

Sexual Behavioral Pattern, Cervical Cancer Awareness and Screening Practices among Female Undergraduate Students of Public Universities in Anambra State, Nigeria

Valentine C Ilika¹, Chinomnso C Nnebue^{2,*}, Ngozi N Ikechebelu³, Chito P Anyanwu⁴,
Amobi L Ilika⁵, Joseph I Ikechebelu⁶

¹Department of Community Medicine, Chukwuemeka Odumegwu Ojukwu University Awka, Nigeria

²Department of HIV Care and Department of Community Medicine, Nnamdi Azikiwe University Teaching Hospital Nnewi, Nigeria

³Department of Community Medicine, Chukwuemeka Odumegwu Ojukwu University / University Teaching Hospital Awka, Nigeria

⁴Department of Obstetrics and Gynecology, Nnamdi Azikiwe University Teaching Hospital Nnewi, Nigeria

⁵Department of Community Medicine, Nnamdi Azikiwe University/University Teaching Hospital Nnewi, Nigeria

⁶Department of Obstetrics and Gynecology, Nnamdi Azikiwe University/University Teaching Hospital Nnewi, Nigeria

*Corresponding author: nnebnon@yahoo.com

Abstract Background: Risky sexual behavior, low level of awareness and poor screening uptake have been linked to the high prevalence of cervical cancer in our environment. **Objective:** To determine the sexual behavioral pattern, cervical cancer awareness and screening practices among female undergraduate students of public universities in Anambra state, Nigeria. **Materials and methods:** This was a descriptive cross sectional study of 342 female undergraduate students in Anambra state, Nigeria selected using a two stage sampling. Data was collected using a pre-tested semi-structured questionnaire and analysed using statistical package for social sciences version 22.0. Chi-square test was used to identify statistically significant associations between variables. A p value of ≤ 0.05 was considered significant. **Results:** The modal age at menarche, 215 (62.9%) was 13-15 years, while 18 (5.3%) first menstruated at ages below 10 years. Of the 311 (71.6%) that ever had sex, 289 (92.9%) had their coitarche at ages below 24 years, 209 (67.2%) were sexually active while 48 (15.4%) had multiple sex partners. About 310 (90.6%) have heard of cervical cancer, 269 (78.8%) were aware of cervical cancer screening, out of which 108 (40.2%) were aware of cervical cancer screening tests with Pap smear as the most mentioned screening test by 55 (51.0%). There were statistically significant associations between uptake of cervical cancer screening and [ever been pregnant ($p=0.005$), ever used contraceptives ($p=0.001$) and perceived need for cervical cancer screening ($p=0.000$)] respectively. **Conclusions:** This study showed a good level of awareness of cervical cancer but cervical cancer screening practices was inadequate. We recommend educational programs and comprehensive cervical cancer screening strategy.

Keywords: cervical cancer, awareness, screening practices, sexual behavior, female undergraduates, Anambra state Nigeria

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1. Introduction

Cancer of the cervix is the commonest genital tract malignancy in the female. [1] It accounts for nine percent of all female cancers. [2] In 2010, the global incidence of cervical cancer was 454,000 cases, of which about 50% resulted in death. [3] In Nigeria the national incidence by age standardized rate (ASR) per 100,000 across 10 age groups is 29.0, [4] (36.0 per 100,000 ASR at the Ibadan cancer registry and 30.3 per 100,000 at the Abuja cancer registry). [5] The mortality by ASR per 100,000 across 10

age groups is 17.5, the cumulative risk (number of newborn girls) expected to develop cervical cancer/out of 100 is 3.28, while the mortality – cumulative risk (number of newborn girls) expected to die of cervical cancer/out of 100) is 2.05. [4] In contrast, the cervical cancer incidence by ASR in the United States of America (USA) is 2.7/100,000 and in Japan it is 2.8/100,000. [2]

