Determinants Of Knowledge, Attitude And Uptake Of Cervical Cancer Screening Services Among Antenatal Attendees In Rural And Urban Community Health Facilities In Ebonyi State.

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Abstract
Background: *Cervical cancer is a preventable viral disease that can result in morbidity and mortality if vaccination against the causative organism and early detection of the condition are not promptly instituted. Higher girl-child education and availability of health information on the cervical cancer screening services are among the major determinants of the knowledge, attitude and uptake of cervical cancer screening services.*
Objectives: *To compare the determinants of knowledge, attitude and uptake of cervical cancer screening services among antenatal attendees in rural and urban community Health Facilities in Ebonyi State.*
Study Design: *A comparative cross-sectional study involving eligible antenatal attendees from the selected rural and urban Health Facilities in Ebonyi State, Nigeria.*
Methodology: *A total of 440 women attending antenatal clinics from the selected urban and rural Health Facilities in Ebonyi State were recruited using systematic sampling technique. Data were collected with a structured pretested questionnaire capturing socio-demographic characteristics, knowledge, attitude, cervical cancer screening uptake and their determinants. The results were analysed using SPSS version 26 with appropriate tables and figures generated.*
Results: *A higher proportion of urban respondents (66.8%) were categorized as having good knowledge compared to rural respondents (10.9%)(p-value<0.01) and a higher proportion of urban respondents (77.3%) have a positive attitude towards cervical cancer screening compared to rural respondents (27.3%)(p-value<0.01). Majority of respondents in both the rural (76.4%) and urban (55.9%) groups have never been screened for cervical cancer. Respondents with tertiary education were 8 times more likely to be screened compared to those with secondary education (AOR= 8.00, 95% CI: 4.34–14.76, P < 0.01). Lack of health education made respondents 91% less likely to be screened (AOR= 0.09, 95% CI 0.05–0.19, P< 0.01).*
Conclusion: *Educational level and health information on cervical cancer screening services which are higher among the urban women are the major determinants of the knowledge, attitude and uptake of cervical cancer screening services among antenatal attendees.*
Recommendation: *Cervical cancer screening should be integrated into the routine antenatal care services.*
Keywords: *Cervix, Cancer, Determinats, Uptake, Knowledge, Attitude, Screening*

I. Introduction

Cervical cancer is one of the most preventable yet fatal cancers among women worldwide. Cervical cancer is the fourth most common malignancy in women in terms of new cases, with 604,000 new cases and 342,000 deaths recorded in the year 2020[1]. About 90% of these deaths happen in low and middle-income countries (LMICs), where there is limited access to proper cervical cancer screening, vaccination, and managemen[1,2]. Sub-Saharan countries bear the biggest toll in terms of cervical cancer, contributing to 22% of total female malignancy in this group of countries[3].

Despite progress in preventive measures, especially the HPV vaccine and cervical screening in affluent countries, cervical cancer still poses a considerable burden in resource-constrained countries. The inequalities in access to information and preventive healthcare services highlight the large gaps in access to information and preventive healthcare in these countries[1,4]. Incidentally, countries such as Nigeria continue to face high cases of incidence and mortality, making cervical cancer one of the biggest challenges to public healthcare in these countries[5].

The cervix, which represents the lower cylindrical portion of the uterus extending into the vagina, develops from the paramesonephric ducts or Müllerian ducts during embryological development. At about the 6th week of pregnancy, the paramesonephric ducts appear on either side of the urogenital ridge and grow caudally to meet in the midline to form the uterovaginal canal, which gives rise to the uterus, cervix, and upper vagina[6-8]. The caudal ends of the joined ducts give rise to the uterus and the cervix, while the cranial parts give rise to the Fallopian tubes.

The lining of the growing cervix undergoes epithelial differentiation, giving rise to two different epithelia: the columnar epithelium lining the endocervical canal and the stratified squamous epithelium covering the ectocervix. The point where these two different epithelia meet is referred to as the squamocolumnar junction (SCJ), which migrates throughout a female's life because of the effect of hormones, especially during puberty, pregnancy, and menopause[6]. The area between the original and new SCJ is referred to as the transformation zone (TZ), where the process of squamous metaplasia takes place because of the replacement of columnar cells with new squamous epithelium being formed[9].

This transformation zone plays a crucial role in cervical pathology because it represents the origin of almost all cervical intraepithelial neoplasias and invasive cervical carcinomas. The occurrence of squamous metaplasia, though normal, makes the immature metaplastic epithelium vulnerable to infection with high-risk human papillomaviruses, specifically HPV 16 and 18[1,9]. These HPV infections can integrate into the host genome, expressing oncoproteins E6 and E7, which can inactivate the tumor suppressor proteins p53 and retinoblastoma proteins (Rb), thereby contributing to uncontrolled cellular proliferation and genomic instability[10].

