned questionnaires were meticulously screened for completeness and accuracy. The validated data were subsequently coded and analyzed using the Statistical Package for the Social Sciences (SPSS) version 23 (or a more recent iteration). Descriptive statistical methods, including frequencies, percentages, means, and charts, were employed to summarize the data. The analytical outputs were systematically presented using frequency tables and figures for clear interpretation.

Ethical and Administrative Considerations Strict ethical protocols were observed throughout the research process. Formal ethical clearance was obtained from the relevant institutional research ethics committee, and administrative permission was granted by the management of the Taraba State College of Technology, Takum. The purpose of the study was clearly explained to all potential participants, and informed consent was secured prior to the administration of the questionnaire. Participation was entirely voluntary, and respondents were assured of the strict confidentiality and anonymity of their provided information.

Data Analysis and Result

Socio-Demographic Information

Table 1: Socio-Demographic Information

Items	Age in years	Frequency	percentage
Age of the respondents	18 - 22 years	315	76.1
	23 - 27	77	18.6
	28 - 32	17	4.1
	33 above	5	1.2
Program of study	ND	382	92.3
	HND	11	2.7
	B.Sc.	21	5.1
Department	Community Health	130	31.4
	Pharmacy	18	4.3
	Dental Therapy	15	3.6
	Public Health	79	19.1
	Health Education ad Promotion	57	13.8
	Radiography	24	5.8
	Optic	5	1.2
	Epidemiology and Disease Control	22	5.3
	Medical Laboratory	33	8
	Health Information Management	4	1
	Environmental Health	20	4.8
	nutrition and Dietetics	7	1.7

The socio-demographic profile of the participants is detailed in Table 1. The study population was predominantly youthful, with over three-quarters of the respondents (76.1%) falling within the 18–22 years age bracket. The proportion of participants decreased progressively with age, comprising 18.6% in the 23–27 years category, 4.1% in the 28–32 years bracket, and a mere 1.2% aged 33 years and older. This distribution confirms that the cohort

primarily consisted of young adults. Academically, the respondents were heavily skewed toward the National Diploma (ND) program, which accounted for the vast majority of the sample (92.3%). Students enrolled in the Bachelor of Science (B.Sc.) and Higher National Diploma (HND) programs constituted a small minority, representing 5.1% and 2.7% of the participants, respectively. Regarding departmental distribution, Community Health recorded the highest representation (31.4%), followed by Public Health (19.1%) and Health Education and Promotion (13.8%). Moderate participation was observed across several other disciplines, including Medical Laboratory (8.0%), Radiography (5.8%), Epidemiology and Disease Control (5.3%), Environmental Health (4.8%), and Pharmacy (4.3%). The smallest proportions of respondents were drawn from Nutrition and Dietetics (1.7%), Optometry (1.2%), and Health Information Management (1.0%).

Preliminary Questions

Table 2: preliminary Questions

Items	Responses	Frequency	percentage
Are you sexually active?	No	93	22.5
	Yes	321	77.5
Have you ever received any health education on cervical cancer?	No	235	57
	Yes	178	43
Source of information about cervical cancer	social media	88	21.3
	school lectures	187	45.2
	health professionals	125	30.2
	Friends/peers	12	2.9
	Family members	2	0.5
Have you heard of cervical cancer before?	No	111	26.8
	Yes	298	73.2

Table 2 details the sexual and educational background of the respondents. A significant majority of the participants (77.5%) reported being sexually active, while the remaining 22.5% were not. Furthermore, the data reveals a notable gap in formal health education; more than half of the respondents (57.0%) stated they had never received any health education concerning cervical cancer, whereas 43.0% had been exposed to such information. An analysis of the respondents' information channels revealed that formal academic settings were the primary conduit for knowledge. Specifically, school lectures were identified as the leading source of information (45.2%), followed by consultations with health professionals (30.2%) and social media platforms (21.3%). Conversely, informal interpersonal networks contributed minimally, with friends or peers (2.9%) and family members (0.5%) representing the least utilized sources. Regarding general awareness of the disease, a substantial proportion of the female students (73.2%) confirmed having prior knowledge of cervical cancer, while over a quarter (26.8%) reported never having heard of it.

Knowledge of Cervical Cancer

Table 3: Knowledge of Cervical Cancer

Items	Responses	Frequency	Percentage
Cervical cancer affects which part of the female reproductive system?	Ovary	35	8.5
	Cervix	256	61.8
	uterus	45	10.9
	Vagina	78	18.8

Which virus is the main cause of cervical cancer?	HIV	33	8
	HPV	302	72.9
	Hepatitis B Virus	34	8.2
	Influenza Virus	45	10.9
Cervical Cancer is Preventable	No	33	8
	Yes	381	92
Early sexual activity can increase the risk of cervical cancer	No	38	9.2
	Yes	376	90.8
Having multiple sexual partners can increase the risk of cervical cancer	No	25	6
	Yes	389	94
Smoking increases the risk of cervical cancer	No	97	23.4
	Yes	317	76.6
Symptoms of cervical cancer may include	Abnormal vaginal bleeding	94	22.7
	Pain during sexual intercourse	67	16.2
	Pelvic pain	21	5.1
	All of the above	232	56
Cervical cancer is common among women of which age group	15-24 years	170	41.1
	25-64 years	116	28
	65-80 years	16	3.9
	All ages	112	27.1
Cervical cancer can lead to death if not detected early	No	15	3.6
	Yes	399	96.4
Regular screening can help detect cervical cancer before symptoms appear	No	28	6.8
	Yes	385	93.2