The etiology of cervical cancer is multifactorial. These factors include: risky sexual behaviors such as having multiple sexual partners or male partner with other female partners and early coitarche (sexual debut); high parity; cigarette smoking; use of barrier and oral contraceptives, use of immunosuppressant, certain dietary deficiencies

and poor personal hygiene. [6,7] Also reported are infection with human papilloma virus (HPV), co-infection with human immunodeficiency virus (HIV). Chlamydia trachomatis and herpes simplex virus type-2. [8,9] However, key factors linked to the disparity in incidence of cervical cancer between these populations in the developing and developed world include: lack of awareness and lack of access to effective cytological screening programs in developing countries. [10,11] Another reason in this double burden of disease is the focus on competing health priorities such as HIV/AIDS, tuberculosis and malaria. [12,13] No doubt more than 85% of global cervical cancer deaths occurs in less developed countries. [2,14]

Benefits of cervical cancer screening programs are well documented. [15,16] It is believed that widespread screening of women for precursor lesion and early detection of the invasive disease can greatly increase the chance of successful treatment. This results in approximately 40% reduction in incidence and mortality associated with invasive cancer. [17] Papanicolaou (Pap) test or cervical cytology screening is a reliable, inexpensive and the most widely recognized early detection test for cervical cancer [15,18]. Alternative screening approaches especially in resource-poor settings include: visual inspection with acetic acid (VIA), visual inspection with Lugol's iodine (VILI), cervicography and speculscopy.

The World Health Organization, recommends the commencement of cervical cancer screening with the age of 25 years. [19] This is the practice in Colombia, Jamaica, Singapore and Venezuela. [20] Other countries such as the Barbados [20] and South Africa [21] recommend to begin cervical cancer screening at the age of 21 years. In the USA, the United States Preventive Services Task Force [22] and the American Cancer Society [23] recommend that all women should begin cervical cancer screening at age 21 years, with repeat tests after every 3 years till the age of 30 years and thereafter, every 5 years with combined Human Papillomavirus test till the age of 65 years. In Nigeria, there is no organized government screening policy, screening being offered at the request of patients or the suggestion of health personnel.

Active participation of the target population is required for the success of the screening programs. [15] A study among female university students across 25 low and middle and emerging economy countries, found an overall low participation rate (0-7.1%) in cervical cancer screening. [24] Several other studies among female university students in developing countries corroborated this finding, e.g., (0-8.3%) in Nigeria, [25,26,27,28] 12% in Ghana [29] and 6% in Bhutan. [30] While studies among female university students in high income countries found a higher participation rate in screening for cervical cancer, e.g. 44.8% in Greece [31] and 41% in USA. [32]

Researchers have reported possible reasons for a low participation in cervical cancer screening among female university students. These include: lack of awareness of the existence of such a test, its importance, centers where such services are obtainable and risk factors to the development of cervical cancer. [25,26,28,29,33] Efforts need to be intensified to increase awareness of this condition among this population. The aim of this study

was to determine the sexual behavioral pattern, cervical cancer awareness and screening practices among female undergraduate students of public universities in Anambra state, Nigeria.

2. Methodology

2.1. Description of Study Area

Anambra State is one of the five states in the South Eastern part of Nigeria. It has located in it one Federal (Nnamdi Azikiwe University), one State (Chukwuemeka Odumegwu Ojukwu University) and three Missionary Universities. Nnamdi Azikiwe University has three campuses, with its main campus at Awka and the other two at Nnewi and Agulu. The Chukwuemeka Odumegwu Ojukwu University also has three campuses, with its main campus at Uli and the other two at Igbariam and Awka.

2.2. Study Design

The study design was a cross-sectional descriptive study.

2.3. Study Population

The study population comprises of female undergraduate students of the public Universities in Anambra State.

2.3.1. Inclusion Criteria

Female undergraduate students of the public Universities in Anambra State who consent to this study.

2.3.2. Exclusion Criteria

Female undergraduate students living in private hostels were excluded from the study as they would be difficult to track. This group may not be influenced by the way of life within the campus. Also, those who have had hysterectomies as well as students who were absent from school during the study period were excluded.

