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CERVICAL CANCER KNOWLEDGE, AWARENESS, SCREENING AND VACCINATION AMONG FEMALE UNDERGRADUATE HEATH PROFESSIONAL STUDENTS OF NIGER DELTA UNIVERSITY IN SOUTH – SOUTH NIGERIA

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ABSTRACT

Cervical cancer (CC) is a preventable cancer of the female genital tract responsible for huge morbidity and mortality globally especially among women in areas where organized screening is not available. This study aimed at evaluating the knowledge of CC, its screening and prevention among undergraduate health professionals in a tertiary institution in south-south Nigeria. A descriptive cross-sectional study was carried out. Data was retrieved with the use of self-designed and pre-tested questionnaires. A total of 250 students were surveyed comprising of pharmacy, nursing, medical lab and medical students. Data was analyzed with SPSS version 20. Most respondents were single (80.5%) within age range 15-30 years (96.3%); over 60% ever had sexual intercourse that debuted at 15-20 years of age. Nearly half (49.3%) had multiple sexual partners. CC prevalence was 3.3%; majority of respondents (85.6%) had a good knowledge of CC; sources of information included television (40.5%), seminars (12.1%) and school lectures (7.9%). 64.6%, 59.5%, and 59.1% positively identified Pelvic Examination, The Pap Smear and HPV testing respectively as CC screening methods but only 16.3% of respondents had ever been screened. Knowledge of CC vaccine was low; only 26% ever heard of CC vaccine and only 4.2% had been vaccinated. There is need to beef up undergraduate curricula and to improve on current levels of CC awareness and knowledge among this population.

KEYWORDS: Cervical Cancer, Knowledge, Screening, Vaccine, Undergraduate Students, Prevalence.

INTRODUCTION

Cervical cancer (CC) is a major public health problem. CC can be prevented, yet, it remains one of the leading causes of cancer deaths in women globally. Majority of these deaths occur in developing countries.[1]

Women in Sub-Saharan Africa are worst hit with CC; here, it is the most common cancer responsible for 13% of all female cancers.[2]

In Nigeria, it is the second most common female cancer after breast cancer.[3] It is the most common female genital cancer responsible for most mortality cases among Nigerian females during their most productive years.

It has become incontrovertible that CC screening lowers the risk of CC and its resultant mortality. A risk-modifying effect of almost 80% reduction has been demonstrated through regular screening.[4]

CC screening uptake is also modulated by the knowledge base of women; the lower the knowledge of women about CC and ways of preventing it, the less likely these women will embrace the screening services.[5]

In 2007, it was reported that 36.59 million women aged ≥15 years in Nigeria were at risk of developing cervical cancer. There are 9922 cases diagnosed annually with 8030 deaths.

In many developed countries, where national routine screening programs using the Papanicolaou (Pap) smear have been implemented, the CC incidence and mortality have been significantly reduced.[6]

Early detection and treatment of cervical precancerous lesions is associated with high cure rates, whereas failure to detect precancerous lesion increases the risk to CC development and hence the risk of premature death.

This study was therefore carried out to investigate the current knowledge of cervical cancer, cervical screening and prevention among undergraduate students in the Faculty of Pharmacy and College of Health Sciences, Niger Delta University, south- south of Nigeria.

METHODS

Study Population

The target population comprised of female students of the College of Health Sciences (Faculties of Basic Medical Science and Nursing, and Department of Medical Laboratory Science) and Faculty of Pharmacy of the Niger Delta University in Bayelsa State, Nigeria.

Study design

This study was a cross sectional descriptive survey.

Data collection

Questionnaires were administered randomly to two hundred and fifty consenting respondents. The questionnaire requested for data related to demography, knowledge of cervical cancer, risk factors, screening and vaccination against cervical cancer.

Predefined answer categories (Yes, No, Don't Know, Strongly Agree, Agree, Disagree, Strongly Disagree, Not Sure) were provided.

