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ORIGINAL ARTICLE

Knowledge of cervical cancer and barriers to screening among women in a city in Northern Nigeria

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Abstract

Aim This study assessed the knowledge of cervical cancer and barriers to cervical screening uptake among women of reproductive age in a city in Northern Nigeria to guide the development of interventions.

Subject and Methods This was a cross-sectional study with women aged 15 to 49 years. A multi-stage sampling technique was used to select 230 women in Gombe state, Nigeria. A semi-structured, interviewer-administered questionnaire was used for data collection and analysed using descriptive and inferential statistics at 0.05 level of significance.

Results The respondents' age was 29.6 ± 8.06 years and 52.2% were Muslims. Over one third (34.3%) have tertiary-level education. Few (4.8%) had good knowledge of cancer of the cervix. Only 9.5% of the respondents aged 25-49 years had undergone cervical cancer screening using pap smear test; the majority (90.5%) did not have access to cervical cancer screening services in their communities. Barriers to cervical cancer screening uptake were: low perception of risk (32.8%), screening not recommended by a health worker (32.8%), poor awareness (32.2%) and lack of of clinics for cervical cancer screening in their communities (31.5%). There was an association between respondents' attitude, educational level, income, religion, availability of cervical cancer screening services in communities, and the uptake of cervical cancer screening ($p < 0.05$).

Conclusion This study provides information on the barriers to cervical screening uptake by women of reproductive age in northern Nigeria. These highlight the need for multi-component, multi-level interventions in Northern Nigeria to improve knowledge on the benefits of cervical screening. Targeted interventions on the identified barriers are the key steps to eliminate the challenges to cervical screening utilisation.

Keywords Cervical cancer · Knowledge · Barriers · Screening

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Introduction

Cervical cancer is one of the gynaecological cancers of public health concern. It contributed approximately 7% of the total number of new cases of cancer diagnosed in 2018 (Bray et al. 2018), and approximately 1 million women currently live with the disease (Ferlay et al. 2015). The burden is high in low and middle-income countries, especially in sub-Saharan Africa where funds for prevention, detection, diagnosis, and treatment are inadequate. It is the second most prevalent female cancer in Nigeria, accounting for 14,089 annual deaths (Bray et al. 2018). This is largely due to late detection as a result of limited access to information about cervical cancer and lack of access to screening, prevention and treatment services (Akinola et al. 2018; Akinfenwa and Monsur 2018; Bruni et al. 2015; Jedy-Agba and Adebamowo 2012).

Studies have revealed that women can be effectively managed for cervical cancer if it is detected early through screening, with better outcomes than when it is reported late which invariably leads to poor outcomes (World Health Organization 2018; Lees et al. 2016, World Health Organisation and International Agency for Research on

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Cancer, 2012). Hence, regular screening is a key priority for the detection and treatment of the disease.

The clinical practice guidelines of the Society of Obstetrics and Gynecology of Nigeria recommends health education for the general populace and HPV vaccination for females up to 26 years old as primary prevention strategies, while women aged 25–65 years should screen using cytology, visual inspection, and human papilloma virus (HPV) testing and a 5-year screening interval is recommended for a negative HPV test (Akinola et al. 2018).

Despite these recommendations, cervical cancer educational interventions and screening in Nigeria have remained low. This is due to several reasons ranging from lack of awareness, poor knowledge of risk factors of cervical cancer, poverty, marginalisation of women, and lack of infrastructure and resources, limiting availability and accessibility of the services in most of the healthcare facilities. Human papilloma virus vaccination is on the national immunisation schedule however, it is not free and is mostly provided through out-of-pocket payments (James et al. 2018). Furthermore, the few cervical cancer screening services existing in Nigeria are opportunistic and paid out-of-pocket (Idowu et al. 2016). Compounding this is the lack of national programmes and policies on population-based cervical cancer screening programs, and limited coverage of cancer prevention and treatment in the National Health Insurance Scheme, which invariably translates to out-of-pocket payments, limited access to and utilisation of services, and increased morbidity and deaths (Akinola et al. 2018; Denny et al. 2006; Oluwole et al. 2017; Balogun et al. 2012; Bruni and Castellsagué 2009).