Table 3 shows that a majority of respondents (61.8%) correctly identified the cervix as the anatomical site affected by cervical cancer, although some incorrectly attributed the disease to the vagina (18.8%), uterus (10.9%), or ovary (8.5%). Most participants (72.9%) recognized Human Papillomavirus (HPV) as the primary cause of cervical cancer. Knowledge regarding prevention and risk factors was generally high, with 92.0% acknowledging that cervical cancer is preventable, 90.8% identifying early sexual debut as a risk factor, 94.0% recognizing multiple sexual partners as a risk factor, and 76.6% associating smoking with increased risk. More than half of the respondents (56.0%) correctly identified all listed symptoms of cervical cancer. However, knowledge regarding the age group most affected was variable, as 41.1% selected 15–24 years, whereas only 28.0% correctly identified 25–64 years. Furthermore, almost all respondents agreed that untreated cervical cancer can be fatal (96.4%) and emphasized the importance of regular screening for early detection (93.2%).

Knowledge of Cervical Cancer Screening Methods

Table 4: Knowledge of Cervical Cancer Screening Methods

Items	Responses	Frequency	Percentage
Have you heard of the Pap smear test?	No	256	61.8
	Yes	158	38.2
Have you heard of visual inspection with Acetic Acid (VIA)?	No	310	74.9
	Yes	104	25.1
HPV DNA testing can detect cervical cancer	No	59	14.3
	Yes	355	85.7
screening should begin at what age for women at risk	15 years	266	64.3
	21 years	91	22
	30 years	37	8.9
	40 years	20	4.8
How often should cervical cancer screening be done for sexually active women?	Every 6 months	245	59.2
	Every 3 years	93	22.5
	Every 5 years	20	4.8
	Only when symptomatic	56	13.5
cervical cancer screening can prevent cancer	No	73	17.6
	Yes	341	82.4
Which of the following can be used for cervical cancer screening	Pap smear	73	17.6
	VIA	22	5.3
	HPV DNA test	177	42.8
	All of the above	142	34.3
Screening is necessary even if a woman feels healthy	No	23	5.6
	Yes	391	94.4
Who can perform cervical cancer screening	Trained health professional only	370	89.4
	Family members	14	3.4
	Friends	4	1
	Anyone	26	6.3
Screening for cervical cancer is usually painful	No	151	36.5
	Yes	263	63.5

The results in Table 4 show that awareness of screening methods was relatively low as 61.8% had not heard of the Pap smear test and 74.9% were unaware of Visual Inspection with Acetic Acid (VIA), although 85.7% knew that HPV DNA testing can detect cervical cancer; most respondents (64.3%) incorrectly believed screening should begin at 15 years, while only 22.0% selected 21 years, and 59.2% incorrectly believed screening should be done every six months, while only 22.5% selected the correct interval of every three years; however, 82.4% agreed that screening can prevent cervical cancer and 94.4% believed screening is necessary even when a woman feels healthy, while 89.4% correctly indicated that screening should be performed by trained health professionals, although 63.5% believed screening is painful.

Screening Practices

Table 5: Screening Practices

Items	Responses	Frequency	Percentage
Have you ever undergone cervical cancer screening?	No	328	79.2
	Yes	86	20.8
If yes, what type of screening did you undergo?	Pap smear	27	6.5
	VIA	15	3.6
	HPV DNA test	50	12.1
	I don't know	322	77.8
How many times have you undergone screening?	Once	66	15.9
	Twice	17	4.1
	More than twice	16	3.9
	Never	315	76.1
When was your last cervical cancer screening?	within the past year	57	13.8
	1-2 years ago,	26	6.3
	More than 2 years ago	18	4.3
	None	313	75.6
Do you plan to go for screening in the future?	No	55	13.3
	Yes	359	86.7
Who encourage you or advice you to go for screening?	Health worker	289	69.8
	Family member	12	2.9
	Friend	6	1.4
	Self-motivated	107	25.8
Where did you go for screening	Hospital/Clinic	322	77.8
	School health center	65	15.7
	Others	27	6.5
How often do you attend general medical check-ups?	Regularly	158	38.2
	Occasionally	107	25.8
	Rarely	149	36
Have you ever received counselling about cervical cancer before screening?	No	221	53.4
	Yes	193	46.6
Are you satisfied with the screening experience?	No	186	44.9
	Yes	228	55.1

The findings in Table 5 indicate poor screening practices, as the majority (79.2%) had never undergone cervical cancer screening, while only 20.8% had. Among those screened, HPV DNA testing (12.1%) was most reported, followed by Pap smear (6.5%) and VIA (3.6%), although most respondents (77.8%) did not know the type of screening they received; most respondents (76.1%) had never undergone screening and 75.6% had never had any screening at all, however, a large proportion (86.7%) expressed willingness to go for screening in the future; health workers were the main source of encouragement (69.8%), followed by self-motivation (25.8%), and most screenings were conducted in hospitals or clinics (77.8%). In comparison, 38.2% attended medical check-ups regularly, 25.8% occasionally, and 36.0% rarely, and more than half (53.4%) had not received counselling before screening, although 55.1% reported satisfaction with the screening experience.