Data analysis

Statistical package for social science (SPSS) version 20.0 was used for analysis

Percentages of relevant data were obtained and expressed in simple descriptive statistics

Ethical clearance

An ethical approval was granted by the Faculty of Pharmacy Ethical Committee. Respondents also gave their informed consent. Confidentiality of information was maintained

RESULTS

250 questionnaires were administered, out of which 215 were usable, giving a response rate of 86%

Demography

Majority of respondents were aged between 21-25 years (56.7%), Single (80.5%), and have had sexual experience (67%). 44.4% had sexual intercourse debut at age 15-20 years and 49.3% had multiple sexual partners. Majority (59.5%) were of the Ijaw tribe. See Table 1 for details.

Table1: Demographics and Sexual Experience of respondents.

Parameter, n = 215	Frequency (%)
Age (years)	
15 – 20	48 (22.3)
21 – 25	122 (56.7)
26 – 30	37 (17.2)
> 30	8 (3.7)
Marital Status	
Single	173 (80.5)
Married	28 (13.0)
In a relationship	13 (6.0)
Others	1 (0.5)
Tribe	
Hausa	4 (1.9)
Igbo	36 (16.7)
Ijaw	128 (59.5)
Yoruba	21 (9.8)
Others	26 (12.1)
Faculty/Department	
Medical Laboratory Science	20(9.3)
Medicine and Surgery	38 (17.7)
Nursing	95 (44.2)
Pharmacy	62 (28.8)
Ever had sexual intercourse? n = 215	
Yes	144 (67.0)
No	71 (33.0)
Age of Sexual Intercourse debut n = 144	
10 – 14	3 (2.1)
15 – 20	64 (44.4)
21 – 25	44 (30.6)
26 – 30	33 (22.9)
No of sexual partners n = 144	
1	73 (50.7)
2-3	55(38.2)
>3	16 (11.1)

Cervical Cancer Awareness, Prevalence, Screening and Vaccine

Majority of respondents have heard about (85.6%), read about (68.8%) and seen (60.5%) an advert on cervical cancer. About a quarter of respondents (24.7%) had seen a cervical cancer patient while 68.4% had not seen one. 86.5% of respondents did not have cervical cancer; only 7 (3.3%) had cervical cancer; 22(10.2%) were not sure if they had cervical cancer.

Regarding health-seeking behaviour, 51.2% respondents knew what to do if they had CC.

On CC Screening, 163(75.8%) knew its importance; 35(16.3%) had been screened while 175(81.4%) had not been screened for CC. 147(68.4%) and 56(26.0) were unaware and aware of CC vaccine respectively. Table 2

Table 2: Cervical Cancer Awareness, Prevalence, Screening and Vaccine.

Variables, (n = 215)	Yes, N %)	No N (%)	Not Sure N (%)
Do you have cervical cancer?	7(3.3)	186(86.5)	22(10.2)
Have you heard about cervical cancer?	184 (85.6)	22 (10.2)	9 (4.2)
Have you read about cervical cancer?	148 (68.8)	51 (23.7)	16 (7.4)
Have you seen an advert on cervical cancer?	130 (60.50)	70(32.6)	15 (6.9)
Have you seen a patient with cervical cancer?	53 (24.7)	147 (68.4)	15 (6.9)
Do you know what to do if you have cervical cancer?	110(51.2)	104(48.4)	
Do you know the importance of cervical cancer screening? Have you been screened before?	163(75.8) 35(16.3)	52(24.2) 175(81.4)	23(12.3)
Have you heard of cervical cancer vaccine?	56(26.0)	147(68.4)	12(5.6)

Sources of information on cervical cancer

Figure 1 gives details of respondents' sources of information on cervical cancer. The television (40.5%), Seminars (12.1%) Internet and School lectures (7.9%) were the predominant sources of information.

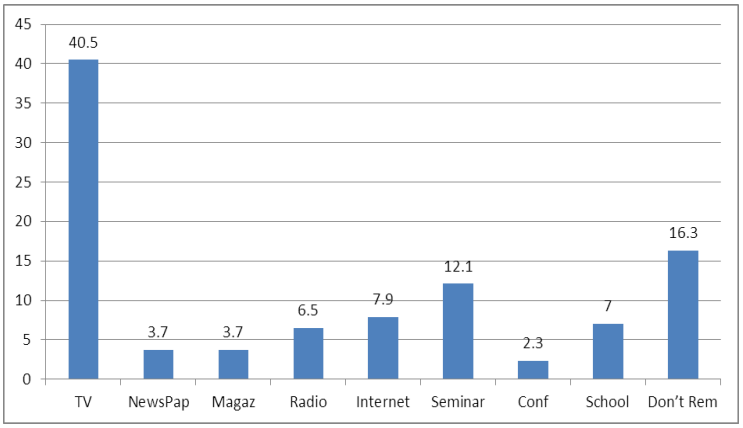

Fig. 1 Sources of Information on Cervical Cancer

Knowledge of Signs/Symptoms of Cervical Cancer

Table 3 gives details of respondents' knowledge of signs and symptoms of CC.