The factors which hinder screening may be aggravated in the north-east zone of Nigeria in view of the high poverty rates in the region compared to other geopolitical zones in the country (Jaiyeola and Bayat 2020). The region also has pervasive socio-cultural norms which promote early marriage and polygamy (Allen and Adekola 2017), which may favour the transmission of the human papilloma virus. Furthermore, 98% of women in the country lack insurance coverage and the payment of N2,500 to N10,000 out of pocket for cervical cancer screening is a major barrier (Obom-Egbulem 2010). All these factors may hinder health-seeking behaviours for cervical screening which have been found to be influenced by socio-demographic factors, knowledge of the disease, perception of risk and severity of the disease, and availability and accessibility of services (Chadza et al. 2012).

Improved access to affordable and effective screening and treatment services is critical for cervical cancer prevention, and this can be achieved when conscious efforts are made to eliminate the critical barriers that influence women's utilisation of the services (Awofeso et al. 2018; World Health Organisation 2017). According to the WHO Global Strategy towards eliminating cervical cancer as a public health problem, all countries must work towards attaining the 90–70–90 targets. Specifically, the WHO Global Strategy sets a target which proposes that 90% of girls should be fully vaccinated with HPV vaccine by 15 years of age. Furthermore, 70% of women should be screened using a high-performance test by 35 and 45 years of age, and 90% of those with the cervical disease should be treated (World Health Organisation 2019). To achieve these, there is need for a robust understanding of the cultural, social, and structural barriers influencing cervical cancer screening. This will guide the development of effective interventions which engage communities to promote the utilisation of sustainable and socially acceptable screening services. Studies have been conducted on the knowledge of cervical cancer and screening behaviours in the south-west geopolitical region of Nigeria (Oluwole et al. 2017; Balogun et al. 2012; Bruni and Castellsagué 2009); however, there is a dearth of information for the northern region. This study was conducted to assess the knowledge of cervical cancer and barriers to cervical screening uptake among women of reproductive age in a city in Northern Nigeria.

Methods

Study area

The study was conducted in Gombe Local Government Area (LGA), Gombe state with a population of 266,844 with females of reproductive age, constituting 45% of the population (City Population 2017; National Population Commission 2006). Women aged 15 to 49 years were eligible for the survey. Though cervical cancer screening is recommended only for women aged 25–65, the study team decided to include females aged 15 to 24 years because they fall within the target population recommended for primary prevention, specifically health education on cervical cancer (Akinola et al. 2018); this group only answered questions on cervical cancer knowledge and attitude.

Sample size determination

The sample size for the study was calculated using the Leslie Kish formula for estimating sample size for single proportion ($n = z_\alpha^2 pq/d^2$) (Kish 2004) based on the prevalence of cervical cancer screening of 15.4% from a previous study in Zaria, Nigeria (Ahmed et al. 2013) at 95% confidence level, 5% margin of error, and degree of precision of 0.05. The minimum sample size was 201, and this was increased to 230 to adjust for non-response and increase the precision of the findings.

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Sampling technique

A multistage sampling technique was used to select 230 respondents, with a response rate of 96%. The local government is made up of 11 wards; we selected five out of the 11 wards using simple balloting (Bolari West, Nasarawo, Herwagana, Pantami, and Jekadafari wards). The second stage involved a random selection of two communities from each of the five wards (each ward is made up of communities). We enumerated households in the selected communities and purposively sampled households with women within the reproductive age range (15-49). If there was more than one eligible respondent, we selected the woman interviewed using simple balloting.

Instrument

A 43-item, interviewer-administered questionnaire was developed from the themes of the study objectives, which were determined by a preliminary review of literature on cervical cancer screening in Nigeria. The study objectives focused on an assessment of the knowledge, attitude, and practice of cervical screening, including barriers. The questionnaire was developed by adapting the validated cervical cancer awareness questionnaire (Cervical CAM) and other tools used for previous studies (University College London, 2017; Mabelele et al. 2018; Stuart et al. 2019; Liu et al. 2017; Mukama et al. 2017). The instrument had questions on the socio-demographic characteristics of the women, knowledge of cervical cancer, its signs, symptoms, risk factors, and screening methods. In addition, the questionnaire had questions on respondents' attitude towards cervical cancer screening, and practice of cervical cancer screening including age of first screening and regularity. Respondents who had ever been screened were asked reasons for screening, and those who had never screened also provided reasons for/barriers for not screening. The questionnaire was developed in English and later translated to Hausa; the common local language and this was used for data collection. The questionnaire was pretested in a similar community and administered by trained research assistants.