2.4. Sample Size Determination

The sample size was determined using the Leslie Kish's formula for single proportions which stated: [34]

$$n = Z^2 pq / d^2$$

where,

Z = standard normal deviate set at 1.96 which corresponds to 95% confidence interval.

p = percentage awareness of cervical screening in an Ibadan study by Ayinde *et al.*, = 33.5% = 0.335. [27]

q = complementary prevalence (1-p) = 1- 0.335 = 0.665

d = level of precision usually set at 0.05

$$n = (1.96)^2 \times 0.335 \times 0.665 / 0.05^2 \\ = 342.33 = 343 \text{ students.}$$

Anticipating a response rate of 90%, an adjustment of the sample size estimate to cover for non- response rate was made by dividing the sample size estimate with a factor f, i.e. n/f, where f is the estimated response rate. [34] Thus the calculated sample size = 343/0.90 = 381 students. However out of the 384 questionnaires that were distributed, 342 were completely filled and returned.

2.5. Sampling Technique

Our study participants were selected in two stages. The first stage involved the use of stratified sampling technique to get the proportion of 64 students each from the six campuses that would make up the total population of 384. The second stage involved simple random sampling technique using a table of random numbers with the hostel register as the sampling frame, to select the students that were studied until the required sample size was obtained.

2.6. Data Collection Technique

Data collection in this study was done using pre-tested, semi- structured questionnaires developed from review of relevant literatures. All questions were written in English language and pre-tested on similar set of respondents in Madonna University Okija, Anambra state. This was done, to check for the reliability, validity, appropriateness of format, wording and time needed to fill the questionnaire. Thereafter the instruments were reviewed by colleagues, necessary adjustments and corrections were effected before administering the questionnaire to the study participants.

The questionnaire is divided into three sections (A-C) to obtain data on A) the socio- demographic characteristics of the respondents; B) sexual and reproductive history of respondents and C) awareness of cervical cancer, its risks, screening tests and barriers to the screening tests.

To ensure data quality, training of data collection team and field monitoring of data collection were done. Timely availability of the study instruments, meeting of data collection team at the end of every day to share experiences and submit completed forms, and solving field problems were ensured.

2.7. Data Management and Analysis

The data were edited and entered into the computer. Data cleaning was done by carrying out range and consistency checks. Descriptive and analytical statistics of the data were carried out using statistical package for social sciences (SPSS) Windows version 22.0. [35] Tests of statistical significance were carried out using Chi square tests for proportions. A p value of < 0.05 was considered significant. Descriptive data were presented as simple frequencies and percentages.

2.8. Ethical Consideration

Approval was obtained from the appropriate authorities in the studied institutions. Verbal consent of the respondents was also solicited and obtained for the conduct and publication of this research study. Study participants were free to refuse or withdraw from the study at any time without any penalty. All authors hereby declare that the study has been examined and approved by the Department of Community Medicine Chukwuemeka Odumegwu Ojukwu University and University Teaching Hospital ethics committee, Nigeria and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

3. Results

Table 1 shows the socio- demographic characteristics of respondents. A total of 342 respondents participated in the study. The modal age group was 20-29 years, 300 (87.7%). Majority 287 (83.9%) were never married, 333 (97.4%) were Christians while 270 (78.9%) dwell in the urban areas.