Several factors determine the knowledge, attitude and uptake of cervical cancer screening services among women in the rural and urban communities. Such determinants include individual, cultural, economic, and healthcare-related factors. The major advantages of urban women include ease of access to tertiary hospitals, media coverage, and relatively high literacy rates, which help improve access to screening and information resources[11]. However, the challenges facing rural women include difficulties in accessing healthcare due to distances to healthcare centers, financial constraints, unawareness, and deep-rooted cultural beliefs in preventive healthcare practices[12].

Disparities go beyond access in terms of perception and trust. Rural women might depend on conventional healers and general advice from the community, feeling that cervical screening is not necessary and/or violations to privacy or confidentiality might occur. Also, low partner involvement and gender equity can make women less autonomous in accessing cervical screening services[13].

There is puacity of studies on the determinants of the knowledge, attitude and uptake of cervical cancer screening services among antenatal attendees in rural and urban community health facilities in Nigeria and this indeed represents a gap in knowledge which this study will provide answer to. This study aimed to compare the determinants of knowledge, attitude and uptake of cervical cancer screening services among antenatal attendees in rural and urban community Health Facilities in Ebonyi State.

II. Methodology

Study Area: The study was done in Ebonyi State in South-East Nigeria, with data collected from selected urban and rural health facilities that offer antenatal care services. Ebonyi State has 13 Local Government Areas (LGAs), grouped into three senatorial zones; Ebonyi North, Ebonyi Central, and Ebonyi South. The population of the state, according to the 2006 National Population Census, was approximately 2.1 million, projected to exceed 3 million by 2025.

Mile Four hospital is the only secondary health facility located within Abakaliki urban and serves as a referral centre for many communities in the state. Maternal and Child Health Centre (MCH) Azuiyokwu is the only primary health centre located within Abakaliki urban. They attend to the primary health needs of most

Abakaliki urban dwellers. Saint Vincent Hospital Ndubia and Marta Misericordia Hospital Afikpo are the busy rural secondary health facilities in the state located in two different two geopolitical zones in the state. Other secondary health facilities are the General Hospitals located one per Local Government making a total 13 General hospitals in Ebonyi state. Mother and Child Health (MCH) centre Onueke in Ezza south local government area is one of the rural primary health facilities in the state. They offer antenatal care services to rural women in the community.

Study Population: The study population comprised pregnant women attending antenatal clinics at the selected urban and rural health facilities during the study period.

Inclusion Criteria: Pregnant women aged 18 years and above and also women who were attending antenatal care at the selected facilities during the study period.

Exclusion Criteria: Pregnant women who were severely ill or unable to respond to the questionnaire and women who had participated in the pilot phase of the study.

Study Design: The study was comparative cross-sectional study involving 440 women who attended antenatal clinics across the selected urban and rural Health Facilities in Ebonyi State, Nigeria.

Study Tool: A structured interviewer administered questionnaire adapted from standardized measures employed in other studies were used[14,15].

Sample Size: The sample size was 440 comprising 220 eligible women who attended antenatal clinics in the urban Health Facilities and 220 eligible women who also attended antenatal clinics in the rural Health Facilities of Ebonyi State Nigeria within the period of the study. It was determined by a previously validated formula for comparison of two proportions[16].

Sampling Technique: A multi-stage sampling technique was used to select Health Facilities and participants. First, the only secondary and primary Health Facilities in Abakaliki which is the major urban settlement in the State were selected. They were Mile 4 Hospital Abakaliki which is a secondary Health Facility and Mother and Child Health Center Azuiyokwu which is a primary Health Facility. To select a secondary and a primary Health Facility in the rural area, the State was stratified into the three geopolitical zones which are; Ebonyi North, Ebonyi South and Ebonyi central zones. Simple random sampling method was used to select Ebonyi North and Ebonyi central senatorial zones. The zones were further stratified into Local Government Areas with four Local Government Areas in the North and four Local Government Areas in the central. Ebonyi Local Government Area was randomly selected from the North while Ezza South Local Government Area was selected from the South. Saint Vincent Hospital Ndubia was selected from Ebonyi Local Government Area while Mother and Child Health Centre Onueke was selected from Ezza South Local Government Area. Subsequently, antenatal attendees were recruited using systematic sampling during their antenatal clinic visits. The first eligible antenatal attendee who was the starting point of selection was recruited randomly. The interval for the selection of other participants was derived from the sampling fraction which was obtained by dividing the study population by the sample size. The sampling fraction was used to recruit other participants until the sample size was complete.