Knowledge of cervical cancer and cervical screening was measured on a 43-point scale. This comprised general knowledge of cervical cancer, knowledge of cervical cancer signs and symptoms, risk factors, and cervical screening procedure. Knowledge score (KS) of ≤ 15 was rated as poor knowledge, KS of $> 15 \leq 30$ was considered fair and KS >30 was rated as good knowledge. Attitude was measured on a nine-item scale which had both positively and negatively worded questions. The questions in the scale had three Likert scale response format: "agree", "disagree" and "undecided". Scores of ≤ 4 were classified as negative while those > 4 were categorised as positive attitude.

Practice/uptake of cervical cancer screening was a dichotomous variable of "Yes" or "No", and this information was obtained only from those aged 26 to 49 years old. Those who reported being screened by Pap smear or visual inspection with acetic acid, even if only once in their lifetime, were regarded as having uptake of cervical cancer screening and classified as "yes", while those who had never screened were regarded as having no uptake of screening and categorised as "No" (Ilevbare et al. 2020).

Statistical analysis

Data were analysed using descriptive statistics and presented using percentages and means with standard deviation. Chi-square (Fisher's exact test) was used to test for association between the categorical variables. Data was analysed using SPSS version 25.

Ethics

The Research Ethical Review Board of Gombe State Ministry of Health provided ethical approval for the study. Permission to conduct the study was also obtained from the Gombe Local Government Authority. Written informed consent was obtained from each study participant. For those aged less than 18 years, their parents or guardians provided written informed consent.

Results

There were 230 respondents; their ages ranged from 15 to 49 years, with a mean age of 29.6 years ± 8.06. Almost half of the respondents (48.7%) had completed tertiary-level education. Few [19 (8.3%)] of the respondents were unemployed (Table 1).

General knowledge of cervical cancer

Few (4.3%) of the respondents had good knowledge of cancer of the cervix; 46.5% had fair, while 49.1% had poor knowledge. Over half [118 (51.3%)] of the respondents did not know that HPV infection was the major cause of cervical cancer, and 183 (79.6%) of the respondents knew that cervical cancer is curable if detected early. With regard to screening, 91 (39.6%) incorrectly stated that cervical cancer screening should be done only once in a woman's lifetime to eliminate the risk of cervical cancer (Table 2).

Knowledge of cervical cancer signs and symptoms

Knowledge of cervical cancer signs and symptoms was low; only 25 (10.9%) knew that irregular menstruation is a sign of cervical cancer, most [176 (76.5%)] of the respondents did not

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Table 1 Socio-demographic characteristics of the respondents ($N = 230$)

	Variable	Frequency	Percent (%)
Age (years)	15 – 19	12	5.2
	20 – 24	57	24.8
	25 – 29	69	30.0
	30 – 34	31	13.5
	35 – 39	21	9.1
	40 – 44	22	9.6
	45 – 49	18	7.8
Religion	Islam	121	52.6
	Christianity	103	44.8
	No response	6	2.6
Marital status	Single	86	37.4
	Married	130	56.5
	Divorced	7	3.0
	Widowed	5	2.2
	No response	2	0.9
Level of education	No formal education	17	7.4
	Primary	18	7.8
	Secondary	79	34.3
	Tertiary	112	48.7
	No response	4	1.7
Husband education	No formal education	8	3.5
	Primary	11	4.8
	Secondary	22	14.3
	Tertiary	79	34.3
Occupation	Civil servant/professional	71	30.9
	House wife	44	19.1
	Trader/artisan/laborer	38	16.5
	Student	44	19.1
	Unemployed	19	8.3
	No response	14	6.1
Type of marriage	Polygamy	35	29.7
	Monogamy	83	70.3
Number of children	1	18	7.8
	2	24	10.4
	3	28	12
	4	21	9.1
	5 – 13	41	17.8
	No response	98	42.6
Period of marriage (in years)	1 – 10	70	30.4
	11 – 20	45	19.6
	21 – 30	14	6.1
	31 – 40	4	1.7
	No response	97	42.0
Average income (₦)	0–5000 ($0–$16.39)	65	28.3
	5001–10,000 ($16.40–$32.79)	42	18.3
	≥ 10,001 (> $32.80)	94	40.9
Family history of cervical cancer	Yes	24	10.4
	No	165	84.8
	Do not know	11	4.8

