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Knowledge of cervical cancer, risk factors, and barriers to screening among reproductive women in Nigeria

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ABSTRACT

Background: The leading cause of cancer-related fatalities among women worldwide is cervical cancer. Lack of awareness and availability of screening services in Nigeria contribute to the high incidence and fatality rates of cervical cancer. This study assesses the knowledge of cervical cancer, risk factors, and barriers to screening among reproductive women in Nigeria.

Methods: A cross-sectional study was conducted among women of reproductive age in Shao, Moro local government area of Kwara State, Nigeria, to determine their knowledge about cervical cancer, risk factors, and barriers to screening. The data were collected using a structured questionnaire and analyzed using descriptive statistics and inferential statistics.

Results: A total of 326 women between the ages of 15–50 were included in the study, with the majority being married (56.1%) and having secondary school education (43.6%). Two-hundred seventy-one (83.1%) participants were aware of cervical cancer, but only 39.0% had good knowledge of the disease. Two hundred forty-three (74.5%) women were sexually active and 70% did not use condoms during sexual activity. Only 6.9% of the participants had ever been screened for cervical cancer, with 38.0% being unaware of the screening. The results showed that there was a statistically significant ($P<0.001$) association between the knowledge of the respondents and selected risk factors for cervical cancer such as sexual activity, previous sexually transmitted infection diagnosis, contraceptive usage, and abnormal bleeding.

Conclusion: This study indicates poor knowledge of cervical cancer and that targeted health education campaigns are required to increase awareness and knowledge about cervical cancer among reproductive women in Nigeria. Efforts should also be made to improve access to cervical cancer screening services, especially in rural and underserved areas.

Keywords: Cervical cancer; Risk factors; Knowledge; Screening; Women; Nigeria

INTRODUCTION

Cancer is a condition where cells grow abnormally and uncontrollably, spreading to other parts of the body. When the disease originates from the cervix, it is called cervical cancer. Cervical cancer is the fourth most common form of cancer in women globally, with about 604,000 new cases and 342,000 deaths in 2020.[1] The highest burden of this disease is in low and middle-income countries. Women living with human immunodeficiency virus (HIV) are more susceptible to cervical cancer, with an estimated 5% of all cases linked to HIV, while 99% of cervical cancer cases are caused by infection with high-risk human papillomaviruses (HPV).[2] HPV is a very common sexually transmitted infection (STI), with 60%–80% of sexually active women infected, and a high prevalence among women ages 22–25. There has been growing interest in HPV recently due to its association with abnormal cell growth, particularly that of the cervix. Clinically, epidemiologically, and at the molecular level, it has been proven that HPV is a likely cause of cervical cancer, with 13 genotypes closely linked to it.[3] Cervical cancer has the highest incidence and mortality rates in Sub-Saharan Africa, particularly among women in their prime. This is concerning because the disease is preventable and curable using currently available methods. Cervical cancer is the second most common cancer in Nigeria, surpassed only by breast cancer among women.[4] Presently, it has been reported that approximately 14,943 women in Nigeria are diagnosed with cervical cancer annually, and 10,403 of them eventually die from the disease.[5] The risk factors for the disease include previous HPV or other STIs, having multiple sexual partners, using oral contraceptives, tobacco use, being in a relationship with an uncircumcised male, and starting sexual intercourse at an early age.[6]

Several studies conducted across multiple regions in Nigeria have characterized HPV prevalence, but there is significant variation in their findings.[7] However, an overall pooled HPV prevalence for the country of Nigeria remains challenging to determine.[7] Cervical cancer can be prevented through HPV vaccination and early detection through screening. In developed countries, mortality and morbidity rates have been significantly reduced, but underutilization of these measures remains a problem in developing countries like Nigeria, where resources are available.[8] Barriers to cervical cancer screening in Nigeria include limited knowledge, fear of stigma and discrimination, poor awareness, misconceptions about screening procedures, financial insecurity, and low quality of health care services.[5] The awareness and knowledge about cervical cancer screening among female Nigerian populations are inadequate, and the cost of screening, treatment if detected, and vaccination are unaffordable for the average Nigerian.[9] Poor access to screening and treatment services leads to high mortality rates from cervical cancer among women in developing countries.[1]

