

ORIGINAL RESEARCH ARTICLE

Environmental and psychosocial predictors of cervical cancer screening among women in Gwagwalada Area Council, Abuja, North Central, Nigeria

DOI: 10.29063/ajrh2023/v27i7.4

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Abstract

Cervical cancer (CC) is the second leading cause of cancer morbidity and mortality among Nigerian women. Although screening is a cost-effective strategy for reducing its burden, uptake remains sub-optimal. A descriptive cross-sectional study was conducted among 514 sexually active women aged ≥ 25 years in Gwagwalada Area Council, Abuja, Nigeria using a semi-structured interviewer administered questionnaire. Mean age of respondents was 38.4 ± 11.6 years. 246 (46.9%) had good knowledge of CC screening while 268 (51.2%) had poor knowledge. Religion (aOR:1.8 [95% CI: 1.1 - 3.1]), location (aOR:1.2 [95% CI: 1.2 - 3.4]) and number of children (aOR:2.3 [95% CI: 1.3 - 3.9]) were predictors for screening. Poor access routes to health facilities (aOR:0.5 [95% CI: 0.2 - 0.9]), high cost of screening (aOR:0.4 [95% CI: 0.2 - 0.9]), unaware of screening centers (aOR:0.4 [95% CI: 0.2 - 0.9]) and long waiting hours (aOR:0.5 [95% CI: 0.2 - 0.9]) were identified environmental predictors. Fear of positive diagnosis/stigma (aOR:0.3 [95% CI: 0.1 - 0.9]), unacceptable touch (aOR:0.2 [95% CI: 0.1 - 0.8]), deficiency in awareness programs (aOR:0.3 [95% CI: 0.2 - 0.7]), and not aware of appropriate screening age (aOR:0.1 [95% CI: 0.1 - 0.4]) were identified psychosocial predictors. This study highlights the need to intensify enlightenment programs, subsidize screening services, and encourage community screening. (*Afr J Reprod Health* 2023; 27 [7]: 32-42).

Keywords: Cervical cancer, screening, environmental barriers, psychosocial barriers

Résumé

Le cancer du col de l'utérus (CC) est la deuxième cause de morbidité et de mortalité par cancer chez les femmes nigérianes. Bien que le dépistage soit une stratégie rentable pour réduire son fardeau, son utilisation reste sous-optimale. Une étude transversale descriptive a été menée auprès de 514 femmes sexuellement actives âgées de ≥ 25 ans dans le conseil régional de Gwagwalada, à Abuja, au Nigeria, à l'aide d'un questionnaire semi-structuré administré par un intervieweur. L'âge moyen des répondants était de $38,4 \pm 11,6$ ans. 246 (46,9 %) avaient une bonne connaissance du dépistage du CC tandis que 268 (51,2 %) avaient une mauvaise connaissance. La religion (ORa : 1,8 [IC à 95 % : 1,1 - 3,1]), la localisation (ORa : 1,2 [IC à 95 % : 1,2 - 3,4]) et le nombre d'enfants (ORa : 2,3 [IC à 95 % : 1,3 - 3,9]) étaient des prédicteurs pour le dépistage. Mauvaise voie d'accès aux structures de santé (ORa : 0,5 [IC 95 % : 0,2 - 0,9]), coût élevé du dépistage (ORa : 0,4 [IC 95 % : 0,2 - 0,9]), méconnaissance des centres de dépistage (ORa : 0,4 [95 % IC : 0,2 - 0,9]) et les longues heures d'attente (ORa : 0,5 [IC à 95 % : 0,2 - 0,9]) ont été identifiés comme prédicteurs environnementaux. Peur d'un diagnostic positif/stigmatisation (ORa : 0,3 [IC à 95 % : 0,1 - 0,9]), toucher inacceptable (ORa : 0,2 [IC à 95 % : 0,1 - 0,8]), carence dans les programmes de sensibilisation (ORa : 0,3 [IC à 95 % : 0,2 - 0,7]), et ne connaissant pas l'âge approprié pour le dépistage (ORa : 0,1 [IC à 95 % : 0,1 - 0,4]) ont été des prédicteurs psychosociaux identifiés. Cette étude souligne la nécessité d'intensifier les programmes d'éducation, de subventionner les services de dépistage et d'encourager le dépistage communautaire. (*Afr J Reprod Health* 2023; 27 [7]: 32-42).

Mots-clés: Cancer du col de l'utérus, dépistage, barrières environnementales, barrières psychosociales

Introduction

The global cancer burden is estimated to have risen to 18.1 million new cases and 9.6 million deaths in 2018¹. One in six women worldwide develop cancer

during their lifetime and one in eleven women die from the disease. Cervical cancer ranks fourth for both incidence (6.6%) and mortality (7.5%)¹⁻². In Nigeria, an estimated 10,000 new cases of cervical cancer and 8000 deaths due to the disease are

recorded among women yearly³⁻⁴. Moreover, Nigeria has an estimated five-year prevalence of 21.6% for cervical cancer as published in GLOBOCAN fact sheets of 2012². Cancer of the cervix can be prevented by providing widespread and regular cervical screening services for all women who have been sexually active. This is done by the Human Papilloma Virus (HPV) test, Pap test or the Visual Inspection with Acetic Acid test (VIA) which is affordable and more sensitive⁵⁻⁶. The One-Visit Approach – screening with VIA by trained personnel and provision of cryotherapy for obvious mild to moderate cervical dysplasia is recommended for developing countries⁷.

Studies have shown that cervical cancer screening approaches and particularly the pap smear tests decrease the annual worldwide mortality rates associated with cervical cancer by approximately 2% each year since its introduction in 1941⁷. Despite this evidence, utilization of screening services remains abysmally low⁸⁻⁹. Significant number of women in Nigeria, though aware of health risks in cervical cancer still ignore the preventive actions of screening resulting in deaths. Studies have shown that, most patients with cervical cancer usually present late in the hospital after receiving different kinds of treatments at home¹⁰. It has been observed that certain socio cultural, religious, genetic and economic factors may be responsible for this negative attitude⁸.