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Table 2 Knowledge of cervical cancer ($N = 230$)

General knowledge of cervical cancer	Frequency (%)		
	Yes	No	Do not know
Ever heard of cancer of the cervix?	230 (100)		
Cervical cancer can lead to death	199 (86.5)*	25 (10.9)	6 (2.6)
HPV infection has been identified as the major cause of cervical cancer.	105 (45.7)*	118 (51.3)	7 (3.0)
HPV vaccine guarantees 100% protection/prevention from cervical cancer	97 (42.2)*	126 (54.9)	7(3.0)
Screening for cervical cancer helps in early diagnosis of cervical cancer	201 (87.4)*	23 (10.0%)	5 (2.2)
It is sufficient to do the cervical cancer screening only once in a woman's lifetime to eliminate the risk of cervical cancer	91 (39.6)	134 (58.3)*	5 (2.2)
Cervical cancer is a genetic disease	113 (49.1)*	110 (47.8)	6 (2.6)
Cervical cancer can be detected in its earliest stages	171 (74.3)*	54 (23.5)	5 (2.2)
Cervical cancer is curable if detected early	183 (79.6)*	41 (17.8)	6 (2.6)
Postmenopausal women still have the risk of getting cervical cancer	170 (73.9)*	54 (23.5)	6 (2.6)
Cervical precancerous lesions may be detected by screening	162 (70.4)*	60 (26.1)	8 (3.5)
Having multiple sexual partners can increase a woman's risk of having cervical cancer	179 (77.8)*	44 (19.1)	6 (2.6)
Family history of cervical cancer increases a woman's risk of having cervical cancer	146 (63.5)*	79 (34.3)	5 (2.2)
A woman should not have sex 24 h before having pap smear	133 (57.8)*	92 (40.0)	5 (2.2)
Pap smears can be performed during both menstrual and non-menstrual period	108 (47.0)*	113 (49.1)	9 (3.9)
Knowledge of cervical cancer signs and symptoms			
Irregular menstruation	25 (10.9)*	202 (87.8)	3 (1.3)
Bleeding between periods	31 (13.5)*	197 (85.7)	2 (.9)
Foul-smelling vaginal discharge	61 (26.5)*	168 (73.0)	1 (.4)
Longer and heavier menstrual flow	30 (13.0)*	197 (85.7)	3 (1.3)
Post-menopausal bleeding	28 (12.4)*	198 (86.1)	4 (1.7)
Itching at the vagina	59 (26.7)*	153 (66.5)	18 (7.8)
Bleeding after intercourse	30 (13.0)*	176 (76.5)	24 (10.4)
Painful menstruation/pain in the pelvic area	16 (7.0)*	190 (82.6)	24.(10.4)
Severe bleeding	53 (23.0)*	161 (70.0)	16.(7.0)

The symbol * signifies the correct response for the various questions

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identify bleeding after intercourse as a sign of cervical cancer (Table 2). Furthermore, 28 (12.4) knew post-menopausal bleeding was a sign/symptom of cervical cancer while 30 (13%) and 31 (13.5%) identified longer and heavier menstrual flow and bleeding between periods respectively (Table 2).

Knowledge of cervical cancer risk factors and screening methods

Some 77 (33.5%) of the respondents identified high numbers of sexual partners as a risk factor for cancer of the cervix. Few [59 (25.7%)] identified family history of the diseases as a risk factor; 52 (22.6%) identified HPV infection and 82 (35.7%) mentioned previous history of sexually transmitted infections as risk factors for cancer of the cervix (Table 3). Only 15.2% knew a screening method for cervical cancer (Table 3).