The overall positive knowledge was 49.8%. Respondents identified persistent pelvic pain (73.9%), Vaginal bleeding after menopause (59.1), Vaginal bleeding between periods (58.6%), Vaginal bleeding during or after sex (56.7%), Discharge or pain during sex (56.3%), Irregular menstruation (53.5%) and Vaginal itching (52.1%) as signs and symptoms of CC.

Table 3: Knowledge of Signs/Symptoms of Cervical Cancer

Variables	Strongly agree, N (%)	Agree, N (%)	Disagre, N (%)	Strongly disagree, N (%)	Not sure, N (%)	Positive responses N (%)
Vaginal bleeding between periods	67(31.2)	59(27.4)	8 (3.7)	30(13.9)	51(23.7)	126 -58.6
Persistent pelvic pain	83(38.6)	76(35.3)	6(2.8)	24(12.1)	24(11.2)	159-73.9
Vaginal bleeding during or after sex	65(30.2)	57(26.5)	14(6.5)	3(1.4)	76(35.3)	122-56.7
Vaginal bleeding after menopause	53(24.7)	41(19.1)	17(7.9)	8(3.7)	96(44.7)	94- 43.8
Discharge or pain during sex	66(30.7)	61(28.4)	8(3.7)	7(3.3)	73(33.9)	127- 59.1
Irregular menstruation	69(32.1)	52(24.2)	20(9.3)	4(1.9)	70(32.6)	121- 56.3
Smelly vaginal discharge	58(27.0)	57(26.5)	15(7.0)	8(3.7)	77(35.8)	115- 53.5
Persistent diarrhea	33(15.3)	27(12.6)	35(16.3)	13(6.0)	107(49.7)	60- 27.9
Persistent back pain	42(19.5)	35(16.3)	30(14.0)	12(5.6)	96(44.7)	77- 35.8
Blood in the stool or urine	42(19.5)	43(20.0)	27(12.6)	12(5.6)	91(42.3)	85- 39.5
Abdominal pain	50(23.3)	50(23.3)	21(9.8)	12(5.6)	82(38.1)	100- 46.6
Vaginal itching	40(18.6)	53(24.7)	24(11.2)	11(5.1)	87(40.5)	93- 43.3
Heavier or longer Periods than usual	60(27.9)	52(24.2)	17(7.9)	7(3.3)	80(37.2)	112- 52.1
Overall positive response: 49.8%		107 (49.8%)				

Knowledge of Risks of cervical cancer

The overall positive knowledge response was 44.2%. Respondents positively identified Having many sexual partners (68.4%), Infection with Human Papilloma Virus (HPV) (64.2%), Not going for regular smear or pap test (63.7%), Having a weakened immune system (57.2%) and Starting to have sex before age 17 years (54%) as risks for contracting CC. See Table 4 for details.