Data Collection: A pretested structured interviewer-administered questionnaire was used to obtain data in this study. Prior to each clinic day, the research assistants would arrive early and get the list of the antenatal attendees for the day from the midwife in-charge of the antenatal unit. Every third eligible antenatal attendee would be approached based on the predetermined systematic sampling interval. After a description of the aim and methods of the study, the participants gave their informed consent. All the interviews were carried out in a secluded area at the antenatal clinic. For the respondents who were unable to read and write, the interview questions were presented to them orally in their language of choice, and the answers were recorded. All interviews took approximately 25-30 minutes. This allowed sufficient time to clarify any items as well as to obtain accurate information. The completed questionnaires were examined daily by the researcher for consistency. Incomplete or unclear answers were corrected through re-interviewing the same day. Data collection involved strict observance of ethical requirements of respect, voluntariness, and the principles of maintaining anonymity. Participants' details like names and phone numbers were not required. They were given codes in the form of numbers. Supervision was conducted through the office of the Principal Investigator. This involved random spot-checks. Regular weekly debriefing meetings were held among the Research Team to

validate the consistency of the data collection procedures among the urban and rural settings. Data obtained were recorded in the data collection sheets.

Data Analysis: The data were analyzed using the Statistical Package for Social Sciences (SPSS) software version 26.0. Frequency and percentage were used for categorical variables while mean and standard deviation were used for continuous variables. Descriptive analysis was employed to summarize demographics, knowledge levels, as well as screening rates amongst both groups. Bivariate analysis was done using Chi-squared tests to examine the relationship between nominated factors like residency and the use of screening services. T-test procedures were used to compare the mean knowledge and attitude scores between rural and urban respondents. For multivariate analysis; Logistic regression analyses were applied to uncover the independent predictors of cervical cancer screening. The odds ratios (OR) were expressed together with the 95% confidence intervals (CIs), adjusted for the possible confounding factors like age, education, and income. In all statistical analyses, $p<0.05$ (95% confidence interval) was considered significant. Results were presented using tables and figures.

Ethical Consideration: Ethical approval for this study was obtained from the Health Research and Ethics Committee (HREC) of Ebonyi State Ministry of Health. In addition to this approval, permission was sought from the administration of each Health Facility used for the study. Informed written consent was obtained from each participant after adequate counselling and the data obtained from the study were treated with confidentiality and used solely for the purpose of the study.

Limitation of the study:
1. Cross-sectional design precluded establishing causality between determinants and screening uptake.
2. Some information gathered such as those related to screening history involved self-reporting thus, can pose potential threats due to bias in recall.
3. The target population included antenatal attendees which excluded non-antenatal attending women.
4. Inequalities in the health infrastructure available in rural versus urban Health Facilities could have been a factor in respondents' subjective perceptions.
5. Some cultural nuances could have impacted understanding even when the questionnaires were translated.

III. Results:

Table 1 shows the socio-demographic characteristics of respondents by location (urban and rural). The mean age of the urban antenatal attendees was 29.56 ± 4.75 with majority clustering around 25 to 35 years. More than 77% of the participants were married and majority had tertiary education. None of the participants had primary or no education. Most of the participants were employed, mostly traders and civil servants while the rest of the occupations were evenly distributed. More than 90% of the participants were Christians. The parity of the participants were evenly distributed. More than 92% of the urban antenatal attendees reside in the urban locality while only about 7% were rural dwellers but booked and received antenatal care at an urban facility. For the rural antenatal attendees, the mean age of the participants was 26.46 ± 5.14 with majority being between 25 to 35 years. They were mostly married with majority having both secondary school certificate and tertiary education. The remainder had primary education. None of the participants had no formal education. Most of the respondents were traders with fewer civil servants. They were mostly Christians residing at the rural community. Statistically significant difference in the distribution were observed for age ($\chi^2 = 33.45$, $P < 0.01$), level of education ($\chi^2 = 64.22$, $P < 0.01$), occupation ($\chi^2 = 24.67$, $P < 0.01$), religion ($\chi^2 = 12.75$, $P < 0.01$), and parity ($\chi^2 = 10.94$, $P = 0.012$) between the two groups. For marital status, there was no statistically significant difference in distribution between urban and rural respondents ($\chi^2 = 5.04$, $P = 0.081$).