Attitude to cervical cancer screening

Many (52.2%) of the respondents had a positive attitude towards cervical cancer screening. A few [71(30.9%)] of the respondents agreed that they were not confident to ask questions from the healthcare providers at the clinics regarding cervical cancer screening, and 75 (32.6%) agreed that if a male healthcare provider performed the cervical cancer screening test, they would feel embarrassed. See Table 4.

Factors influencing cervical cancer screening and prevention

Only 15 (9.5%) of the respondents aged 25 to 49 years had ever had cervical cancer screening, out of which 15 (100%) conducted a Pap smear test, and five (33.3%) of the respondents had their screening ≤ 12 months before. Thirteen (86.7%) were screened at a health facility. Also, 11(73.3%)

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Table 3 Knowledge of cervical cancer risk factors and screening procedure ($N = 230$)

Risk factors	Frequency (%)	
	Yes	No
Having sex with uncircumcised male partner	43 (18.7)*	187 (81.3)
Old age	29 (12.6)*	201 (87.4)
Family history of cervical cancer	59 (25.7)*	171 (74.3)
Low socioeconomic status	25 (10.9)	205 (89.1)*
Spiritual attack	36 (15.7)	194 (84.4)*
Unhealthy diet	46 (20.0)	184 (80.0)*
High numbers of sexual partners	77 (33.5)*	153 (66.5)
High rates of abortion	65 (28.3)*	165 (71.7)
HPV infection	52 (22.6)*	170 (77.4)
Early age of sexual debut	52 (22.6)*	178 (77.3)
Previous history of sexually transmitted diseases	82 (35.7)*	148 (64.3)
Tobacco use	36 (15.7)*	194 (84.3)
Poor menstrual hygiene	61 (26.5)*	169 (73.5)
Prolong use of birth control pills	54 (23.5)*	176 (76.5)
High rate of pregnancy	51 (22.2)*	179 (77.8)
Unprotected sexual intercourse	76 (33.1)*	154 (66.9)
Human immunodeficiency syndrome	40 (17.4)*	190 (82.6)
Living with a cervical cancer patient	22 (9.6)	207 (90.4)*
Knowledge about any cervical cancer screening procedure		
Yes	35 (15.2%)	
No	195 (84.8%)	
If yes, which one?		
Pap smear test	33 (14.3%)	
VIA (visual inspection using acetic acid)	1 (0.4%)	
Biopsy	1 (0.4%)	
When a female should start screening for cervical cancer		
From 25 years and above	83 (36.1%)	
After menopause.	3 (1.3%)	
When one gets symptoms of cancer of the cervix	19 (8.0%)	
When one gets sexually transmitted infection.	12 (5.2%)	
When one becomes sexually active	36 (15.7%)	
I do not know	77 (33.5%)	
Benefit of cervical cancer screening		
To be safe/to know my status/early detection	134 (58.3%)	
Prevent cervical cancer	16 (7.0%)	
To get early treatment	2 (0.9%)	
I do not know	78 (33.9%)	

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indicated that they had been screened only once in their life; eight (53.3%) of these were aged 25 to 27 years, while three (20.0%) were aged 28 to 30 years (Table 5).

For respondents who had screened, the main reasons for the uptake of cervical cancer screening was the need to adopt preventive practices [seven (46.7%)] and health worker's recommendation [three (20.0%)]. Health facility-related barriers to the uptake of screening as mentioned by those who had not screened were; cervical screening not recommended by their doctor or a nurse [61(45.0%)], lack of clinics where it is done in their communities [46 (31.5%)] and the cost [42 (28.8%)]. Other individual-level barriers mentioned were; respondents' perception that they were healthy and the test was unnecessary [48 (32.8%)], poor awareness about the test [47 (32.2%)], and fear of testing positive [31(21.2%)].