According to a study conducted in Ilorin, Nigeria, in 2015, only 8.0% of the 338 participants surveyed had been screened for cervical cancer. The study also found that women who had a positive attitude towards screening were more likely to have been screened. While most participants were aware of cervical cancer screening, the majority had limited knowledge of the disease.[10] Several studies conducted in low and middle-income countries indicate a low rate of cervical cancer screening tests.[11] A study on the health-seeking behavior of cervical cancer patients in Ethiopia found that women had little awareness of the disease and often turned to traditional remedies for early-stage treatment.[11]

The accessibility to cervical cancer screening services is quite limited in Ilorin, Nigeria, which is the capital city of our study population, with screening being sparsely available in

government-owned health facilities supported by a few non-governmental organizations. The cost of screening can be high and unaffordable for many women, who predominantly depend on out-of-pocket healthcare expenditures. This study aims to assess the level of awareness and knowledge about cervical cancer, identify risk factors and barriers to cervical screening, and provide solutions in Shao Local Government Area, Kwara State, Nigeria.

METHODS

Study design and settings

A multi-stage random sampling technique was employed to select compound households consisting of reproductive women aged 15–49 years in the community. This descriptive cross-sectional study aimed to assess the knowledge, risk factors, and barriers to cervical screening among reproductive-aged women in Shao, Moro Local Government Area, Kwara State, Nigeria, using a quantitative method of data collection.

The study was conducted in Shao, Moro Local Government Area in Kwara State, Nigeria, located at an elevation of 269 m above sea level with an estimated population of 9,529 people. Shao is 14 km from Ilorin and 15 km from Malete town, the home of Kwara State University. Its geographical coordinates are 8° 35'0" North, 4° 34'0" East. The indigenous population is moderately educated, with 10 secondary and 15 primary schools in the community.

Inclusion and exclusion criteria

All reproductive-aged women (15–49 years) who are permanent residents of Shao and agreed to participate in the study were included.

The exclusion criteria were women outside the reproductive age group, those who were ill, those who declined to participate, and women who were not residents of Shao.

Data resources and measurement

Data collection tool
The study utilized a semi-structured interviewer-administered questionnaire, developed using a review of relevant literature and previous research. The questionnaire consisted of 4 sections: Socio-demographic data (A), Knowledge of cervical cancer (B), Risk factors for cervical cancer (C), and Barriers to cervical cancer screening (D).

Sample size
The sample size for this study was determined using Fisher's formula for sample size:

$$n = \frac{Z^2 Pq}{d^2}$$

Where n is the minimum sample size, Z is the standard deviation, set at 1.96, which corresponds to a 95% confidence interval, and P is the percentage of women aware of cervical cancer (36% or 0.36),[12] q is the complementary probability of P, which is $(1 - p)$, that is, the percentage of women not aware of cervical cancer = 1 − 0.36 = 0.64, and d = degree of accuracy desired (usually set at 5% or 0.05). A total sample size of 326 was derived and included in the study.

Pretesting

Thirty-three questionnaires were administered to a representative sample of women of reproductive age in Malete, Moro LGA, Kwara State. The purpose of the pretest was to evaluate the survey for its format and wording and to identify its strengths and weaknesses.

Method of data collection

Three research assistants, who are undergraduates in public health and medical laboratory science, were trained. The questionnaire was written in English and was used to collect information as explained in each section. Anonymity and confidentiality of the information obtained was assured and maintained.

Measurement of variables and data processing

The scoring and grading of knowledge questions was done before analysis. One mark was allotted to each correct answer, while a zero (0) mark was allotted to each incorrect answer. The grading of correct scores was done by converting the total obtainable correct score to a percentage. The annotation for the grading is 0%–100%, such that 0%–40% is described as poor knowledge, 41%–69% is described as fair knowledge, and 70%–100% is described as good knowledge.

Data analysis

The data collected was cleaned and preprocessed. The data analysis was conducted in reference to the analysis structure to achieve the objective set at the onset. The data were summarized using tables, graphs, and charts. A χ^2 was used to test the associations between the outcome variables and the independent variable factors. Epi-info statistical software package version 3.5.1 (Centers for Disease Control and Prevention, Atlanta, GA, USA) was used for data analysis. The level of significance for the statistical tests was set at 0.05.