Table 2 shows the level of awareness of cervical cancer and cervical cancer screening amongst urban and rural respondents. A majority of the respondents in the urban area reported being aware of cervical cancer (55.0%), which is higher than the awareness reported by rural respondents (15.0%). For cervical cancer screening, awareness among urban respondents (40.0%) was about two times higher than that of rural respondents (20.0%). However, majority of both rural (80.0%) and urban respondents (60.0%) reported no awareness of cervical cancer screening.

Table 3 Details specific knowledge points about cervical cancer and screening methods by location. The most frequently known risk factor in both groups was smoking (75.9% Urban; 45.5% Rural) which is wrong, while multiple sexual partners was the second most known (55.5% Urban; 40.0% Rural). For screening, Pap smear was the most recognized method, with urban respondents having approximately four times the knowledge of this method (50.9%) compared to rural respondents (14.5%). Furthermore, a higher percentage of urban respondents (68.2%) correctly stated that screening can help prevent cervical cancer, while a majority of rural respondents (68.6%) stated it could not.

Table 4 compares the attitudes towards cervical cancer screening between urban and rural respondents. A greater proportion of urban respondents (64.1%) felt it was important to be screened, and a majority (71.4%) were willing to get screened during pregnancy or in future. In contrast, rural respondents were more likely to report they would feel embarrassed (65.5%) and think screening is painful or dangerous (70.5%). The highest percentage of respondents in both locations (75.9% Urban; 86.4% Rural) agreed that Health workers are the most important group that should encourage screening.

Table 5 Shows the proportion of respondents who have ever been screened for cervical cancer. The majority of respondents in both the rural (76.4%) and urban (55.9%) groups have never been screened for cervical cancer. Screening uptake was higher among urban respondents (44.1%) compared to rural respondents (23.6%). For both groups, the most common place for screening was a public hospital. The primary reason reported for not being screened was that the service was Expensive in the rural area (40.0%), while urban respondents most frequently cited that they" Did not know where to go" (27.3%).

Table 6 Shows the availability of screening services and information provision by location. The majority of respondents in both the rural (69.1%) and urban (53.2%) groups have not received health education on cervical cancer during ANC. However, a higher proportion of urban respondents (46.8%) reported that they have received health education on cervical cancer during ANC compared to 30.9% of rural respondents. A slightly higher percentage of urban respondents (32.7%) also reported that Health Care Workers gave information about screening compared to rural respondents (25.9%). The top two things reported that respondents in both locations agreed would encourage screening were increased Awareness/education and Free/subsidized service.

Table 7 Shows the association between location and the overall knowledge level of cervical cancer. A higher proportion of urban respondents (66.8%) were categorized as having Good Knowledge compared to rural respondents (10.9%). This difference was statistically significant (X^2=144.72, p-value<0.01)

Table 8 Shows the association between location and Cervical Cancer Screening Uptake among the respondents. A higher proportion of urban respondents (44.1%) have undergone cervical cancer screening compared to rural respondents (23.6%). This difference in proportion was statistically significant (X^2=20.55, p-value<0.01).

Table 9 Shows the association between location and the overall Attitude towards Cervical Cancer Screening among the respondents. A higher proportion of urban respondents (77.3%) have a Positive Attitude towards Cervical Cancer Screening compared to rural respondents (27.3%). This difference was statistically significant (X^2=110.23, p-value<0.01).

Table 10 shows the association between socio-demographic variables and cervical cancer screening uptake among urban respondents. The proportion of uptake was highest amongst divorced/separated respondents, those with Secondary Education, students, nulliparous women, and those who received health education on cervical cancer during ANC. The differences in these proportions were found to be statistically significant for marital status (**X^2**= 38.26, P < 0.001), level of education (**X^2**= 48.80, P < 0.001), occupation (**X^2** = 8.20, P = 0.042), parity (**X^2** 20.28, P < 0.001, and receiving health education (**X^2** 34.51, P < 0.01).

Table 11 shows the association between variables and screening uptake among rural respondents. Uptake was highest amongst women aged 25-35 years, divorced, had Secondary Education, unemployed, Grand multiparous, and received health education during ANC. Differences in these proportions were statistically significant for age (X^2= 18.20, P < 0.001), marital status (X^2= 26.45, P < 0.05), level of education (X^2= 6.28, P = 0.043), occupation (X^2= 19.98, P < 0.001), parity (X^2= 35.21, P < 0.01), and receiving health education (X^2 = 51.65, P < 0.01).