Factors Influencing Screening Practices

Table 6: Factors Influencing Screening Practices

Items	SD	D	N	A	SA
I believe I am at risk of developing cervical cancer	54 (13.0)	72 (17.4)	35 (8.5)	130 (31.4)	123 (29.7)
My level of knowledge influences my decision to undergo screening	17 (4.1)	53 (12.8)	22 (5.3)	201 (48.6)	121 (29.2)
Family support affects my decision to get screened	40 (9.7)	100 (24.2)	46 (11.1)	135 (32.6)	93 (22.5)
Peer influence affects my decision to get screened	45 (10.9)	107 (25.8)	45 (10.9)	144 (34.8)	72 (17.4)
Cultural or religious beliefs influence my decision to screen	46 (11.1)	89 (21.5)	34 (8.2)	143 (34.5)	102 (24.6)
Fear of a positive result influence my decision to screen	52 (12.6)	79 (19.1)	36 (8.7)	147 (35.5)	100 (24.2)
The cost of screening affects my decision to go for screening	25 (6.0)	81 (19.8)	47 (11.4)	162 (39.1)	99 (23.9)
Accessibility of health facilities influences my decision to get screened	28 (6.8)	67 (16.2)	44 (10.6)	181 (43.7)	94 (22.7)
Advice from a health professional influence my screening practices	27 (6.5)	56 (13.5)	31 (7.5)	193 (46.6)	107 (25.8)
Media (TV, social media, Radio, etc.) influences my knowledge or decision to screen	40 (9.7)	46 (11.1)	45 (10.9)	175 (42.3)	108 (26.10)

The findings in Table 6 show that perception of risk influences screening practices as 61.1% of respondents agreed or strongly agreed that they are at risk of developing cervical cancer, and 77.8% agreed that knowledge influences their decision to undergo screening, while family support (55.1%) and peer influence (52.2%) also played important roles; cultural and religious beliefs influenced decisions for 59.1% of respondents, while fear of a positive result (59.7%) and cost of screening (63.0%) were major influencing factors, and accessibility of health facilities (66.4%) and advice from health professionals (72.4%) significantly affected screening practices. In comparison, media influence was reported by 68.4% of respondents.

Barriers to Utilization of Screening Services

Table 7: Barriers to Utilization of Screening Services

Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Screening services are expensive	35 (8.5)	58 (14.0)	38 (9.2)	179 (43.20)	104 (25.1)
I do not know where to access cervical cancer screening services	26 (6.3)	92 (22.2)	49 (11.8)	155 (37.4)	92 (22.2)
I am afraid of the screening procedure	33 (8.0)	92 (22.2)	48 (11.6)	154 (37.2)	87 (21.0)

Embarrassment prevents me from going for a screening	59 (14.3)	102 (24.6)	28 (6.8)	133 (32.1)	92 (22.2)
Culture and norms discourage women from screening	36 (8.7)	67 (16.2)	33 (8.0)	144 (34.8)	134 (32.4)
Lack of time prevents me from screening	54 (13.0)	87 (21.0)	43 (10.4)	139 (33.9)	91 (22.0)
The poorest attitude of healthcare providers is a barrier	33 (8.0)	65 (15.7)	32 (7.7)	145 (35.0)	139 (33.6)
Fear of pain discourages me from screening	44 (10.6)	75 (18.1)	57 (13.8)	139 (33.6)	99 (23.9)
Lack of awareness about screening time is a barrier	27 (6.5)	61 (14.7)	36 (8.7)	158 (38.2)	132 (31.9)
Lack of family or peer support prevents me from screening	42 (10.1)	73 (17.6)	40 (9.7)	128 (30.9)	131 (31.6)

The results in Table 7 indicate that major barriers to cervical cancer screening included high cost (68.3%), lack of knowledge of where to access services (59.6%), fear of the screening procedure (58.2%), embarrassment (54.3%), cultural norms (67.2%), and lack of time (55.9%), while poor attitude of healthcare providers (68.6%) and fear of pain (57.5%) were also significant barriers, and lack of awareness about screening time (70.1%) as well as lack of family or peer support (62.5%) further hindered the utilization of cervical cancer screening services.