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Table 4 Attitude to cervical cancer screening ($N = 230$)

Statement	Agreed	Disagreed	Undecided
I am not confident to ask questions from the healthcare providers at the clinics regarding cervical cancer screening	71 (30.9%)	145 (63.0%)	14 (6.1%)
If a male healthcare provider performed the cervical cancer screening test, I would feel embarrassed	75 (32.6%)	143 (62.2%)	12 (5.2%)
Practicing cervical cancer screening can help in detecting cervical cancer early	76 (33.0%)	132 (57.4%)	22 (9.8%)
Doing a cervical cancer test cannot prevent women from having cervical cancer	99 (43.0%)	102 (44.3%)	29 (20.7%)
I believe going for cervical cancer screening is unnecessary if there are no signs and symptoms	39 (17.0%)	113 (49.1%)	78 (33.9%)
I am of the opinion that going for cervical cancer screening is too expensive	74 (32.2%)	93 (40.4%)	63 (27.4%)
I do not believe that something wrong will be detected if I go for cervical cancer screening	68 (29.6%)	114 (49.6%)	48 (20.8%)
I am not at risk of cervical cancer so there is no need to be screened	41 (17.8%)	147 (63.9%)	42 (18.2%)
I am spiritually protected so there is no need for cervical cancer screening	39 (17.0%)	140 (60.9%)	51 (22.1%)

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Factors associated with cervical cancer screening among women aged 25 years and above

The result of the Fisher exact test at 0.05 level of significance showed that there was an association between level of income and utilisation of cervical cancer screening services. Just a few [12(14.3%)] of the respondents who earned over N10,000 (> $32.80) had utilised cervical cancer screening services, compared to two (7.7%) of the respondents who earned ₦5,001–₦10,000 ($16.40–$32.79) ($p = 0.037$). The utilisation of cervical cancer screening services was higher among women who had tertiary-level education [13 (15.3%)] compared to those without formal education [one (6.3%)] ($p = 0.048$) and among those with healthcare facilities for cervical cancer screening in their communities [15 (100%)] ($p = .000$) (Table 6).

Discussion

This study assessed the knowledge of cervical cancer and barriers to cervical screening uptake among women of reproductive age in a city in Northern Nigeria. Our findings revealed that with regard to the general issues on cervical cancer, the majority of the women had relatively good knowledge; however, there was a significant dearth in the knowledge of the signs and symptoms for the disease and its risk factors. For instance, few knew the signs and symptoms of cancer of the cervix, including bleeding between periods, foul-smelling vaginal discharge, longer and heavier flow, bleeding after intercourse, and post-menopausal bleeding. This is a major challenge, because knowledge of the signs and symptoms of the disease is critical for its early detection, especially in a population with limited access to cervical screening facilities. Poor knowledge of the signs and symptoms of cervical cancer also has grave implications on the health-seeking behaviors of women, as revealed in studies conducted in other countries (Chadza et al. 2012; Mukama et al. 2017; Habtu et al. 2018). This may be a major factor contributing to late presentation/detection of the disease resulting in increasing rates of cervical cancer mortality. Furthermore, the majority of the women did not know the risk factors for the disease; for instance, less than a quarter knew that early sexual debut and HPV infection were risk factors. In addition, only a third identified unprotected sexual intercourse, previous history of sexually transmitted infections, and multiple sexual partnership as risk factors. The poor knowledge of the risk factors among the women may hinder the adoption of healthy behaviours to reduce their risk of developing the disease. The gaps in knowledge of the signs are supported by previous studies (Ahmed et al. 2013; Jemal et al. 2012), which reveals the urgent need for educational interventions to increase knowledge and improve the health-seeking behaviors of women in Northern Nigeria.

Findings from this study revealed that overall, over half of the respondents had a positive attitude towards screening for cervical cancer screening and prevention, and this was associated with the uptake of cervical screening. However, a significant proportion of the respondents expressed some negative perceptions, which may hinder the uptake of cervical cancer. For instance, almost a third of the respondents expressed that if a male healthcare provider performed the cervical cancer screening test, they would feel embarrassed. Furthermore, only a third opined that participation in cervical screening can help in the early detection of cervical cancer, while almost half (43%) believed that cervical cancer

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Table 5 Practice of cervical cancer screening for women aged 25 years and above ($N = 161$)