Consent of protection of human subjects

There was no identifying information such as names in the data given by the respondents. The identified data was encrypted and stored in a separate file to ensure utmost confidentiality, this file was later used and accessed by authorized personnel to link the data for logistical and management purposes. The collected data was stored and secured safely.

Ethical consideration

Permission to conduct the study was obtained from the Department of Public Health, Kwara State University, Malete. Ethical approval was requested and obtained from the Ministry of Health, Ilorin, Kwara State, Nigeria (reference number MOH/KS/EU/777/506) and was submitted to the Head of Community and Medical Director of the community health center. The approval of the elders from the study community was obtained before the commencement of the study. We ensured that informed consent was obtained from the participants and that any information given by them would be treated with the utmost confidentiality and used for the purpose of educational research only. Strict ethical principles were duly practiced during the study, and participation was voluntary.

RESULTS

Demographic data

The socio-demographic data for the study population are provided in **Table 1**. A total of 326 women were included in the study. The average age of the respondents was in the age group of 21–26 years (46.9%). A larger population of the participants were married (56.1%), while (39.9%) were single. Most of the participants had completed secondary school (43.6%), followed by tertiary education (28.2%), and no prior education (13.8%). Ninety-nine (30.4%) respondents were nulliparous; 51.8% of the respondents were Christian; Yoruba (78.6%); traders (40.8%), and 87.4% of the respondents earn less than ₦630,000 monthly. The respondent's knowledge of cervical cancer is provided in **Table 2**. Two-hundred seventy-one

Table 1. Socio-demographic data of respondents (n = 326)

Variables	Frequency	Percentage
Age groups		
15–20	73	22.4%
21–26	153	46.9%
27–32	60	18.4%
33–38	19	5.8%
39–44	7	2.1%
45–49	14	4.3%
Mean ± SD	25.19 ± 7.18	
Marital status		
Married	183	56.1%
Single	130	39.9%
Divorced	8	2.5%
Widow	5	1.5%
Level of education		
Tertiary	92	28.2%
Secondary	142	43.6%
Primary	47	14.4%
No Education	45	13.8%
Parity		
0	99	30.4%
1	72	22.1%
2	59	18.1%
3	34	10.4%
4	42	12.9%
> 4	20	6.1%
Religion		
Islamic	157	48.2%
Christianity	169	51.8%
Ethnicity		
Yoruba	256	78.6%
Igbo	19	5.8%
Hausa	44	13.5%
Others	7	2.1%
Occupation		
Trader	133	40.8%
Civil servant	25	7.7%
Teacher	27	8.3%
Unemployed	72	22.1%
Students	39	12.0%
Artisans	24	7.4%
Others	6	1.8%
Income (per month)		
< ₦630,000	285	87.4%
≥ ₦630,000	41	12.6%

SD = standard deviation.

Table 2. Respondents knowledge of cervical cancer

Variables	Frequency	Percentage
Aware of cervical cancer		
Yes	271	83.1%
No	55	16.9%
Sources of information (n = 271)		
Media	135	49.8%
Friends	56	20.7%
Family members	39	14.4%
Medical personnel	41	15.1%
Description of cervical cancer (n = 271)		
Cancer of the cervix	124	45.8%
Cancer of vagina	32	11.8%
Cancer of the breast	115	42.4%
Those at risk of cervical cancer (n = 271)		
Women	197	72.7%
Men	0	0.0%
Both gender	74	27.3%
Cervical cancer can kill (n = 271)		
Yes	249	91.9%
No	22	8.1%

Table 3. Knowledge scores of the respondents

Knowledge	Frequency	Percentage
Poor	130	39.9%
Fair	69	21.2%
Good	127	39.0%
Total	326	100.0%

(83.1%) respondents were aware of cervical cancer, of which 49.8% got the information mostly from the media. One hundred twenty-four (45.8%) respondents describe cervical cancer as cancer of the cervix. More than half of the respondents (72.7%) agreed that cervical cancer only affects women, and 91.9% of the respondents were of the opinion that cervical cancer kills. The knowledge scores of the respondents are provided in **Table 3**.One hundred thirty (39.9%) respondents had poor knowledge of cervical cancer, 21.2% had fair knowledge of cervical cancer, and 39.0% had good knowledge of cervical cancer. This indicates that the respondents have poor knowledge of cervical cancer and cervical cancer screening.