Table 4: Knowledge of Risks of cervical cancer

Variables	Strongly agree, N (%)	Agree, N (%)	Disagree, N (%)	Strongly disagree, N (%)	Not sure, N (%)	Positive responses N (%)
Not going for regular smear or pap test	88(40.9)	49(22.8)	20(9.3)	4(1.9)	54(25.1)	137 (63.7)
Having many sexual partners	101(47.0)	46(21.4)	12(5.6)	4(1.9)	52(24.2)	147 (68.4)
Starting to have sex before age 17 years	73(34.0)	43(20.0)	27(12.6)	4(1.9)	67(31.2)	116 (54)
Infection with Chlamydia Trachomatis	59(27.4)	39(18.1)	17(7.9)	10(4.7)	90(41.9)	98 (45.5)
Being a smoker	64(29.8)	46(21.4)	25(11.6)	6(2.7)	74(34.4)	110 (51.2)
Having a weakened immune system	62(28.8)	61(28.4)	17(7.9)	4(1.9)	71(33.0)	123 (57.2)
Infection with Human Papilloma Virus (HPV)	77(35.8)	61(28.4)	6(2.8)	4(1.9)	67(31.2)	138 (64.2)
Long term use of contraceptive pill	54(25.1)	50(23.3)	20(9.3)	12(5.6)	79(36.7)	104 (48.4)
Having many children	31(14.4)	32(14.9)	43(20.0)	25(11.6)	84(39.1)	63 (29.3)
Being sexually inactive	26(12.1)	15(7.0)	48(22.3)	47(21.9)	79(36.7)	41 (19.1)
Having strong immune system	19(8.8)	10(4.7)	53(24.7)	50(23.3)	83(38.6)	29 (13.5)
Having single sexual partner	19(8.8)	14(6.5)	46(21.4)	59(27.4)	77(35.8)	33(15.3)
Overall positive response: 44.2%:		**95(44.2)**				

Respondents' knowledge of cervical cancer screening methods

Regarding knowledge of CC screening methods, 93 (43.3%) of respondents had a positive knowledge of CC screening methods. Respondents positively identified Pelvic examination (64.6%), The Pap smear (59.5%) and HPV testing (59.1%) as CC screening methods. See Table 5 for details.

Table 5: Respondents awareness of cervical cancer screening methods

Variables	Strongly agree N (%)	Agree N (%)	Disagree N (%)	Strongly disagree N (%)	Not sure N (%)	Positive responses N (%)
Pelvic examination	80(37.2)	59(27.4)	4(1.9)	3(1.4)	69(32.1)	139(64.6)
Liquid based cytology	53(24.7)	50(23.3)	11(5.1)	6(2.8)	95(44.2)	103(48.0)
HPV testing	73(34.0)	54(25.1)	7(3.3)	2(0.9)	79(36.7)	127(59.1)
Laser induced fluorescence	41(19.1)	27(12.6)	9(4.2)	6(2.8)	132(61.4)	68(31.7)
Colposcopy	56(26.0)	34(15.8)	7(3.3)	2(0.9)	116(53.9)	90(41.8)
The Pap smear	79(36.7)	49(22.8)	5(2.3)	2(0.9)	80(37.2)	128(59.5)
Cervicography	60(27.9)	50(23.3)	9(4.2)	6(2.8)	90(41.9)	110(51.2)
Polar probe	31(14.4)	33(15.3)	23(10.7)	8(3.7)	120(55.8)	64(29.7)
Urinalysis	29(13.5)	46(21.1)	26(12.1)	9(4.2)	105(48.8)	75 (34.6)
Auto cervical screening techniques	50(23.3)	49(22.8)	13(6.0)	8(3.7)	95(44.2)	99(46.1)
Fasting blood test	27(12.6)	32(14.9)	23(10.7)	21(9.8)	112(52.1)	59(27.5)
Speculoscopy	25(11.6)	26(12.1)	20(9.3)	12(5.6)	132(61.4)	51(23.7)

Overall positive response: 43.3% 93 (43.3%)

DISCUSSION

Most respondents were Single (80.5%) and within the sexually-active age range of 15 -30 years (96.3%). Majority also (67%) had ever had sexual intercourse, mostly debuting at age 15-20 years and nearly half had multiple sexual partners. All respondents were highly educated, being undergraduate health professionals. These data have implications on the risk of developing cervical cancer. The literature has identified various risk factors for developing CV including smoking, parity, education, diet, physical inactivity, sexual behavior, use of oral contraceptives, population growth and aging.[7]

Age

It is claimed that girls younger than 15 rarely develop CC; the risk goes up between the late teens and mid-30s. Women over 40 remain at risk and need to continue having regular cervical cancer screenings, which include both a Pap test and HPV test.[8]

Thus, age-wise, respondents in this study are at risk of developing CC as majority (96.3%) of them were aged between 15- 30 years.