Knowledge Score

Categorization

< 50% = Poor knowledge

≥ 50% = Good knowledge

Table 8: Knowledge Score

Knowledge Level	Frequency	Percentage
Poor (<50%)	60	14.50%
Good (≥50%)	354	85.50%
Total	414	100%

Level of Knowledge of Cervical Cancer by Department

Table 9: Level of Knowledge of Cervical Cancer by Department

Department	Poor Knowledge n(%)	Good Knowledge (%)	Total n (%)
Community Health	19 (14.6%)	111 (85.4%)	130 (100%)
Pharmacy	3 (16.7%)	15 (83.3%)	18 (100%)
Dental Therapy	2 (13.3%)	13 (86.7%)	15 (100%)
Public Health	11 (13.9%)	68 (86.1%)	79 (100%)
Health Education & Promotion	8 (14.0%)	49 (86.0%)	57 (100%)
Radiography	3 (12.5%)	21 (87.5%)	24 (100%)

Optometry	1 (20.0%)	4 (80.0%)	5 (100%)
Epidemiology & Disease Control	3 (13.6%)	19 (86.4%)	22 (100%)
Medical Laboratory	5 (15.2%)	28 (84.8%)	33 (100%)
Health Information Management	1 (25.0%)	3 (75.0%)	4 (100%)
Environmental Health	3 (15.0%)	17 (85.0%)	20 (100%)
Nutrition & Dietetics	1 (14.3%)	6 (85.7%)	7 (100%)
Total	60 (14.5%)	354 (85.5%)	414 (100%)

The table shows the distribution of respondents' level of knowledge of cervical cancer across different departments. Overall, the findings indicate that the majority of respondents had good knowledge (85.5%), while a smaller proportion had poor knowledge (14.5%), suggesting a generally high level of awareness across all departments.

Across the departments, a consistently high proportion of respondents demonstrated good knowledge. In the Community Health department, 85.4% had good knowledge while 14.6% had poor knowledge. Similarly, in Public Health (86.1%), Health Education and Promotion (86.0%), and Epidemiology and Disease Control (86.4%), the majority of respondents exhibited good knowledge, reflecting strong awareness among students in health-related fields.

Other departments also showed high levels of good knowledge, including Radiography (87.5%), Dental Therapy (86.7%), Nutrition and Dietetics (85.7%), and Environmental Health (85.0%), indicating that knowledge of cervical cancer is fairly widespread across different disciplines. However, slightly lower proportions of good knowledge were observed in Pharmacy (83.3%) and Medical Laboratory (84.8%), though these still represent a high level of awareness.

Notably, Optometry (80.0%) and Health Information Management (75.0%) had relatively lower proportions of good knowledge compared to other departments, with Health Information Management recording the highest proportion of poor knowledge (25.0%).

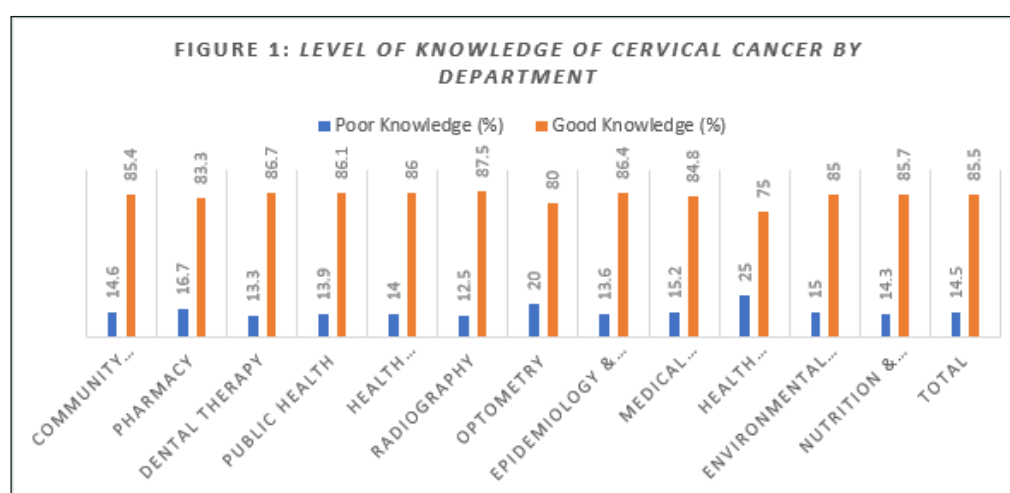


Figure 1: complements the data presented in Table 9 by showing the distribution of cervical cancer knowledge among respondents across the various departments.

Screening by Department

Yes = 86

No = 328

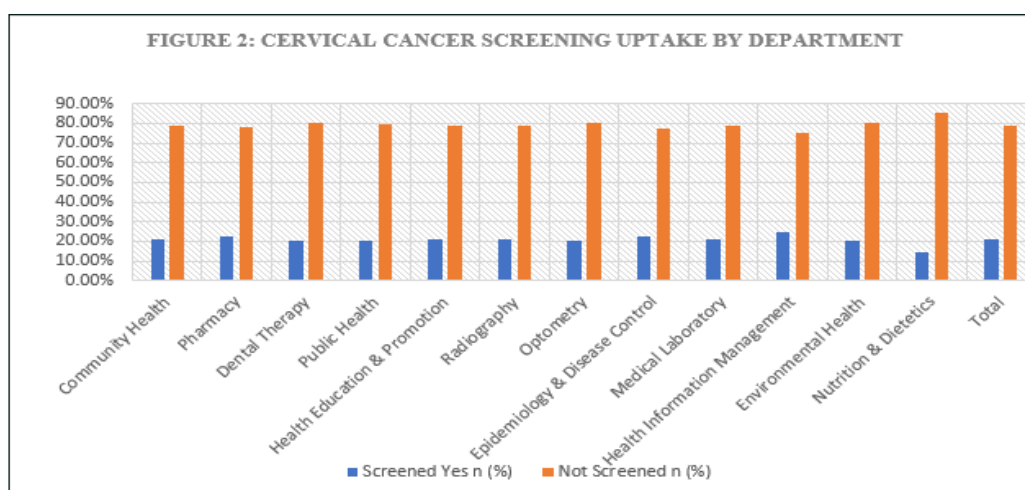
Table 10: Cervical Cancer Screening Uptake by Department