Creating awareness, identifying the barriers to cervical cancer screening, and tackling them will encourage women to attend screening and prevent cervical cancer. The purpose of this study therefore was to examine environmental and psychosocial barriers that influence cervical cancer screening uptake. Though reasons for poor utilization have been explored in other parts of Nigeria, not much has been done in the study area and little has been done in relation to environmental and psychosocial barriers to screening. Most studies also utilized qualitative approach in documenting perceived barriers to uptake of services, thereby getting group perception about the subject and not individual perceived barriers. It is against this backdrop that this study was conducted to ascertain barriers to cervical screening among women in the Gwagwalada area council of the Federal Capital Territory (FCT).

Conceptual framework on environmental and psychosocial predictors of cervical cancer screening among women

Conceptual framework is defined as a network, or “a plane,” of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena. Researchers have used a variety of theoretical frameworks to identify and classify the determinants of cancer screening and to ground behavioral interventions. For this study, the PRECEDE/PROCEED model provided a conceptual framework. PRECEDE/PROCEED brings together social, epidemiologic, behavioral, environmental, educational, and organizational views of a health problem within a community context. The acronym PRECEDE—which stands for Predisposing, Reinforcing, and Enabling Constructs in Educational/Environmental Diagnosis and Evaluation—is based on the premise that educational diagnosis should precede an intervention plan. The PROCEED—Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development—part of the framework recognizes the contribution of environment as a determinant of health-seeking behavior¹¹⁻¹².

This model asserts that *predisposing*, *reinforcing*, and *enabling* factors influence the likelihood that behavioral and environmental change will occur. Predisposing factors are antecedents to behavior that provide the motivation for that behavior. These include individuals’ knowledge, attitudes, and beliefs, as well as certain sociodemographic characteristics. Enabling factors are antecedents to behavior that allow the motivation to be realized, such as cost, availability of transportation, and other environmental issues. Reinforcing factors are those that follow a behavior and provide continuing reward or incentive for the behavior. Examples include social support, physician/patient relationship, and peer influence¹¹. In the current study, environmental and psychological predictors of cervical screening among women were examined. Using the above model, predisposing, reinforcing, and enabling factors of environmental and psychosocial predictors of cervical screening are illustrated in Figure 1.

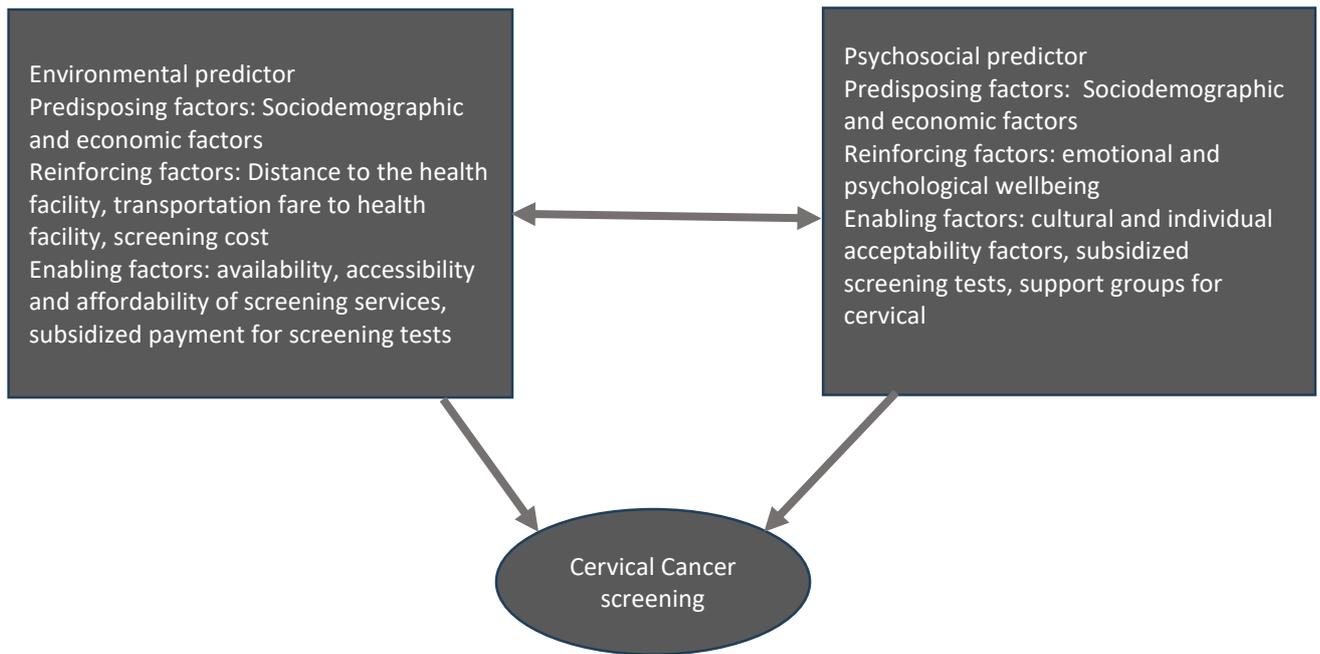


Figure 1: Conceptual framework on environmental and psychosocial predictors of cervical screening

Methods

Study design and setting

A cross sectional descriptive survey research design was adopted to determine the environmental and psychosocial barriers to cervical cancer screening among sexually active women aged 25 years and above in Gwagwalada Area Council, FCT, Abuja. The study area is a rapidly growing satellite town of the with an area of 1069.589 km² and a population figure of 158,618 people at the 2006 census. With a national population growth rate of 3.2%¹³, the total population of people in the area council is 238,885 as at 2019. According to¹³, women of childbearing age represent 24% of the total population, therefore a total of 52, 555 women of childbearing age are present in the study area. The inhabitants of the LGA have different religious affiliations such as Islam, Christianity, and Traditional religions. The predominant occupations of the inhabitants of the town include farming and trading but a good proportion of the people are civil servants.