In a recent study, the risk for cervical pre-cancer and cancer was found to be associated with age (≥40 years**),** the median age observed for an invasive cancer diagnosis or positive screening result was 32 years and the mean age (SD) at first sexual intercourse was 19 (4) years.[9] For the general population, a median age of 47 years was found for cervical cancer diagnosis.[10]

Sexual activities

It is reported that women with more than one sexual partner have greater risk of HPV infection with consequently increased risk of developing CC.[9] Similarly, women with partners who in turn have multiple partners are equally at increased risk of contracting CC. This results from the connection between multiple sexual partners and increased risk of contracting HPV which is the agent that causes CC. HPV is considered the most prevalent STI globally and that more than 50% of women that have engaged in sexual practice may have been infected at one point in their lifetime.[11]

Consequently, respondents in this study are at risk of contracting CC because nearly half (49.4%) of them had multiple sexual partners.

In consonance with this study, studies have reported 2-5 lifetime sexual partners among women.[9,12] It is postulated that indiscriminate sexual practices predispose women to develop CC.[13]

Age of initiation of sexual intercourse

In this study, sexual intercourse debuted at 15-20 years for about a third of the respondents. This is in consonance with a study that reported the mean age at first sexual intercourse to be 19 years.[9]

One other risk factor for cervical cancer is early age of initiation of sexual intercourse. This arises from the fact that commencement of squamous metaplasia occurs at puberty and during first pregnancy. Women who had sexual intercourse a year after menarche were shown to have 26-fold increased risk of contracting CC compared with women who had first sexual intercourse after the age of 23 years.[14] Thus, women in this study cohort are at risk of developing CC.

Prevalence of CC

The prevalence of CC in this study was 3.3%. This is lower than the 6% prevalence of cervical pre-cancer and cancer reported in a study population of HIV-positive women.[9]

In Nigeria, CC is the second most common female cancer after breast cancer, with an age standardized incidence rate of 34.5 and 29.0 cases per 100,000 women in 2010 and 2014 respectively.[3,15]

In Sub-Saharan countries, CC is either the most common cancer in women or the second most common cancer (after breast cancer) in women.[16]

The CC incidence per 100,000 in Sub-Saharan Africa is put at 19.1.[16] whereas the world average rate is 15.2 per 100,000.[17]

Eastern Africa has the highest sub regional Incidence of Cervical Cancer (42.7) followed by; Southern Africa (31.5); Middle/Central Africa (30.6); Western Africa (29.3); and Northern Africa (6.6).[15]

Knowledge and Awareness of CC

A majority (85.6%) of the respondents in this study were aware of CC; almost 70% had read about CC; 73.9%, 59.1% 58.6% and 56.7% respectively identified persistent pelvic pain, Discharge or pain during sex, Vaginal bleeding between periods, and Vaginal bleeding during or after sex as signs/symptoms of CC. Further, respondents positively identified Having many sexual partners (68.4%), Infection with Human Papilloma Virus (HPV) (64.2%), Not going for regular smear or pap test (63.7%), Having a weakened immune system (57.2%) and Starting to have sex before age 17 years (54%) as risks for contracting CC. Summarily, therefore, respondents in this study had a high awareness and knowledge of CC. This is not coming as a surprise considering their educational background. These were undergraduate health professionals. This is similar to a study conducted among female health workers in Sokoto, northern Nigeria who demonstrated a very high level of awareness and knowledge of CC.[18] Expectedly, a much lower level of knowledge and awareness was demonstrated in studies among market women in Zaria, northern Nigeria.[19] and among patients in a tertiary centre in south west Nigeria.[20]

Further, a good majority (68.8%) of respondents in this study also claimed to have read about CC and about a quarter of respondents had seen a CC patient. These factors may have

contributed to the high levels of knowledge and awareness demonstrated by respondents in this study.

Many of the respondents obtained their information about cervical cancer from television, seminar, school lecture, magazine, newspapers, radio, internet, conferences etc.

Knowledge and Practice of CC screening

Respondents in this study demonstrated an appreciable level of knowledge of CC screening methods as 64.6%, 59.5%, and 59.1% positively identified Pelvic Examination, The Pap Smear and HPV testing respectively. Further, 75.8% of respondents knew the importance of CC screening.