Table 4 shows the risk factors for cervical cancer among the respondents. Two hundred forty-three (74.5%) respondents were sexually active, while 69.5% of the sexually active women started having sex from age 15 to 20 years. One hundred twenty-nine (53.1%) of the respondents have had multiple sexual partners, 70% of the respondents do not use condoms during sexual activity, while only 23.3% of the respondents who use condoms use them during sexual intercourse. Eighty-eight (27.0%) respondents had been diagnosed with an STI in the past, and 95.1% never bled after sexual intercourse. One hundred seventy (52.1%) respondents had used contraceptives for over 5 years, while 74.5% had experienced a worrisome vaginal discharge in the past. Two hundred fifty-one (77.0%) respondents do not have any knowledge of HPV.

Barriers to cervical cancer screening are provided in **Table 5**. Two hundred ten (64.4%) respondents did not have prior knowledge of cervical cancer screening, while 35.6% had knowledge of the screening. One hundred eight (93.1%) respondents had not been screened for cervical cancer, while all of the 6.9% of respondents who had been screened had done so once. Forty-one (38.0%) have not been screened because of lack of awareness about the screening.

Table 4. Risk factors for cervical cancer among respondents

Variables	Frequency	Percentage
Sexually active respondents		
Yes	243	74.5%
No	83	25.5%
Age at sexual debut (n = 243)		
< 15	58	23.9%
15–20	169	69.5%
> 20	16	6.6%
Has multiple sexual partner (n = 243)		
Yes	129	53.1%
No	114	46.9%
Condom use during sexual intercourse (n = 243)		
Yes	73	30.0%
No	170	70.0%
Frequency of condom use (n = 73)		
Always	17	23.3%
Sometimes	32	43.8%
Rarely	24	32.9%
Diagnosed with STIs in the past (n = 326)		
Yes	88	27.0%
No	238	73.0%
Bleeding after Sexual Intercourse (n = 326)		
Yes	16	4.9%
No	310	95.1%
Contraceptive Usage for over 5 years (n = 326)		
Yes	170	52.1%
No	156	47.9%
Worrisome vaginal discharge (n = 326)		
Yes	243	74.5%
No	83	25.5%
Knowledge of HPV (n = 326)		
Yes	75	23.0%
No	251	77.0%

Table 5. Barriers to cervical cancer screening: respondent's awareness of cervical cancer screening

Variables	Frequency	Percentage
Knowledge of cervical cancer screening (n = 326)		
Yes	116	35.6%
No	210	64.4%
Respondents who had been screened (n = 116)		
Yes	8	6.9%
No	108	93.1%
Frequency of being screened (n = 8)		
Once	8	100.0%
Reasons for not being screened yet (n = 108)		
Costly	35	32.4%
Afraid of result	5	4.6%
Husband not in support	2	1.9%
Lack of awareness	41	38.0%
No symptoms	21	19.4%
Embarrassment	4	3.7%

Table 6 shows the association between socio-demographic characteristics and respondents' knowledge of respondents on cervical cancer. There was a statistically significant association between knowledge score of the respondents and age, educational level, and occupation groups at $P < 0.001$. The relationship between some selected risk factors of cervical cancer and knowledge of respondents are provided in **Table 7**. There was a statistically significant association between knowledge scores and sexual activity, previous diagnosis with STIs, contraceptive usage for over 5 years and abnormal bleeding during menses at $P < 0.001$.