Eligibility criteria

a. Inclusion criteria for participants:

Women aged 25 years and above, sexually active, residing in Gwagwalada Area Council, FCT in not

less than 6 months and who gave their consent to participate in the study.

b. Exclusion criteria for participants:

Women who have been diagnosed of cervical cancer and women not consenting to participate were exempted from the study.

Sample size

The sample size was determined using Fisher's formula for estimating single proportions and the formula for estimating the minimum sample size. The standard normal deviation was set at a 95% confidence level, with the allowable margin of error of 5%. The Fisher's formula

$$n = \frac{Z^2 P(1-P)}{d^2} \quad \text{Where:}$$

n = minimum required sample size in population greater than 10,000, (n=52,555; Women of childbearing age in Gwagwalada Area Council)

Z = Standard normal variate for 95% confidence level, (Z = 1.96)

d = acceptable difference; using 5% (d = 0.05)

q = 1 - p

Based on documentation of previous study conducted in Nigeria by¹⁴, a proportion of 18.03% will be adopted in this study as the percentage of cervical cancer screening uptake by women in Nigeria.

$$n = \frac{(1.96)^2 0.1803(1 - 0.1803)}{(0.05)^2} = 227.10$$

DEFF= Multiplying the sample size by 2 (Cluster design effect in conformity with WHO standard)

Minimum sample size (n) = 227.10 x 2 = 454.2

A 10% non-response rate is anticipated.

454.2 + 45.42 = 499.62

A total of 517 questionnaires were administered for this study.

Sampling technique

A multistage sampling technique was employed in the selection of respondents.

Stage 1: A sampling frame of all the wards in Gwagwalada Area Council was documented. Using simple random technique by balloting, two of the total ten wards in Gwagwalada Area Council were selected. Kutunku and Gwagwalada central wards were selected for the study.

Stage 2: In the selected wards (2), two rural communities and two urban communities were also selected using simple random technique by balloting, from each of the wards. A total of 8 communities were used for the study. From Kutunku ward, New Kuntuku and compensation layout were selected as urban communities and Old Kuntuku as well as Old Kaida were selected as rural communities. For Gwagwalada central ward, Angwan Tiv and Passo were selected as rural communities while Dagiri and Angwan Shanu were selected as urban communities.

Stage 3: Using the WHO cluster sampling technique, the first house in each community was randomly selected. The center of the community was located and a bottle/pen spinned on the ground to determine the first house to participate in the study. Two houses were subsequently skipped until the number of required respondents were reached.

Stage 4: For each house, all the households were sampled. A household was defined as people eating from a common pot.

Stage 5: For household sampled with more than one eligible respondent, line list of all eligible respondent was done, and one eligible respondent was randomly selected by balloting and interviewed.

NOTE: For households with no eligible respondent, the interviewer exited the household and sampled the immediate next available household to the right

and continued the survey. The survey continued until the sample size was achieved.

Study instrument

Primary data was collected from the respondents using a semi-structured interviewer administered questionnaire using open data kit (ODK). The questionnaire was developed based on information obtained from previous studies on cervical cancer screening. Data on socio demographic characteristics, knowledge on cervical cancer, practice of screening and environmental/psychosocial barriers to cervical cancer screening were collected. Face-to face interviews were carried out on all respondents.

Data management

After collection of data, the instrument was checked for completeness and clarity¹⁵⁻¹⁶. Data collected was cleaned and consistency checks done before analysis to ensure accuracy. Data was processed using IBM Statistical Packages for Social Sciences (SPSS) Version 23. Frequency distributions, percentages, mean score, standard deviation and charts were computed and tabulated. Chi square was employed for bivariate analysis of data collected. Multivariate (binary logistics regression) was done to determine the predictors of knowledge and CC screening. The level of significance was set at P<0.05 and CI of 95%. For each question based on knowledge and attitude, a score of one was given for a correct answer, whereas a zero score was given for incorrect and do not know responses. Questions on the knowledge part were rated and a total score obtained. The median score was then computed. Those with a total score below the median were classified as having poor knowledge or attitude, whereas those with score equal to and above the median were considered to have good knowledge.

Ethics statement

Ethical clearance was obtained from FCT Health Research Ethics Committee (Approval Number: FHREC/2020/01/08/10-02-20). Verbal informed consent was sought and obtained from each respondent before administration of the questionnaire. Ethical issues like confidentiality, opportunity to decline interview at any stage and non-exposure to risk was also discussed with each

respondent. Participation in the study was voluntary. To ensure confidentiality of information, questionnaires were filled out anonymously.

Results

Five hundred and seventeen (517) research instruments were administered and five hundred and fourteen (514) were retrieved from respondents, giving a response rate of 99.4%. The mean age of respondents was 38.36 ± 11.6 years. While 179 (34.8%) of the respondents were between ages 21-30, 174 (33.9%) were above 40 years of age. A greater percentage of the respondents 340 (66.1%) were married with 360 (70.0%) having a monogamous family type and 385 (74.9%) had between 2-3 children. 173 (33.7%) had secondary education attainments while 82 (16%) had no formal education. 38.5% of the respondents had spouses with secondary education as the highest educational qualification while 7.2% of their husbands had no formal education. More than half 300 (58.4%) were Christians and 258 (50.2%) resided in rural communities. 183 (35.6%) of the respondents were traders/farmers with 308 (59.9%) earning less than 10,000 naira monthly. About 4.1% of the respondents were professionals (Bankers, Lawyers etc) and 13% were students. Only 14 (2.7%) of the respondents earned above 100,000.