This is comparable to other studies.[18] but in contra-distinction to others.[19-21]

As it were, knowledge does not always translate to practice. The high level of awareness and knowledge of cervical cancer among respondents in this study never correlated with optimal utilization of CC screening procedures as only 16.3% of respondents had ever been screened for CC. This is similar to 15.4% reported among market women in northern Nigeria.[19] and 18% among female health workers in south east Nigeria.[22] but higher than the 1.78% reported among market women in south east Nigeria.[21] and 3.2% among patients in a tertiary facility in south west Nigeria.[20] Another study among female health workers in northern Nigeria reported 10%.[18]

Albeit, women's knowledge has been correlated with screening uptake; women with low levels of knowledge about CC and its prevention are usually more reluctant and less willing to access screening services.[5]

There is a dire need to increase the screening uptake in this population of respondents that have risk factors for developing CC. In some countries women are actively invited to participate in screening programmes. CC remains a significant cause of cancer death among women in areas where organized screening is not available**.**

The benefits of screening for CC are enormous and include the reduction of the risk of cervical cancer by as much as 80% through regular screening and mortality.[23]

The Papanicolaou (Pap) smear has been designated a prominent tool for CC screening and early diagnosis. It has also been discovered to be a very effective measure for CC prevention.

This tool is widely available and variously demonstrated to decrease mortality rates by as much as 60-90% in some developed countries.[24]

Pap test reduces CC incidence and mortality and it lowers the progression risks of a precancerous lesion to cancer. It is indicated only in asymptomatic women.[25] It offers about 93.5% protection for women aged 35–64 years following annual screening, 83.5% for screening every 5 years, and 64% for screening every 10 years.[26] Also, organized screening has been shown to be capable of reducing CC mortality by 70% or more, deter the loss of large numbers of life years and to also lower disease burden and costs associated with management of advanced disease.[25]

Findings from many studies have suggested that unscreened women were at high risk of cervical cancer.[27,28]

Low utilization of Pap smear has been recorded in Nigeria and other countries.[18,29,30]

It is recommended that all women should begin cervical screening at age 21 years; frequency of performance varies from once a year to once every five years, in the absence of abnormal results.[21,31]

Knowledge and Practice of CC vaccination

A majority, almost 70%, of the respondents had never heard of CC vaccine; only 26% ever heard of CC vaccine. The undergraduate curriculum may be deficient in this regard. Of all the respondents, 4.2% have been vaccinated, 31.6% have not been vaccinated.

Vaccination is regarded as a supplementary intervention for CC prevention; the HPV vaccines help prevent infection from the HPV strains that cause most CC. HPV infection is a necessary condition for CC development.[32] and there are eight HPV genotypes (HPV 16, 18, 45, 31, 33, 52, 58, and 35) which together account for over 90% of CC cases; HPV 16 and 18 are responsible for about 70% of cases globally.[33] There are two HPV vaccines available, an AS04-adjuvanted HPV-16/18 vaccine and a HPV-6/11/16/18 L1 virus-like particle vaccine that covers two non-oncogenic HPV types (HPV 6 and 11), as well as the oncogenic types HPV 16 and 18. Both vaccines have an efficacy of about 98% against the HPV 16 and 18 genotypes, but with different levels of cross-protection against other oncogenic HPV types.[34,35]

The CC vaccines are prophylactically administered and, for adequate protection, should be administered with the three dose series.

CONCLUSION

Majority of women in this study had characteristics and profiles that make them at high risk of developing CC which include Age, multiple sexual partners and early age of initiating sexual activity. Respondents had a high level of CC awareness and knowledge; their level of knowledge of CC risk factors and screening methods was also high. Conversely, CC screening uptake was found to be very low. Similarly, knowledge and practice of CC vaccination was very low. The prevalence of CC was also low in this population.

The study recommends intensive awareness programmes among the population; undergraduate curricula should be beefed up as a platform to inform and educate the students who, in turn, are looked upon to educate the public when they graduate.

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CONFLICT OF INTEREST

None

AUTHORS' CONTRIBUTION

GK: Concept, data analysis and review of draft manuscript

IC: Data collection and analysis; review of draft manuscript

JFE: Concept, data analysis, draft and final manuscript.

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