Table 6. Association between Socio-demographic characteristics and knowledge of respondents on cervical cancer

Variables	Knowledge			χ^2	P
	Poor (%)	Fair (%)	Good (%)		
Age groups				38.111	**< 0.001**
15–20	28 (38.4)	22 (30.1)	23 (31.5)		
21–26	52 (34.0)	26 (17.0)	75 (49.0)		
27–32	31 (51.7)	15 (25.0)	14 (23.3)		
33–38	14 (73.7)	3 (15.8)	2 (10.5)		
39–44	2 (28.6)	3 (42.8)	2 (28.6)		
45–49	3 (21.4)	0 (0.0)	11 (78.6)		
Marital status				11.482	0.075
Married	78 (42.6)	31 (16.9)	74 (40.4)		
Single	46 (35.4)	38 (29.2)	46 (35.4)		
Divorced	3 (37.5)	0 (0.0)	5 (62.5)		
Widowed	3 (60.0)	0 (0.0)	2 (40.0)		
Educational level				30.969	**< 0.001**
No education	25 (55.6)	5 (11.1)	15 (33.3)		
Primary	23 (48.9)	6 (12.8)	18 (38.3)		
Secondary	60 (42.3)	37 (26.1)	45 (31.7)		
Tertiary	22 (23.9)	21 (22.8)	49 (53.3)		
Occupation				43.691	**< 0.001**
Trader	68 (51.1)	21 (15.8)	44 (33.1)		
Civil servant	13 (52.0)	2 (8.0)	10 (40.0)		
Teacher	14 (51.9)	5 (18.5)	8 (29.6)		
Unemployed	18 (25.0)	28 (38.9)	26 (36.1)		
Students	13 (33.3)	8 (20.5)	18 (46.2)		
Others	4 (16.7)	5 (20.8)	15 (62.5)		
Income (per month)				5.186	0.075
< ₦630,000	108 (37.9)	65 (22.8)	112 (39.3)		
≥ ₦630,000	22 (53.7)	4 (9.8)	15 (36.6)		

Bold font *P*-value indicates statistical significance.

Table 7. Relationship between some selected risk factors of cervical cancer and knowledge of respondents

Variables	Knowledge			χ^2	P
	Poor (%)	Fair (%)	Good (%)		
Sexually active				26.493	**< 0.001**
Yes	114 (46.9)	53 (21.8)	76 (31.3)		
No	16 (19.3)	16 (19.3)	51 (61.4)		
Previous diagnosis with STIs				77.175	**< 0.001**
Yes	56 (63.6)	32 (36.4)	0 (0.0)		
No	74 (31.1)	37 (15.5)	127 (53.4)		
Bleeding after sexual intercourse				4.520	0.104
Yes	8 (50.0)	0 (0.0)	8 (50.0)		
No	122 (39.4)	69 (22.3)	119 (38.4)		
Contraceptive usage for over 5 years				30.969	**< 0.001**
Yes	122 (45.2)	8 (14.3)	40 (71.4)		
No	8 (14.3)	61 (22.6)	87 (32.2)		
Abnormal bleeding or spotting during menses				16.385	**< 0.001**
Yes	61 (53.0)	13 (11.3)	41 (35.7)		
No	69 (32.7)	56 (26.5)	86 (40.8)		

Bold font *P*-value indicates statistical significance.
STI = sexually transmitted infection.

DISCUSSION

This study reveals the knowledge of awareness, risk factors, and perceived barriers to cervical screening among women of reproductive age in Shao, Kwara State. Of the 326 reproductive women recruited for this study, 39.0% had good knowledge of cervical cancer. This is lower than the percentages from North Central Nigeria (50.9%),[13] Nigerian tertiary hospitals

(78.5%),[14] Enugu, Southeast Nigeria (85.9%),[15] and University College Hospital, Ibadan, Nigeria (80.9%).[16] In contrast, this is a higher percentage than those from Ogbomoso, Nigeria (22.6%),[17] Lagos, South West, Nigeria (12.8%),[18] and rural Lagos, Nigeria (15%).[19] These observed differences among women in Nigeria could be a result of some geographical factors among the study participants and study location, such as poor socioeconomic status, including educational status, work type, financial status, availability of cervical screening programs, and access to quality healthcare providers.[19] The low level of knowledge about cervical cancer among the participants in our study may be attributed to the fact that the study was conducted in a semi-urban area where few respondents had completed tertiary education.