Findings showed that 231 (44.8%) of the respondents have heard of cervical cancer. Their major source of information was the hospital and the media. 6(1.2%) had family members who had been diagnosed of cervical cancer. The main cervical cancer screening method known by respondents was pap smear 31 (6%) while 465 (90.5%) were not aware of any cervical cancer screening method. Assessment of respondents' knowledge on risk factors and signs and symptoms showed that 246 (46.9%) of the respondents had good knowledge while 268 (52.1%) had poor knowledge about cervical cancer.

Bivariate analysis to determine association between respondents' knowledge and socio demographic characteristics showed that educational status, religion, occupation, monthly income, location, and number of children were found to be statistically significant ($p < 0.05$). Table 2 below shows the multivariate analysis using binary logistic regression to determine predictors of knowledge of cervical cancer screening. Analysis

Table 1: Socio-demographic characteristics of respondents

Variables	Frequency (n)	Percentage (%)
Age (years)		
21-30	179	34.8
31-40	161	31.3
>40	174	33.9
Marital status		
Married	340	66.1
Single	74	14.4
Divorced	19	3.7
Widowed	46	8.9
Separated	24	4.7
Others	11	2.1
Family type		
Monogamy	360	70.0
Polygamy	134	29.9
Highest level of education		
No formal education	82	16.0
Primary	99	19.3
Secondary	173	33.7
Tertiary	160	31.1
Religion		
Christianity	300	58.4
Islam	197	38.3
Traditional	17	3.3
Location		
Rural	258	50.2
Urban	256	49.8
No of children		
≤ 1	41	7.9
2-3	385	74.9
≥ 4	88	17.1
Occupational status		
Student	67	13.0
Artisan	99	19.3
Civil servants	76	14.8
Traders/Farmers	183	35.6
Professionals	21	4.1
Unemployed	68	13.2
Monthly income (Naira)		
<10,000	308	59.9
10,000-50,000	128	24.9
50,000-100,000	27	5.3
> 100,000	14	2.7
No income	37	7.2
Mean age=38.36 ± 11.6 years		

showed that level of education (aOR:2.0 (95% CI: 1.5 - 3.6)), occupational status (aOR:2.3 (95% CI: 1.9 - 3.6)) and location (aOR:2.0 (95% CI: 1.3 - 3.5)) were found to be predictors of screening knowledge. It therefore follows that individual with formal education, employed workers and persons living in urban areas are more likely to have good knowledge on screening.

Figure 2 shows the utilization rate by screening types, 12 (2.3%) of the respondents had

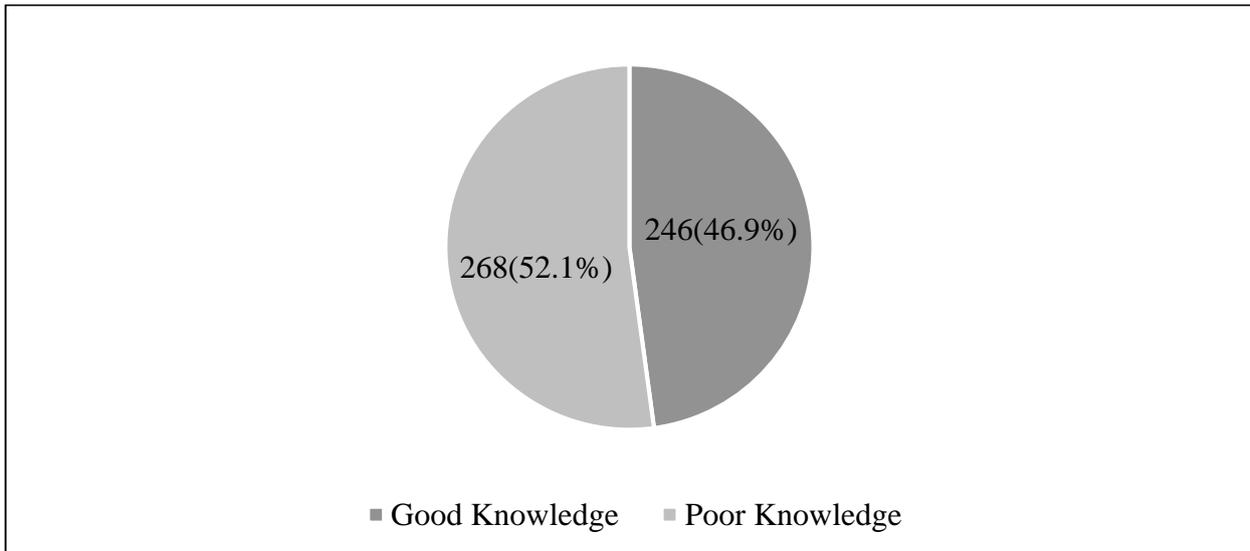


Figure 2: Overall respondents' knowledge on cervical cancer (n=514)

Table 2: Multivariate analysis showing association between respondents' socio-demographic characteristics and knowledge on cervical cancer screening

Variable	AOR	P-value	95% CI
Highest level of education			
No formal education (ref)	1.00	0.024*	1.5 – 3.6
Formal education	2.00		
Religion			
Christians (ref)	1.00	0.331	0.9 – 2.4
Non-Christians	0.84		
Occupational status			
Unemployed (ref)	1.00	0.035*	1.9 – 3.6
Employed	2.25		
Income			
No income (ref)	1.00	0.521	0.7 – 1.3
Income	0.73		
Location			
Rural (ref)	1.00	0.008*	1.2 – 3.5
Urban	2.00		
No of children			
<4 (ref)	1.00	0.286	0.9 – 1.2
4 and above	0.65		

*Statistically significant AOR: Adjusted odds ratio

utilized pap smear screening method, 4 (0.8%) utilized VIA screening method while 3 (0.6%) of the respondents had utilized DNA testing screening method. 421 (85.7%) were willing to attend a cervical screening exercise and 70 (14.3%) were not willing to attend any screening. Of those who were not willing to participate in screening, 16 (22.9%) were concerned about pain.