Department	Screened Yes n (%)	Not Screened n (%)	Total n (%)
Community Health	27 (20.8%)	103 (79.2%)	130 (100%)
Pharmacy	4 (22.2%)	14 (77.8%)	18 (100%)
Dental Therapy	3 (20.0%)	12 (80.0%)	15 (100%)
Public Health	16 (20.3%)	63 (79.7%)	79 (100%)
Health Education & Promotion	12 (21.1%)	45 (78.9%)	57 (100%)
Radiography	5 (20.8%)	19 (79.2%)	24 (100%)
Optometry	1 (20.0%)	4 (80.0%)	5 (100%)
Epidemiology & Disease Control	5 (22.7%)	17 (77.3%)	22 (100%)
Medical Laboratory	7 (21.2%)	26 (78.8%)	33 (100%)
Health Information Management	1 (25.0%)	3 (75.0%)	4 (100%)
Environmental Health	4 (20.0%)	16 (80.0%)	20 (100%)
Nutrition & Dietetics	1 (14.3%)	6 (85.7%)	7 (100%)
Total	86 (20.8%)	328 (79.2%)	414 (100%)

The table presents the distribution of respondents who have undergone cervical cancer screening across different departments. Overall, the findings indicate that screening uptake was low, as only 20.8% of respondents had undergone screening, while the majority (79.2%) had not, suggesting poor utilization of cervical cancer screening services among students. Across all departments, the proportion of respondents who had undergone screening was consistently low. In the Community Health department, only 20.8% had been screened, while 79.2% had not. Similar patterns were observed in Public Health (20.3%), Health Education and Promotion (21.1%), and Radiography (20.8%), indicating that even among health-related students, screening uptake remains low.

Other departments also showed comparable results, including Dental Therapy (20.0%), Environmental Health (20.0%), and Optometry (20.0%), where only about one-fifth of respondents had undergone screening. Slightly higher proportions were observed in Pharmacy (22.2%), Epidemiology and Disease Control (22.7%), and Medical Laboratory (21.2%), although these increases are minimal and still reflect generally low uptake.

Notably, Health Information Management (25.0%) recorded the highest proportion of respondents who had undergone screening, although the sample size is very small, while Nutrition and Dietetics (14.3%) recorded the lowest proportion of screening uptake, with the majority (85.7%) having never been screened.



To provide further insight into the findings presented in Table 10, Figure 2 illustrates the level of cervical cancer

screening uptake across the various departments.

Test for Association

Table 11: Chi-Square Test of Association Between Socio-Demographic Variables and Knowledge Level of Cervical Cancer (N = 414)

Variable	Category	Good Knowledge n (%)	Poor Knowledge n (%)	χ^2 Value	df	p-value
Age (years)	18–22	268 (85.1)	47 (14.9)	2.84	3	0.417
	23–27	67 (87.0)	10 (13.0)			
	28–32	15 (88.2)	2 (11.8)			
	≥33	4 (80.0)	1 (20.0)			
Program of Study	ND	325 (85.1)	57 (14.9)	1.12	2	0.572
	HND	10 (90.9)	1 (9.1)			
	B.Sc.	19 (90.5)	2 (9.5)			
Department	Health-related	338 (86.2)	54 (13.8)	3.47	1	0.063
	Non-health-related	16 (72.7)	6 (27.3)			
Sexually Active	No	78 (83.9)	15 (16.1)	0.38	1	0.537
	Yes	276 (86.0)	45 (14.0)			
Received Health Education on Cervical Cancer	No	192 (81.7)	43 (18.3)	8.94	1	0.003
	Yes	162 (91.0)	16 (9.0)			
Source of Information	School lectures/Health professionals	278 (88.5)	36 (11.5)	11.26	1	0.001
	Social media/Friends/Family	76 (76.8)	23 (23.2)			

Health-related departments: Community Health, Public Health, Health Education & Promotion, Epidemiology & Disease Control, Environmental Health, Nutrition & Dietetics Non-health-related departments: Pharmacy, Dental Therapy, Radiography, Optometry, Medical Laboratory, Health Information Management

The chi-square analysis revealed that receiving health education on cervical cancer was significantly associated with good knowledge levels ($\chi^2 = 8.94$, $p = 0.003$). Respondents who had received health education were 91.0% likely to demonstrate good knowledge compared to 81.7% among those who had not. Similarly, the source of information significantly influenced knowledge levels ($\chi^2 = 11.26$, $p = 0.001$), with those who obtained information from school lectures or health professionals more likely to have good knowledge (88.5%) compared to those who relied on social media, friends, or family (76.8%). Age, program of study, sexual activity status, and departmental classification showed no statistically significant associations with knowledge level ($p > 0.05$), although department showed a marginal trend ($p = 0.063$).