Table 1. Distribution of respondents' socio-demographic characteristics

Characteristics	Frequency N=342	Percentage (%)
Age group (years)		
≤19	27	7.9
20 -29	300	87.7
30 -39	10	2.9
≥40	5	1.5
Total	342	100.0
Marital status		
Never married	287	83.9
Married	51	14.9
Divorced/separated	4	1.2
Total	342	100.0
Tribe		
Ibo	335	97.9
Hausa	1	0.3
Yoruba	6	1.8
Total	342	100.0
Religion		
Christian	333	97.4
Moslem	9	2.6
Total	342	100.0
Year of study		
First	63	18.4
Second	98	27.2
Third	79	23.1
Fourth	64	18.7
Fifth	20	5.8
Sixth	23	6.7
Total	342	100.0
Place of Residence		
Urban	270	78.9
Rural	72	21.1
Total	342	100.0

Table 2 highlights the distribution of sexual and reproductive history of respondents. The modal age at menarche, 215 (62.9%) was 13-15 years, while 18 (5.3%) of respondents first menstruated at ages below 10 years. Of the 311 (71.6%) that ever had sex, 289 (92.9%) had their sexual debut at the ages below 24 years, 209 (67.2%) were sexually active (had sex within three months prior to the study, while 48 (15.4%) had multiple sex partners. Thirty nine (12.5%) of them had been pregnant before, while 169 (54.3%) had ever used contraceptives with condoms as the contraceptive with the highest self-reported use by 167 (53.7%) of respondents. Twenty three (6.7%) of respondents had ever used tobacco.

Table 2. Distribution of respondents' sexual and reproductive history

Characteristics	Frequency N=342	Percentage (%)
Age at menarche (years)		
< 10	18	5.3
10-12	76	22.2
13-15	215	62.9
>15	33	9.6
Ever had sex		
Yes	311	71.6
No	31	28.4
Age at sexual debut (coitarche), n=311		
10-14	15	4.8
15-19	129	41.5
20-24	145	46.6
25-29	18	5.8
≥30	4	1.3
Sexually active (had sex within three Months prior to the study, n=311)		
Yes	209	67.2
No	102	32.8
Number of sexual partners three Months prior to the study, n=311		
0	102	32.8
1	161	51.8
≥ 2	48	15.4
Ever used contraceptives, n=311		
Yes	169	54.3
No	142	45.7
Type of contraceptives used*		
Condoms	167	53.7
Pills	17	5.5
Injectable	5	1.6
Implants	1	0.3
Intra uterine contraceptive device	1	0.3
Ever been pregnant, n=311		
Yes	39	12.5
No	272	87.5
Number of children, n=39		
0	15	38.5
1	10	25.6
2	8	20.5
≥3	6	15.8
Ever used tobacco		
Yes	23	6.7
No	319	93.3

* Multiple responses applicable

Table 3 summarizes the awareness of cervical cancer, its risks, screening tests and barriers to the screening tests. Most of all the respondents, 310 (90.6%) have heard of cervical cancer with 198 (63.9%) of them reporting their source as Physician/health workers. human papilloma virus was the most self-reported risk factor of cervical cancer, by 103 (33.3%) of them. Two hundred and sixty nine (78.8%) were aware of cervical cancer screening, out of which 108 (40.2%) were aware of cervical cancer screening tests with PAP smear as the most mentioned screening test by 55 (51.0%). Self-reported barriers to cervical cancer screening include: 115 (42.8%) lack of awareness, 35 (13.0%) fear of positive result, 23 (8.6%) did not know where to do the screening, 20 (7.4%) fear of vaginal examination.

Table 3. Awareness of cervical cancer, its risks, screening tests and barriers to the screening tests

Characteristics	Frequency	Percentage
Heard of cervical cancer? n=342.		
Yes	310	90.6
No	32	9.4
Total	342	100.0
Source of information for cervical cancer* (For those that demonstrated awareness) n=310		
Physician/health workers	198	63.9
Seminar/workshop	32	10.3
Radio /TV	30	9.7
Journals	21	6.8
Newspaper	21	6.8
Friends	15	4.8
Religious forum	3	1.0
Self-reported risk factors of cervical cancer*, n=310		
Human Papilloma Virus infection	103	33.2
Long term hormonal contraceptive use	7	2.3
Family history of cervical cancer	6	2.0
Chlamydia infection	4	1.3
Human Immuno-deficiency Virus infection	1	0.3
Herpes simplex virus type 2 infection	1	0.3
Heard of cervical cancer screening? n=342.		
Yes	269	78.8
No	73	21.2
Total	342	100.0
Heard of cervical cancer screening tests? n=269.		
Yes	108	40.2
No	161	59.8
Cervical cancer screening tests mentioned by respondents, n=108		
Pap smear	55	51.0
High vaginal swab	19	18.5
Vaginal examination	14	13.0
Endocervical swab	7	6.5
Visual inspection with acetic acid	4	3.7
No response	9	8.3
Self-reported barriers to cervical cancer screening, n=269		
Lack of awareness	115	42.8
Fear of positive result	35	13.0
Did not know where to do the screening	23	8.6
Fear of vaginal examination	20	7.4
Fear of false positive screening results	15	5.6
Assumed Pap smear to be harmful	11	4.1
Lack of finances	10	3.7
Had no reason	40	14.9