Bivariate analysis to determine association between respondents' willingness to screen for cervical cancer with educational level, religion,

Table 3: Multivariate analysis showing association between respondents' socio-demographic characteristics and willingness to attend cervical cancer screening

Variable	AOR	P-value	95% CI
Highest level of education			
Formal education (ref)	1.00	0.505	0.4 – 1.6
No formal education	0.78		
Religion			
Christians (ref)	1.00	0.031*	1.1 – 3.1
Non-Christians	1.81		
Occupational status			
Employed (ref)	1.00	0.481	0.7 – 2.3
Unemployed	1.24		
Location			
Rural (ref)	1.00	0.011*	1.2 – 3.4
Urban	2.00		
No of children			
<4 (ref)	1.00	0.004*	1.3 – 3.9
4 and above	2.25		

*Statistically significant AOR: Adjusted odds ratio

occupation, location, and number of children were found to be statistically significant (p<0.05). Table 3 shows the multivariate analysis using binary logistic regression to determine predictors for cervical cancer screening. Analysis showed that religion (aOR:1.81 (95% CI: 1.1 - 3.1)), location (aOR:2.00 (95% CI: 1.2 - 3.4)) and number of children (aOR:2.25 (95% CI: 1.3 - 3.9)) were found to be predictors that influence willingness to screen for cervical cancer. It therefore follows that non-Christians, persons living in urban areas and women with ≥ 4 children are more likely to go for screening.

Bivariate analysis to determine association between respondents' willingness to screen for

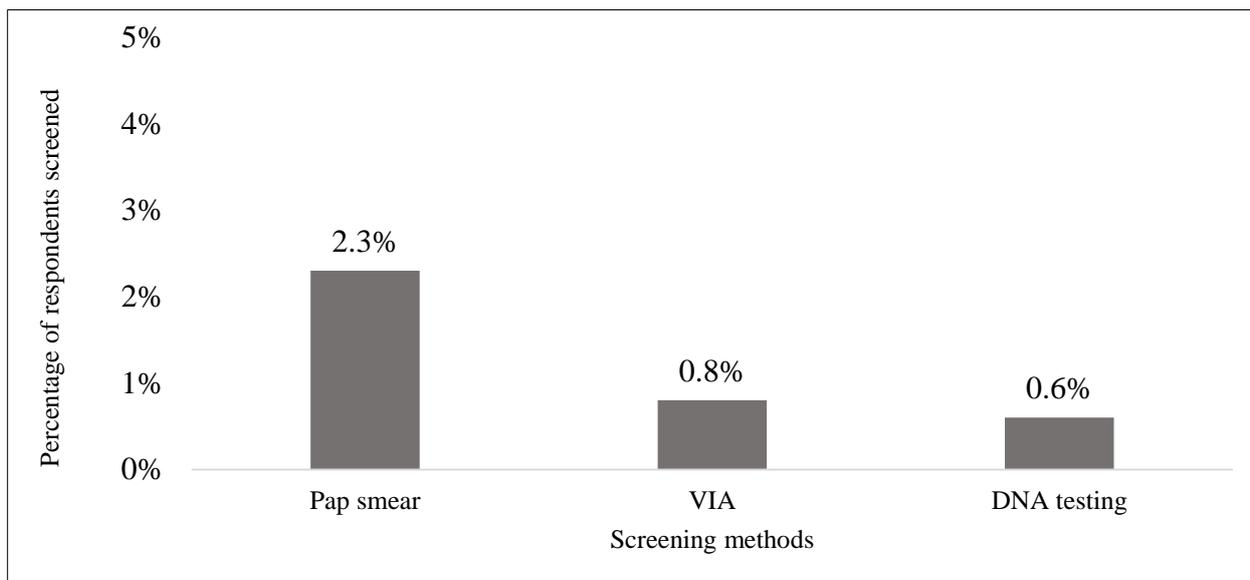


Figure 3: Utilization of cervical cancer screening services by respondents (n=514)

Table 4: Multivariate analysis showing association between respondents’ willingness to attend cervical cancer screening and environmental predictors to screening

Environmental Predictors	AOR	P-value	95% CI
Poor access routes to HF			
Yes	1.00	0.04*	0.234 – 0.973
No	0.48		
High cost of screening			
Yes	1.00	0.02*	0.207 – 0.879
No	0.42		
Not aware of location of screening centers			
Yes	1.00	0.03*	0.233 – 0.939
No	0.47		
Long clinic waiting hours			
Yes	1.00	0.03*	0.229 – 0.904
No	0.46		

*Statistically significant AOR: Adjusted odds ratio

cervical cancer with all environmental factors; long distance to health facility, poor access routes to health facility, high travel cost, high cost of screening, not aware of location of screening centers, inconvenient time schedule for screening, inconvenient place for screening, long clinic waiting hours were found to be statistically significant (p<0.05). Table 4 shows the multivariate analysis using binary logistic regression, it showed that poor

Table 5: Association between respondents’ willingness to attend cervical cancer screening and psychosocial predictors to screening

Psychosocial Barriers	AOR	P-value	95% CI
Fear of been diagnosed of cancer/its implications and stigma			
Yes	1.00	0.04*	0.112 – 0.899
No	0.34		
Unacceptable touch to my body			
Yes	1.00	0.02*	0.073 – 0.812
No	0.24		
Awareness program are deficient			
Yes	1.00	0.003*	0.145 – 0.674
No	0.31		
Not aware of appropriate age for screening			
Yes	1.00	0.00*	0.069 – 0.448
No	0.12		

*Statistically significant AOR: Adjusted odds ratio

access routes to health facilities (aOR:0.48 (95% CI: 0.234 – 0.973)), high cost of screening (aOR:0.42 (95% CI: 0.207 – 0.879)), not aware of screening centers (aOR:0.47 (95% CI: 0.233 – 0.939)) and long waiting hours (aOR:0.46 (95% CI: 0.229 – 0.904)) were found to be environmental predictors of cervical cancer screening. This suggests that with good access routes to health facilities, low cost of screening, increased awareness on location of screening centers and short clinic waiting hours

could lead to increase in uptake of cervical screening services.