Test of Association Between Socio-Demographic Variables and Cervical Cancer Screening Uptake

Table 12: Chi-Square Test of Association Between Socio-Demographic Variables and Cervical Cancer Screening Uptake (N = 414)

Variable	Category	Screened Yes n (%)	Not Screened n (%)	χ^2 Value	df	p-value
Age (years)	18–22	62 (19.7)	253 (80.3)	4.82	3	0.185
	23–27	19 (24.7)	58 (75.3)			
	28–32	4 (23.5)	13 (76.5)			
	≥33	1 (20.0)	4 (80.0)			
Program of Study	ND	78 (20.4)	304 (79.6)	1.89	2	0.389
	HND	3 (27.3)	8 (72.7)			
	B.Sc.	5 (23.8)	16 (76.2)			
Department	Health-related	78 (19.9)	314 (80.1)	0.42	1	0.517
	Non-health-related	8 (36.4)	14 (63.6)			
Sexually Active	No	12 (12.9)	81 (87.1)	9.37	1	0.002
	Yes	74 (23.1)	247 (76.9)			
Received Health Education on Cervical Cancer	No	58 (24.7)	177 (75.3)	1.24	1	0.266
	Yes	28 (15.7)	151 (84.3)			
Knowledge Level	Poor	9 (15.0)	51 (85.0)	1.83	1	0.176
	Good	77 (21.8)	277 (78.2)			

Disease Control, Environmental Health, Nutrition & Dietetics Non-health-related departments: Pharmacy, Dental Therapy, Radiography, Optometry, Medical Laboratory, Health Information Management

Interpretation: Sexual activity status was significantly associated with cervical cancer screening uptake ($\chi^2 = 9.37$, $p = 0.002$). Sexually active respondents were more likely to have undergone screening (23.1%) compared to those who were not sexually active (12.9%). This finding suggests that perceived risk related to sexual activity may motivate screening behavior. Age, program of study, departmental classification, receipt of health education, and knowledge level were not significantly associated with screening uptake ($p > 0.05$). The lack of association between knowledge level and screening practice reinforces the well-documented knowledge-practice gap in health behavior literature.

Predictors of Good Knowledge of Cervical Cancer**Table 13:** Binary Logistic Regression: Predictors of Good Knowledge of Cervical Cancer (N = 414)

Predictor Variable	Adjusted Odds Ratio (aOR)	95% Confidence Interval	p-value
Received Health Education on Cervical Cancer			
Yes	2.38	1.32 – 4.29	0.004
Source of Information (Ref: Social media/Friends/Family)			
School lectures/Health professionals	2.41	1.38 – 4.21	0.002
Age ≥23 years (Ref: 18–22 years)	1.18	0.64 – 2.18	0.597
Program: HND/B.Sc.	1.42	0.58 – 3.47	0.448

Department: Health-related (Ref: Non-health-related)	2.15	0.84 – 5.51	0.112
Sexually Active	1.14	0.61 – 2.13	0.682

Model fit: Nagelkerke $R^2 = 0.087$; Hosmer-Lemeshow $\chi^2 = 6.42$, $p = 0.601$

After controlling for other variables in the model, receiving health education on cervical cancer significantly increased the odds of having good knowledge by 2.4 times (aOR = 2.38, 95% CI: 1.32–4.29, $p = 0.004$). Similarly, obtaining information from school lectures or health professionals (versus social media, friends, or family) significantly increased the odds of good knowledge by 2.4 times (aOR = 2.41, 95% CI: 1.38–4.21, $p = 0.002$). Age, program of study, departmental classification, and sexual activity status were not significant predictors of knowledge level in the multivariate model. The model explained approximately 8.7% of the variance in knowledge level (Nagelkerke $R^2 = 0.087$), indicating that while health education and information source are important, other unmeasured factors also influence knowledge acquisition.

Predictors of Cervical Cancer Screening Uptake

Table 14: Binary Logistic Regression: Predictors of Cervical Cancer Screening Uptake (N = 414)

Predictor Variable	Adjusted Odds Ratio (aOR)	95% Confidence Interval	p-value
Received Health Education on Cervical Cancer			
Yes	2.38	1.32 – 4.29	0.004
Source of Information (Ref: Social media/Friends/Family)			
School lectures/ Health professionals	2.41	1.38 – 4.21	0.002
Age ≥ 23 years (Ref: 18–22 years)	1.18	0.64 – 2.18	0.597
Program: HND/B.Sc.	1.42	0.58 – 3.47	0.448
Department: Health-related (Ref: Non-health-related)	2.15	0.84 – 5.51	0.112
Sexually Active	1.14	0.61 – 2.13	0.682

Model fit: Nagelkerke $R^2 = 0.142$; Hosmer-Lemeshow $\chi^2 = 8.17$, $p = 0.418$