Practice of cervical cancer screening	Number (%)
Ever conducted cervical cancer screening?	
Yes	15 (9.5)
No	146 (90.7)
Cervical cancer screening conducted (n =15)	
Pap smear test	15 (100.0)
When cervical cancer screening was done (n=15)	
< 12 months	5 (33.3)
> 12 months<36 months	6 (40.0)
> 36 months to < 10 years	4 (26.7)
Where cervical cancer screening was done (n=15)	
At a health facility	13 (86.7)
During special events or outreach by NGOs or religious organisations	2 (13.3)
Age at first cervical cancer screening (n=15)	
25–39	13 (86.7%)
40–65	2 (13.3%)
How often do you go for cervical cancer screening?	
In my life time, have only been screened once (aged 25–27 years)	8 (53.3%)
In my life time, have only been screened once (aged 28–30 years)	3 (20.0%)
Yearly (31-40 years)	3 (20.0.0%)
Every 2 years (45 years)	1 (6.7%)
Ever taken HPV vaccine for the protection against cervical cancer?	
Yes	2 (1.2%)
No	159 (98.8%)
Dosage(s) of HPV vaccine taken (n =3)	
One dose	2 (100.0%)
Respondents' reasons for going for cervical cancer screening (n=15)	
Preventive measures	7 (46.7)
Advice from family and friends	1 (6.7)
Health worker's recommendation	3 (20.0)
There was free cervical cancer screening by NGOs/religious organisation	2 (13.3)
Child birth problem	1 (6.7)
Infection	1 (6.7)
Reasons for not going for cervical cancer screening (n =146)	
Health facility-related barriers	
Not suggested by my doctor or a nurse	61 (41.8)
Lack of clinics where cervical cancer screening is done in my community	46 (31.5)
The tests are very expensive.	42 (28.8)
Services are offered at the big hospitals and it is expensive to reach there	36 (24.7)
Attitude of health care workers	27 (18.5)
Absence of female healthcare workers as screeners	20 (13.7)
Barriers at the intrapersonal and interpersonal levels	
I'm healthy so it's not necessary	48 (32.8)
I was unaware of the test	47 (32.2)
I am afraid of being screened positive for cervical cancer	31 (21.2)
Fear of the procedure	31 (21.2)
I do not want to expose my private parts for the screening	24 (16.4)
Lack of support from partner/husband or others (friends, sisters, etc.)	20 (13.7)
I am afraid of what people will say if I am screened positive	19 (13.0)
My partner will not want me to do cervical cancer screening	17 (11.6)
Cultural/religious reason	4 (2.7)

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Table 6 Association between respondents' socio-demographic (level of income, level of education, religion) characteristics and utilization of cervical cancer screening services

Variable	Utilisation of cervical cancer screening services		Fisher's exact test	*P* value	df
	Yes	No			
Level of income					
0–5000 ($0-$16.39)	0 (0.0%)	34 (100%)	6.127	0.037	2
5001–10,000 ($16.40–$32.79)	2 (7.7%)	24 (92.3%)			
$\geq$ 10,001 (> $32.80)	12 (14.3%)	72 (85.7%)			
Level of education					
No formal	1 (6.7%)	14 (93.3%)	6.897	0.048	3
Primary	0 (0.0%)	16 (100%)			
Secondary	1 (2.3%)	43 (97.7%)			
Tertiary	13 (15.3%)	72 (84.7%)			
Religion					
Islam	4 (4.7%)	82 (95.3%)	–	0.035	1
Christianity	10 (14.3%)	60 (85.7%)			
Knowledge					
Low	5 (6.8%)	68 (93.2%)	1.244	0.529	2
Fair	9 (11.4%)	70 (88.6%)			
High	1 (11.1%)	8 (88.9%)			
Attitude towards cervical cancer screening					
Poor	1 (2.5%)	39 (97.5%)	6.035	0.049	–
Fair	8 (8.7%)	84 (91.3%)			
Good	6 (20.7)	23 (79.3)			
Availability of healthcare facility for cervical cancer screening in respondents' communities					
Yes	15 (100)	0 (0.0)	–	0.000	–
No	0 (0.0)	146 (100)			

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screening cannot prevent cervical cancer in women. Similar findings have been reported elsewhere in Nigeria (Modibbo et al. 2016; Idowu et al. 2016; Ahmed et al. 2013; Abiodun et al. 2013; Omotara et al. 2013), and this has greatly impacted the uptake of cervical screening (Mukama et al. 2017; Tapera et al. 2019). This negative attitude underscores the need for multi-media behavioral communication interventions, which has been found to be effective in influencing women's attitude and perceptions about cervical cancer and screening in Nigeria (Abiodun et al. 2014).