Bivariate analysis to determine association between respondents' willingness to screen for cervical cancer with the following psychosocial barriers were significant; not comfortable with health worker attitude, fear of being tagged promiscuous, fear of been diagnosed of cancer/its implications and stigma, unacceptable touching to my body, embarrassing to tell people about, ashamed-shy to uncover my body, fell uneasy-distressed when come close to HCPs, previous bad experience with HCPs, busy and no time to do it, awareness program are deficient, not aware of appropriate age for screening, fear of exposure to STIs. Table 5 shows the multivariate analysis and fear of been diagnosed of cancer/its implications and stigma (aOR:0.34 (95% CI: 0.112 – 0.899)), unacceptable touch to my body (aOR:0.24 (95% CI: 0.073 – 0.812)), awareness programs are deficient (aOR:0.31 (95% CI: 0.145 – 0.674)), and not aware of appropriate age for screening (aOR:0.12 (95% CI: 0.069 – 0.448)), were found to be psychosocial predictors of cervical cancer screening. Thus, absence of stigma, improvement in awareness programs and communication of appropriate screening age could increase screening rate.

Discussion

The purpose of this study was to assess environmental and psychosocial barriers to cervical cancer screening among women in Gwagwalada Area Council, FCT – Abuja. All respondents selected were sexually active women aged 25 years and above residing in Gwagwalada Area Council of FCT in not less than 6 months. The mean age was 38.36 ± 11.6 years. A larger percentage of the respondents were between 25-40 years of age, this finding is also in line with the NDHS 2013 study that states that the age specific fertility rate pattern of women in the urban settings depicts a narrow pick at age 25-29 years¹⁷. In this study, majority were married and practicing monogamous family type which corresponds with the study carried out in Ondo state, Nigeria¹⁸. In this study, most of the respondents had secondary education as their highest level of qualification, similarly, majority of the respondents had husbands with secondary education as highest level of education, this finding is similar to the study conducted in Enugu,

Nigeria¹⁹. The religious groups represented were majorly Christians, this is because the FCT has different religious affiliations and the indigenes of the FCT are majorly the Gbagyi's with majority of them practicing Christianity. Most respondents were traders/farmers, had an income level of less than 10,000 and most of them have 2-3 children which correspond with the study carried out in Southwest Nigeria²⁰⁻²¹.

In this study it was observed that about half of the respondents were aware of cervical cancer, this is slightly higher than the 35.56% rate of awareness of cervical cancer reported among women in Onitsha¹⁷ and below 73.8% awareness reported in Ondo state¹⁸. Awareness rate for cervical cancer screening method was much lower with very few respondents having awareness on only pap smear. Majority reported not knowing any cervical screening method. Overall, slightly above half of the respondents had good knowledge on cervical cancer including screening method, signs/symptoms, and risk factors. A high level of awareness about cancer screening is important for success of prevention intervention²²⁻²³. Variations observed in this study in comparison with other previous study may be attributed to different classes of respondents used in the study. Studies using healthcare personnel (nurses, doctors, laboratory scientists) tend to report high levels of awareness. In this present study, respondents were drawn from the general population of women resident in Gwagwalada.

The level of awareness observed in this study indicates that there is need for more awareness programs to be done in this study site which can have greater effect on the study population. Health workers in any community are seen as role models that can help in influencing the attitudes of people towards their health so therefore there is need to engage health workers in awareness programs so that they can enlighten women on the diseases and the risk factors associated with it to change their wrong or negative perception about the disease.

From this study the majority of the respondents heard about cervical cancer from health workers and the media (TV, radio, internet) respectively. This is similar to most studies²⁴⁻²⁶ which reported health care workers as major source of information on cervical cancer and stresses the impact of health workers in the community. Also, sustaining the use of mass media in disseminating information to the general populace is imperative.

Thus, media houses should endeavor to promote health education through campaigns, dramas, debates and advertisements either free of charge or at subsidized rates. The over commercialization of the mass media should be revisited especially when it has to do with issues of reproductive health.

Similar to findings of other studies, this study reports low utilization of screening services among the "aware" group for cervical cancer screening as low as 2.3% of the entire population studied had ever screened for the disease. Although, this rate is higher than the 1.78%, reported²⁷ and 1.29% reported by²⁸ it is lower than the finding of 15.6% reported by²⁹ and similar to findings of 2.4% reported by³⁰. Variations in study outcomes is due to location and educational level of respondents in the various studies. The burden of cervical cancer cannot be appreciably reduced with these very low levels of uptake. Slightly below half of the respondents had no reason for not undergoing the test while others attributed old age, pain and not believing screening is effective as reasons for non-screening.

Respondents who had never had a screening test for cervical cancer admitted that if made available and affordable they would like to do the test. This is interesting and has rekindled hope that with robust public enlightenment campaign targeting women, coupled with availability and affordability of screening services, the level of uptakes will improve.

In this study, the major environmental barrier identified by respondents to uptake of screening services include poor access routes to health facilities, high cost of screening, not aware of screening centers and long waiting hours. This is similar to findings from³¹, were about 20% of the women interviewed had never gone for screening because they did not know where to get the services. Cancer screening services are mostly available in tertiary health institutions with catastrophic cost implications in most cases. Even though the present study site had a teaching hospital, uptake of services was still low. However, respondents admitted that if screening location was brought to the grass root and affordable they would like to do the test. Studies have shown that women who had attended at least primary school were more likely to attend screening in comparison with women who had never attended school³²⁻³³. Other studies have documented that women with low education are less knowledgeable

about the need for screening and have limited resources to cater for their screening attendance due to inherent cost³³. Even though majority of the respondents had at least primary education, this high level of literacy did not translate to high utilization of screening services in this study. This may be attributed to financial constraints and lack of awareness of screening sites.