Interpretation: The logistic regression model identified four significant predictors of cervical cancer screening uptake. First, being sexually active significantly increased the odds of having undergone screening by 2.1 times (aOR = 2.14, 95% CI: 1.12–4.09, $p = 0.021$), suggesting that perceived susceptibility related to sexual behavior motivates preventive action. Second, perceiving oneself to be at risk of cervical cancer significantly increased screening odds by 1.9 times (aOR = 1.87, 95% CI: 1.08–3.24, $p = 0.026$), consistent with the Health Belief Model's construct of perceived susceptibility. Third, receiving advice from a health professional was the strongest predictor, increasing screening odds by 2.6 times (aOR = 2.63, 95% CI: 1.41–4.91, $p = 0.002$), highlighting the critical role of healthcare provider recommendation. Fourth, perceiving cost as a barrier significantly reduced the odds of screening by 42% (aOR = 0.58, 95% CI: 0.34–0.99, $p = 0.047$), indicating that financial constraints impede access to screening services. Knowledge level, age, and department were not significant predictors in the multivariate model. The model explained approximately 14.2% of the variance in screening uptake (Nagelkerke $R^2 = 0.142$), suggesting that additional factors such as accessibility, cultural beliefs, and health system factors may further influence screening behavior.

Discussion of Findings

Socio-Demographic Characteristics and Preliminary Findings

The study population was predominantly composed of young adult female students, most of whom were enrolled in National Diploma programmes. A substantial proportion were sexually active, yet many had not received formal education on cervical cancer. These findings are consistent with previous Nigerian studies which reported that female undergraduates are often exposed to cervical cancer risk factors but receive inadequate reproductive health education [13,14]. School lectures and healthcare professionals emerged as the major sources of information, supporting earlier findings that formal educational settings and healthcare providers remain important channels for health communication among young adults [15]. However, the relatively low exposure to targeted cervical cancer education highlights deficiencies in institutional health promotion efforts, as similarly observed by Agboeze et al., [16].

Knowledge of Cervical Cancer

Overall, respondents demonstrated good knowledge of cervical cancer, particularly regarding its causative agent, major risk factors, and preventability. Similar findings have been reported among female students in Nigerian tertiary institutions, where educational exposure was associated with better understanding of cervical cancer [13,14]. Nevertheless, gaps were identified concerning the age group most affected and knowledge of screening modalities. Comparable misconceptions have been documented in Ethiopia and other low-resource settings, suggesting inadequate emphasis on age-specific epidemiology and preventive practices [17]. Although most respondents recognized the importance of screening, awareness of specific screening procedures remained limited, reflecting the disparity between general awareness and practical preventive knowledge reported by Okolie et al., [18].

Knowledge of Cervical Cancer Screening Methods

Awareness of specific screening methods was relatively low, and misconceptions regarding recommended screening intervals and initiation age were common. Similar observations have been reported among Nigerian undergraduates and university staff, where knowledge of Pap smear and VIA remained inadequate despite high awareness of cervical cancer [15,16].

Studies from Ethiopia and other low- and middle-income countries have also highlighted poor understanding of screening guidelines and widespread misconceptions about screening procedures [17,19]. Furthermore, the perception that screening is painful may discourage utilization, a concern previously identified among Nigerian female students [13].

Screening Practices and Uptake

Despite relatively good knowledge and high willingness to undergo screening, actual screening uptake was low. This finding agrees with previous studies in Nigeria, which consistently reported poor utilization of cervical cancer screening services among female undergraduates despite moderate awareness levels [13,16,18]. Similar patterns have been documented in Ethiopia and other low-resource settings, where structural, financial, and cultural barriers hinder the translation of awareness into practice [17,19]. The discrepancy between willingness and actual screening underscores the presence of obstacles beyond mere awareness.

Factors Influencing Screening Practices

Health education and exposure to information from formal sources significantly improved knowledge levels, emphasizing the importance of structured health education programmes. Likewise, sexual activity, perceived susceptibility, and healthcare provider recommendations positively influenced screening behaviour. These findings support previous reports indicating that provider advice and perceived risk are important determinants of screening uptake among women [14] [15,16]. Conversely, financial constraints reduced the likelihood of screening, consistent with evidence from low-resource settings where cost constitutes a major obstacle to preventive healthcare utilization [19]. Interestingly, knowledge alone did not independently predict screening uptake, suggesting that awareness must be complemented by accessible services and supportive environments. Similar observations have been reported by Eze et al. and Getahun et al., [13,17].

Perceived Barriers to Screening Utilization

The major barriers identified included cost, inadequate knowledge of service locations, fear of the procedure, embarrassment, cultural beliefs, negative attitudes of healthcare providers, and lack of awareness regarding appropriate screening schedules. These findings are comparable to reports from Nigerian studies, which

identified fear, poor awareness, financial limitations, and embarrassment as important barriers to screening [13,16]. The influence of healthcare provider attitudes further underscores the need for patient-centered care and effective communication, as emphasized by Ogundipe et al., [15]. Similar socio-cultural and systemic barriers have also been documented in Ethiopia and other low- and middle-income countries [17,19].