* Multiple response applicable.

Table 4 shows the association of socio-demographic and subject variables with uptake of cervical cancer screening. There were statistically significant associations between uptake of cervical cancer screening and [ever been pregnant ($\chi^2=7.905$, $p=0.005$), ever used contraceptives ($\chi^2=11.047$, $p=0.001$) and self-reported need for cervical cancer screening ($\chi^2=166.105$, $p=0.000$) respectively.

Table 4. Association of socio-demographic and subject variables with uptake of cervical cancer screening

Variables	Uptake of cervical cancer screening Frequency N=342 Percentage (%)			Chi square	p value
Age group (years)					
≥19	4 (1.2)	23 (6.7)	27 (7.9)	0.020, df=3	0.887
20 -29	55 (16.1)	245 (71.6)	300 (87.7)		
30 -39	3 (0.9)	7 (2.0)	10 (2.9)		
≥ 40	1 (0.3)	4 (1.2)	5 (1.5)		
Total	63 (18.4)	279 (81.6)	342 (100.0)		
Marital status					
Single	51 (14.9)	236 (69.0)	287 (83.9)	0.270, df=1	0.603
Married	11 (3.2)	40 (11.7)	51 (14.9)		
Divorced/separated	1 (0.3)	3 (0.9)	4 (1.2)		
Total	63 (18.4)	279 (81.6)	342 (100.0)		
Place of Residence					
Urban	50 (14.6)	220 (64.3)	270 (78.9)	0.007, df=1	0.935
Rural	13 (3.8)	59 (17.3)	72 (21.1)		
Total	63 (18.4)	279 (81.6)	342 (100.0)		
Age at menarche (years)					
< 10	7 (2.1)	11 (3.1)	18 (5.3)	0.602, df=1	0.438
10-12	12 (3.5)	64 (18.7)	76 (22.2)		
13-15	38 (11.1)	177 (51.8)	215 (62.9)		
>15	6 (1.8)	27 (7.8)	33 (9.6)		
Total	63 (18.4)	279 (81.6)	342 (100.0)		
Number of sexual partners three months prior to the study, n=311					
0	21 (6.8)	81 (26.0)	102 (32.8)	0.870, df=2	0.351
1	30 (9.7)	131 (38.3)	161 (51.8)		
≥2	12 (3.9)	36 (11.5)	48 (15.4)		
Ever been pregnant, n=311					
Yes	15 (4.8)	24 (7.7)	39 (12.5)	7.905, df=1	0.005*
No	48 (15.4)	224 (72.1)	272 (87.5)		
Ever used contraceptives, n=311					
Yes	22 (7.0)	147 (47.3)	169 (54.3)	11.047, df=1	0.001*
No	41(13.2)	101 (32.5)	142 (45.7)		
Ever used tobacco					
Yes	7 (2.0)	16 (4.7)	23 (6.7)	1.588, df=1	0.208
No	56 (16.4)	263 (76.9)	319 (93.3)		
Total	63 (18.4)	279 (81.6)	342 (100.0)		
Self- reported need for cervical cancer screening, n=311					
Yes	57 (18.3)	24 (7.7)	81 (26.0)	166.105, df=1	0.000*
No	6 (1.9)	224 (72.1)	230 (74.0)		

* Statistically significant association - $p \leq 0.05$.