The psychosocial barriers identified by respondents in this study that serve as barriers to utilization of services include fear of been diagnosed of cancer/stigma, unacceptable touch to the body, deficiency in awareness programs and not aware of appropriate age for screening. Thought of positive results after screening predicted low uptake of cancer screening among respondents in Ghana and Nigeria³²⁻³³. This could have also been responsible for the low cervical cancer screening observed among our respondents. In similar studies³⁴⁻³⁵ significantly encountered barriers perceived by those never screened were stigma following the diagnosis of cancer, being busy with lack of time for screening and fear of consequences. In another study, lack of awareness program was mentioned as a possible barrier more by women who ever screened compared to those never screened³⁶⁻³⁷. This study highlights the need to intensify enlightenment programs, subsidize screening services, and encourage community screening.

Limitations/Strength

This study presents to our knowledge, for the first-time predictors of environmental and psychosocial barriers to cervical cancer screening in Gwagwalada areas council in particular and generally in Abuja. The study was also quantitative thereby enabling researchers to get individual opinion on perceived barriers. However, the study was conducted in selected wards and communities in the area council therefore the findings may not be entirely representative of the entire area council.

Conclusion

Cervical cancer is preventable, however poor screening uptake by women remain a major challenge in the fight against cervical cancer thereby contributing significantly to the morbidity and mortality burden in Nigeria. This study showed low awareness level and poor knowledge of cervical

cancer which impacted uptake of screening services as only few women knew the screening methods and had ever been screened. High cost of screening services, poor access route, not aware of screening location and long clinic waiting time were environmental predictors identified from the study while fear of been diagnosed of cancer/stigma, not aware of appropriate screening age, unacceptable touch of the body and deficiency in awareness program were significant psychosocial predictors identified. In line with this, the National Cancer Control Program (NCCP) is recommended to intensify campaigns and enlightenment programs to encourage all women irrespective of their educational background to participate in cancer screening. Enlightenment program should provide information on appropriate screening age, frequency of screening, signs and symptoms of cancer, risk factors, screening methods, stigma and benefits of screening to improve the level of knowledge and uptake of screening. The Federal Ministry of Health (FMOH) should establish clear guidelines on screening for cervical cancer, at health institutions such as making it one of the routines for women of childbearing age and as such providing the necessary equipment for the procedure to all the different units and also training workers on the skills. Strategies such as free or subsidized screening and/or treatment services should be utilized to encourage women and increase screening uptake and reduce high incidence and death.

Acknowledgements

We thank the lecturers of the Department of Community Health, College of Medical Sciences, Ladoke Akintola University of Technology (LAUTECH) for supporting the review of the research work and Jommurota Community Care Initiative for providing data collectors.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

Abah Angela Ukpojo conceived, designed and implemented the research; analyzed the results and wrote the first draft of the manuscript. Aderonke Omokhapue supported the review of the first draft.

Nnamdi Usifoh and Adefisoye Adewole supported the statistical analyses and Prof Olugbenga-Bello Adenike Iyanuoluwa supervised the entire research work. All the authors gave valuable input in the subsequent draft and approved the final version of the manuscript. All authors read and approved the final version of this manuscript and equally contributed to its content.

Funding

This research was self-funded by the researchers.

References

1. World Health Organization. Latest Global Cancer Data. 2018. https://www.iarc.fr/wp-content/uploads/2018/09/pr263_E.pdf. Accessed 14 August 2018.
2. Bray F, Ferlay J, Soerjomataram I, Siegel E, Torre LA and Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2018;68(6):394–424.
3. World Health Organization. The Global Cancer Observatory-Nigeria. 2019. <https://gco.iarc.fr/today/data/factsheets/populations/566-nigeria-fact-sheets.pdf>. Accessed 14 August 2019.
4. Siegel R, Ma J and Zou Z. Cancer Statistics. *CA Cancer J Clin.* 2014;64(1):9–29.
5. Adebamowo CA. Cancer in Nigeria. 2007. *American Society of Clinical Oncology (ASCO) News and Forum:* 171–191.
6. American Cancer Society. Cancer facts and figures. 2009. <https://www.cancer.org/research/cancer-facts-statistics/all-cancer-facts-figures/cancer-facts-figures-2009.html>.
7. WHO. WHO: Prevention of Cervical Cancer Through Screening Using Visual Inspection With Acetic Acid (VIA) and Treatment With Cryotherapy: A Demonstration Project in six African Countries: (Malawi, Madagascar, Nigeria, Uganda, the United Republic of Tanzania, and Zambia). 2012.
8. Federal Ministry of Health. Nigeria National Cancer Control Plan (2018 - 2022). 2018. https://www.iccp-portal.org/system/files/plans/NCCP_Final%20%5B1%20%5D.pdf. Accessed 14 August 2019.
9. Ferlay J and Ervik M. *Cancer Incidence and Mortality Worldwide.* 2012.
10. WHO. WHO/ICO Information Centre on HPV and Cervical Cancer (HPV Information Centre): Human Papilloma virus and Related Cancers in Nigeria. Summary Report 2010. 2010.
11. Gielen A and McDonald EM. Using the PRECEDE-PROCEED Planning model to apply health behavior theories. In: Glanz K, Rimer BK, Lewis FM, editors. *Health Behavior and Health Education: Theory, Research, and Practice.* 3. San Francisco, CA: Jossey-Bass; 2002.