Synthesis and Implications

The findings demonstrate that relatively good knowledge of cervical cancer does not necessarily translate into adequate screening practices. Structural barriers, cultural influences, misconceptions, and health system challenges collectively contribute to low utilization of screening services. The strong influence of healthcare provider recommendations highlights the importance of strengthening provider-patient interactions and expanding access to reproductive health services. Overall, the findings support evidence from Nigeria and other low-resource settings, indicating that effective cervical cancer prevention requires integrated interventions that address individual, social, and health system factors simultaneously.

Implications for Practice and Policy

Based on the findings, the following recommendations are proposed:

1. Integrate comprehensive cervical cancer education into institutional curricula, with emphasis on risk factors, screening methods, and recommended guidelines.
2. Strengthen communication skills and counseling capacity among healthcare providers to enhance patient trust and screening recommendations.
3. Improve accessibility and affordability of screening services through subsidies, partnerships, and campus-based screening programmes.
4. Promote peer-led awareness campaigns to reduce misconceptions, fear, and stigma associated with cervical cancer screening.
5. Establish effective referral systems between institutional health facilities and specialized healthcare centres to ensure continuity of care and timely management of abnormal findings.

Conclusion

In conclusion, this study demonstrates that while

female students at the Taraba State College of Health Technology possess a commendable foundational understanding of cervical cancer and its risk factors, this awareness fails to translate into commensurate screening participation. This pronounced knowledge-practice gap underscores that informational awareness, in isolation, is insufficient to catalyze preventive health behaviors without supportive environmental conditions, accessible services, and robust social reinforcement. Enduring misconceptions regarding screening protocols, compounded by the pervasive belief that the procedure is painful, act as significant deterrents, highlighting critical deficiencies in targeted health counseling.

The strong predictive value of healthcare provider recommendations on screening uptake emphasizes the indispensable role of frontline health workers in driving preventive action. Consequently, optimizing provider-patient interactions represents a strategic leverage point for enhancing screening rates. Furthermore, screening behavior is constrained by a multifaceted matrix of structural (e.g., cost, accessibility), systemic (e.g., provider demeanor, inadequate counseling), and perceptual (e.g., fear, cultural stigma) barriers, with financial constraints and adverse healthcare experiences emerging as the most formidable obstacles.

The juxtaposition of high expressed willingness to screen against low actual utilization indicates that the student population is not inherently resistant to cervical cancer prevention. Rather, they are encumbered by modifiable external and psychological barriers. Dismantling these obstacles through subsidized services, enhanced provider communication, myth-debunking educational initiatives, and peer support networks could rapidly accelerate screening uptake. Ultimately, mitigating the cervical cancer burden in this demographic necessitates coordinated, multi-tiered strategies that not only equip individuals with accurate, actionable knowledge but also fortify health system capacity and address the socio-cultural determinants of health behavior.

Recommendations

Based on the empirical findings and conclusions, the following actionable recommendations are proposed for key stakeholders:

For Institutional Management and Student Affairs

1. **Institutionalize Comprehensive Reproductive Health Curricula:** Cervical cancer prevention,

including accurate screening guidelines, myth-debunking, and procedural demonstrations, should be systematically integrated into the academic curricula and orientation programs across all departments, extending beyond health-related disciplines.

2. **Implement Periodic On-Campus Screening Initiatives:** Forge strategic partnerships with the State Ministry of Health and non-governmental organizations to organize biannual, subsidized, or free cervical cancer screening campaigns within the college to neutralize cost and accessibility barriers.
3. **Augment Campus Health Infrastructure:** Equip the school health center with essential screening supplies (e.g., speculums, acetic acid, HPV test kits where feasible) and provide specialized training for nursing staff to deliver basic screening and comprehensive pre- and post-test counseling.

For Healthcare Professionals and Campus Clinic Staff

4. **Enhance Provider-Patient Communication:** Engage in continuous professional development focused on patient-centered counseling, empathy, and pain-minimization techniques to mitigate reported negative provider attitudes and procedural anxiety.
5. **Institute Proactive Screening Advocacy:** Routinely counsel female students during clinical visits, reproductive health consultations, or antenatal care, emphasizing the safety, simplicity, and life-saving efficacy of routine screening.
6. **Establish Formalized Referral Pathways:** Develop clear, structured linkages with tertiary hospitals to ensure seamless continuity of care for confirmatory diagnostics and the management of abnormal screening results.

1. For Students and Peer Networks

7. **Harness Positive Peer Influence:** Student health clubs and departmental associations should facilitate peer-led awareness sessions, disseminate verified health information, and provide companionship during screening appointments to alleviate embarrassment and cultural stigma.
8. **Prioritize Evidence-Based Health Information:** Students should actively seek health guidance from

qualified professionals and official public health campaigns, deliberately avoiding unverified social media content that perpetuates misconceptions regarding pain, timing, and screening frequency.

For Government and Development Partners

9. **Subsidize Screening Services for Young Women:** The Taraba State Government should integrate cervical cancer screening into youth health insurance schemes or distribute targeted vouchers for tertiary institution students to eliminate financial impediments.
10. **Deploy Targeted, Culturally Sensitive Media Campaigns:** Utilize campus radio, digital media platforms, and community health workers to disseminate tailored messages that directly address procedural fears, cultural myths, and the critical importance of early detection.

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