4. Discussion

The results of our study showed sexual and reproductive history depicting of high prevalence of the major risk factors for cervical cancer among the respondents. This included early coitarche, multiple sexual partners, ever used contraceptives. This finding agrees with the results of another study. [25]

Awareness of a disease or health related condition often results in improved specific health indices. For instance, the incidence of cervical cancer in developed countries has decreased due to high awareness, increased uptake of screening, early detection and treatment of the disease. However, in developing countries, 80% of the cervical cancers are at their advanced stage when they are incurable at the time of detection due to lack of awareness. [36] In the current research, we assessed the awareness of cervical cancer, its risks, screening tests and barriers to the screening tests. The level of awareness of 90.6% found in

the index study is higher than figures reported in other studies. [33,37,38] The differences in the levels of awareness may be partly explained by educational status as highest levels of awareness have been documented in studies where participants were undergraduates and health care professionals. [[36]]

Physician/health workers (63.9%) was the major source of information in this study. This is similar to the result of another study. [10] It is however, different from other studies where the mass media (radio and television) was the main source of information. [15,39,40]

Our study findings showed that (78.8%) were aware of cervical cancer screening. Again, this finding is higher than (26.85%) reported elsewhere. [41] Also, our study found that (40.2%) were aware of cervical cancer screening tests with Pap smear as the most mentioned screening test. This is in concordance with about (33.3-47.4%) reported by some studies. [15,25,38,41] It is however higher than 12.6% and 23.1% reported elsewhere. [10,30]

In addition, our study results showed that cervical cancer screening uptake rate was 18.4%. Pap smear test utilization rate of 10.2% has been documented, with routine ANC as the major reason for getting screened. [15] This level of uptake of screening is clearly unsatisfactory and self-reported barriers to cervical cancer screening from our study include: lack of awareness, fear of positive result, did not know where to do the screening and fear of vaginal examination. These have been cited as the major reasons for not accessing the test by respondents in other studies. [10,25,30,38] This reveals poor appreciation of the disease, and the failure of the health system to effectively disseminate information. Fear and anxiety associated with a positive result stems from the poor understanding of the basis for cervical screening. Opportunistic screening, mass media campaigns and antenatal care (ANC) education have thus been suggested as ways of improving awareness and utilization of cervical cancer screening services. [15]

The present study, examined the relationship between participants' socio-demographic and subject variables with uptake of cervical cancer screening. There were statistically significant associations between uptake of cervical cancer screening and [ever been pregnant, ever used contraceptives and perceived need for cervical cancer screening respectively. Previous studies have found that women who rated cervical cancer screening as more important had uptake more often. [25,26,29] This finding may have implications for cervical cancer awareness and screening programs.

Limitation of the study: This study is based on self-reports and is subject to social desirability bias due to the sensitive nature of some of the questions.

5. Conclusions

This study demonstrated a sexual and reproductive history indicating high prevalence of the major risk factors for cervical cancer among the respondents. There was good level of awareness of cervical cancer among the female undergraduates but cervical cancer screening practices was inadequate. However, the reasons advanced for poor utilization are modifiable. Efforts at developing educational programs and comprehensive cervical cancer screening strategy can reduce indulgence in risky sexual behavior, increase the importance related to cervical cancer as well as translate the high level of awareness recorded into good uptake of cervical cancer screening. Implementation of other methodologies for cervical cancer screening such as liquid-based cytology and HPV DNA and visual inspection with acetic acid (VIA) testing could result in improved cervical cancer prevention and more accurate identification of early-stage disease.

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None.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

Author VCI, NNI and CPI were involved in the design and implementation of the study. CCN was involved in the analysis of data, interpretation of results, write up of this study and editing of the main paper, ALI and JII were involved in the design and editing of the main paper. All authors read and approved the final manuscript.

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