12. Green L and Krueger MW. Health Promotion Planning: An Educational and Environmental Approach. Mountain View, CA: Mayfield; 1991.
13. National Bureau of Statistics. Demographic Statistics Bulletin. 2018. <https://nigerianstat.gov.ng/download/775>.
14. Okunowo AA, Daramola ES, Soibi-Harry AP, Ezenwankwo FC, Kuku JO, Okunade KS and Anorlu RI. Women's knowledge of cervical cancer and uptake of Pap smear testing and the factors influencing it in a Nigerian tertiary hospital. *J Cancer Res Pract.* 2018;5(3):105–111.
15. Kothari CR. *Research Methodology Methods and Techniques*. Second revised edition. 2004. New Age International Publishers and New Delhi.
16. Borg WRS and Gall MD. *Education Research. An Introduction*. 4th Edition. 2007. New York: Longman Publishers.
17. Dodo A, Sykes P and Powell C. Exploring the Barriers to Breast and Cervical Cancer Screening in Nigeria: A Narrative Review. *Afr J Reprod Health.* 2016;20(4):89–98.
18. Titiloye MA, Womitenren YT and Arulogun OS. Barriers to Utilization of Cervical Cancer Screening Services Among Women of Reproductive Age in Ondo, Southwest Nigeria. *Afr J Biomed Res.* 2017;20:229–235.
19. Nwozor CM and Oragudosi AL. Awareness and Uptake of Cervical Cancer Screening among Women in Onitsha, South-East, Nigeria. *Greener J Med Sci.* 2013;3(8):283–288.
20. Onyenwenyi AOC and Mchunu GG. Barriers to cervical cancer screening uptake among rural women in South West Nigeria: A qualitative study. *South Afr J Obstet Gynaecol.*
21. Sitas F, Parkin DM, Chirenje M, Stein L, Abratt R and Wabinga H. Cancer in Indigenous Africans—causes and control. *Lancet Oncol.* 2008;9(8):8–14.
22. Mfuh AY and Lukong CS. Women's Views on Knowledge and Barriers to Cervical Cancer Screening among Women in Kaduna State, Nigeria. *Greener J Epidemiol Public Health.* 2016;4(2):044–054.
23. Aniebue PN and Aniebue UU. Awareness and Practice of Cervical Cancer Screening Among Female Undergraduate Students in a Nigerian University. *J Cancer Educ.* 2010;25:106–108.
24. Royal Thai College of Obstetricians and Gynaecologists (RTCOC)/JHPIEGO. Cervical Cancer Prevention Group: Safety, acceptability, and feasibility of a single-visit approach to cervical cancer prevention in rural Thailand: a demonstration project. *Lancet.* 2003;361:814–820.
25. Olusegun K and Adepiti CA. Knowledge of Cervical Cancer and Utilization of Pap Smear among Patients in a Tertiary Centre in South West Nigeria. *Ibom Med J Ibommedicaljournalcom.* 2012;3(2):56–60.
26. Ahmed SA, Sabitu K, Idris SH and Ahmed R. Knowledge, attitude and practice of cervical cancer screening among market women in Zaria, Nigeria. *Niger Med J.* 2013;(54):316–319.
27. Balogun MR, Odukoya OO, Oyediran MA and Ujomu PI. Cervical cancer awareness and preventive practices: a challenge for urban slum dwellers in Lagos, Nigeria. *Afr J Reprod Health.* 2012;16(1):75–82.
28. Ali-Risasi C, Mulumba P, Verdonck K, Broeck DV and Praet M. Knowledge, attitude and practice about cancer of the uterine cervix among women living in Kinshasa, the Democratic Republic of Congo. *BMC Womens Health.* 2014;14(1).
29. Jeronimo J, Bansil P and Lim J. A multicountry evaluation of care HPV testing, visual inspection with acetic acid, and papanicolaou testing for the detection of cervical cancer. *Int J Gynecol Cancer.* 2014;24(3):576–585.
30. Sherris J, Wittet S, Kleine A, Sellors J, Luciani S, Sankaranarayanan R and Barone MA. Evidence-based, alternative cervical cancer screening approaches in low-resource settings. *Nt Perspect Sex Reprod Health.* 2009;I 35:147–154.
31. Buchanan Lunsford N, Ragan K, Lee Smith J, Saraiya M and Aketch M. Environmental and Psychosocial Barriers to and Benefits of Cervical Cancer Screening in Kenya. *The Oncologist.* 2017;22(2):173–181.
32. Williams M, Kuffour G, Ekuadzi E, Yeboah M, EIDuah M and Tuffour P. Assessment of psychological barriers to cervical cancer screening among women in Kumasi, Ghana using a mixed methods approach. *Afr Health Sci.* 2013;13(4).
33. Idowu A, Olowookere SA, Fagbemi AT and Ogunlaja OA. Determinants of Cervical Cancer Screening Uptake among Women in Ilorin, North Central Nigeria: A Community-Based Study. *J Cancer Epidemiol.* 2016;2016:1–8.
34. Isa Modibbo F, Dareng E, Bamisaye P, Jedy-Agba E, Adewole A, Oyeneyin L, Olaniyan O and Adebamowo C. Qualitative study of barriers to cervical cancer screening among Nigerian women. *BMJ Open.* 2016;6(1):e008533.
35. Cunningham MS, Skrastins E, Fitzpatrick R, Jindal P, Onoko O, Yeates K, Booth CM, Carpenter J and Aronson KJ. Cervical cancer screening and HPV vaccine acceptability among rural and urban women in Kilimanjaro Region, Tanzania. *BMJ Open.* 2015;5(3):e005828–e005828.
36. Islam A and Tahir MZ. Health sector reform in South Asia: new challenges and constraints. *Health Policy.* 2002;(60):151–169.
37. Daniel CN, Emmanuel IN, Lydia RA, Magaji A and Siddique MS. Screening for cervical cancer: Experience from a university hospital in northwestern Nigeria (2007-2009). *J Basic Clin Reprod Sci.* 2013;2(1):18.