Cervical screening uptake is influenced by several intricate factors, ranging from intrapersonal, interpersonal, and healthcare system-related factors, and these aligned with barriers reported by the respondents. Our results revealed that the uptake of cervical screening was very low and positively associated with educational level and income. This is not surprising; educated women with a high income are expected to have a better understanding of the disease and as such can demand screening services. This reveals underlying inequities in cervical cancer screening utilisation, and justifies the need for targeted interventions to reach disadvantaged groups. Other intrapersonal factors as expressed by the respondents were the perception that they were healthy and hence cervical cancer screening is not necessary, lack of awareness about the test, fear of being screened and found positive, fear of the procedure, and a desire not to expose their private parts for the screening. Several approaches can be adopted to address these issues. For instance, female screeners may be trained to collect the samples, and health workers can be trained to provide counseling support to women to allay their fears with regard to the screening procedures and outcomes. In addition, cervical cancer screening programmes can incorporate HPV self-sampling, which has been found to eliminate the embarrassment and fear females had from pelvic examination by a clinician and to improve cervical screening uptake (Modibbo et al. 2017; Oketch et al. 2019).

The interpersonal factors mentioned were lack of support from significant others and fear of people's reaction if they test positive. Published studies in countries have linked partner support with cervical cancer service utilisation (Asuzu et al. 2014; Morema et al. 2014; Lyimo and Beran 2012; Assefa et al. 2019). The study by Asuzu et al. 2014 in Ibadan, Nigeria revealed that over 70% of the male respondents had a good knowledge of cervical cancer-related issues; however, only slightly over half (55%) would encourage their wives to screen for cervical cancer (Asuzu et al. 2014). In view of this,

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there is need for interventions to promote the active involvement of male partners to improve support for their partners.

Availability of healthcare facilities for screening was also associated with screening. Health facility factors identified as barriers were limited availability of health facilities where cervical cancer screening can be done in their communities, while a few said the tests were very expensive. This was similar to findings in a study conducted in Uganda (Ndejjo et al. 2017). Other reasons stated by respondents include the attitude of healthcare workers and test not recommended by a doctor or a nurse. These are health facility factors which need to be addressed with appropriate interventions to increase the uptake of screening. Accessibility, availability, affordability, and acceptability of cervical cancer screening services are largely dependent on the health system, with a major role played by health workers and funds deployed into the health system by the government. These findings underscore the need for a well-functioning health system coupled with community outreach services to improve cervical screening. Of import is the need to train health workers, especially female screeners, provide supplies and logistics to provide quality screening services (Ndejjo et al. 2017), and implement counselling training sessions to improve provider–patient communication on cervical cancer.

The key limitation of the study is the failure to use qualitative methods to explore other factors and barriers which may influence and deepen understanding on cervical cancer screening in Nigeria.

Conclusion

This study has contributed to information on the knowledge of cervical cancer among women of reproductive age in a city in Northern Nigeria, and barriers to cervical screening uptake. These highlight the need for multi-component, multi-level interventions in Northern Nigeria to improve knowledge on the benefits of cervical screening. Targeted interventions on the identified barriers are the key steps to eliminate the challenges to cervical screening utilization.

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Declarations

Conflicts of interest/competing interests All authors disclose no conflict of interest.

Ethics approval The Research Ethical Review Board of Gombe State Ministry of Health, Nigeria provided ethical approval for the study. Ethical committee reference number: MOH/ADM 5638.

Consent to participate Written informed consent was obtained from all respondents included in the study. For those aged less than 18 years, their parents/guardians provided written informed consent.

Consent for publication Not Applicable.

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