Most of our participants heard about cervical cancer from the media, friends, and families; the least common source was from medical personnel. This finding is in agreement with the study conducted in a Nigerian tertiary hospital[14] that reveals that most of the participants got their knowledge from the media. All forms of media used to reach the masses play a key role in increasing the public's awareness about certain health and disease conditions. These media approaches should be encouraged and maximized to reach a larger public with cervical cancer, especially in rural and semi-urban areas. Additionally, medical and health practitioners are advised to contribute more to educating the women during their visits to the clinic and also by implementing health education, seminars, and free outreaches within this community, state, and country.[20]

The perceived risk factors for cervical cancer among our study participants reveal that a larger percentage of the respondents were sexually active while more than half of them had their sexual debut between age 20 and below, had multiple sexual partners with no condom use mostly, had contraceptive usage for over 5 years, and bled after sexual intercourse, worrisome vaginal discharge. This finding is in support of the study by Thakur et al.[21] among rural women on risk factors for cervical cancer. All of our participants reside in semi-urban to rural areas, this residence type could have predisposed most of them to these observed risk factors compared to those who live in the city. Knowledge of HPV was low among the respondents; this could be due to the fact that there is a low level of education and literacy among the participants, which is also related to their residence.

The major barrier to cervical cancer screening among the participants was due to the fact that most of them had no prior knowledge of the screening. This is in line with the study in Enugu State, Nigeria.[22] The percentage of those who had been screened among those who had knowledge of the screening has been screened just once, while most of them who had knowledge of the screening have not done so because of lack of awareness, cost implications, and no symptoms of any genital tract. This finding is in agreement with the low level of knowledge on cervical screening in qualitative and quantitative approaches[23] and among tertiary female students in other nations.[24,25] The frequency of the cervical cancer test is in accordance with a study in Great Britain, where almost all the participants had a record of being screened for cervical cancer once.[26]

In addition, age groups, educational status, and occupation all have statistically significant associations with the knowledge of the respondents on cervical cancer at a P-value < 0.001. This is supported by a study conducted among women of a faith-based organization in Nigeria.[13,22] This could be due to the fact that age is associated with and most often directly proportional to one's knowledge of certain diseases. It is not surprising that educational status is associated with the knowledge of the participants about the disease condition, education

increases the literacy of the people about many disease conditions, of which cervical cancer is not an exemption, likewise, job type has been recorded to have an association with some disease conditions because the level of your literacy determines the type of job people do mostly and increases their knowledge about some disease conditions.[27,28]

The relationship between some selected risk factors of cervical cancer in our study and the knowledge of the participants showed that sexual activity, previous diagnosis with STIs, contraceptive usage for over 5 years, and abnormal bleeding during menses have a statistically significant association with the knowledge of the participants at a *P*-value < 0.001. Sexual activity, especially at an early age, is most likely to increase the young lady's quest for knowledge and curiosity about what could be the consequences of what she was doing and how to avert those consequences.[21] A previous diagnosis with STIs increases the awareness and knowledge of those infected with other potential infections in the genital tract. Contraceptive usage for over 5 years might have increased their chances of having certain knowledge about cervical cancer from their nurses and health personnel at various times of going for family planning. Abnormal bleeding during menses most often would have made them speak out and seek medical care, which would have exposed them to cervical cancer.[28,29]

This study was limited to women of reproductive age in Shao town only due to constraints of time and funds. It would have been better if all women in and around Shao town were included and differences in knowledge and attitude regarding cervical cancer were assessed among the women in Shao and outside Shao town.

In conclusion, this study presents an approximately low level of knowledge of cervical cancer, high risk factors, and knowledge of the screening as a major barrier to cervical cancer screening among the participants in Shao Local Government, Ilorin, Nigeria. Media was the key tool in making the participants aware of cervical cancer. Sexual activity, an early age of sexual debut, multiple partners, no condom use, contraceptive usage for over 5 years, bleeding after sexual intercourse, and worrisome vaginal discharge were the perceived risk factors. Scientist may utilize and explore this understanding to isolate risk factors and barriers mostly misinterpreted in the establishing and planning of cancer screening programs in this community and similar communities to educate the women about risk factors and increases their uptake of the screening.

We recommend deliberate efforts by the ministries of health and primary health care to impose the screening of cervical cancer and its treatment services to be rolled out in all healthcare centers, both in rural and urban settlements, to ensure most women easily access the services. There is an urgent need for the medical personnel to increase the awareness of women that come to the clinic about cervical cancer and also develop several patient centered programs on personal health and hygiene, gender equality, and intervention programs in communities likely affected.

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