Table 12 Shows the predictors of screening uptake among urban respondents. Divorced women were 99% less likely to be screened compared to married women (AOR= 0.01, 95% CI: 0.01–0.28, P< 0.01). Respondents with tertiary education were 8 times more likely to be screened compared to those with secondary education (AOR= 8.00, 95% CI: 4.34–14.76, P < 0.01). Primipara women were 61% less likely (AOR= 0.39, 95% CI: 0.18–0.85, P = 0.018), and multipara women were 67% less likely (AOR= 0.33, 95% CI: 0.18–0.61, P< 0.01) to be screened compared to nullipara women. Respondents who had not received health education on cervical cancer during ANC were 81% less likely to be screened compared to those who had (AOR= 0.19, 95% CI: 0.10–0.33, P< 0.01). These associations were statistically significant.

Table 13 shows the predictors of screening uptake among rural respondents. Women aged 25-35 years were 5 times more likely to be screened compared to those below 25 years (AOR= 4.94, 95% CI:1.85–13.17, P< 0.01). Divorced women were 6 times more likely to be screened than married women (AOR= 5.66, 95% CI:1.96-16.35, P< 0.01). Housewives were 90% less likely to be screened than students (AOR= 0.10, 95% CI: 0.02–0.41, P =0.01). Grandmultipara women were 60 times more likely to be screened than nullipara women (AOR = 59.71, 95% CI:7.13–499.98, P<0.01). Finally, not receiving health education made respondents 91% less likely to be screened compared to those who had received it (AOR= 0.09, 95% CI 0.05–0.19, P< 0.01). These associations were statistically significant.

Table 1: Socio-demographic characteristics of the respondents

Variables	Frequency (n=440)		X^2	P-value
	Rural (220) n(%)	**Urban (220) n(%)**		
Age (*Years*)				
<25	57(25.9)	15(6.8)	33.45	*<0.01
25-35	146(66.3)	168(76.3)		
>35	17(7.7)	37(16.8)		
Mean ± SD	26.46 ± 5.14	29.56 ± 4.75		
Marital status				
Single	46(20.9)	32(14.5)	5.04	0.081
Married	149(67.7)	170(77.3)		
Divorced/Separated	25(11.4)	18(8.2)		
Level of education				
Primary education	52(23.6)	0(0.0)	64.22	*<0.01
Secondary education	87(39.5)	88(40.0)		
Tertiary education	81(36.8)	132(60)		
Occupation				
Housewife	60(27.3)	50(22.7)	24.67	*<0.01
Employed/Self employed	92(41.8)	75(34.1)		
Student	26(11.8)	68(30.9)		
Unemployed	42(19.1)	27(12.3)		
Religion				
Christianity	193(87.7)	213(96.8)	12.75	*<0.01
Islam	27(12.3)	7(3.2)		
Parity				
Nullipara	90(40.9)	79(35.9)	10.94	*0.012
Primipara	50(22.7)	41(18.6)		
Multipara	68(30.9)	92(41.8)		
Place of residence			5.04	0.081
Urban	179(96.1)	204(92.7)		
Rural	8(3.9)	16(7.3)		

Table 2: Awareness of cervical cancer and cervical cancer screening among the respondents

Variables	Frequency (n=440)	
	Urban N(%)	**Rural N(%)**
Ever heard of cervical cancer		
Yes	121(55.0)	33(15.0)
No	99(45.0)	187(85.0)
Ever heard of cervical cancer screening		
Yes	88(40.0)	44(20.0)
No	132(60.0)	176(80.0)

Table 3: Knowledge of cervical cancer and cervical cancer screening among the respondents

Variables	Frequency (n=440)	
	Urban N(%)	**Rural N(%)**
Known causes/risk factors of cervical cancer		
HPV infection (Yes)	93(42.3)	25(11.4)
Multiple sexual partners (Yes)	122(55.5)	57(25.9)
Smoking	167(75.9)	100(45.5)
Poor hygiene	114(51.8)	26(11.8)
Don't know any	108(49.1)	105(47.7)
Screening methods you are aware of		

Pap smear (Yes)	112(50.9)	32(14.5))
VIA(Yes)	8(3.6)	5(2.3)
HPV DNA test (Yes)	21(9.5)	12(5.5)
Don't know any	79(35.9)	171(77.7)
How often women should undergo screening		
Every year (Yes)	57(25.9)	35(15.9)
Every 3 years (Yes)	35(15.9)	27(12.3)
Once in a lifetime (Yes)	69(31.4)	40(18.2)
Don't know	59(26.8)	118(53.6)
Screening can help prevent cervical cancer		
Yes (Yes)	150(68.2)	67(30.5)
No	39(17.7)	151(68.6)
Not sure	31(14.1)	2(0.9)

Table 4: Attitude towards cervical cancer screening among the respondents

Variables	Frequency (n=440)	
	Urban N(%)	**Rural N(%)**
It important for women to be screened		
Yes (Yes)	141(64.1)	70(31.8)
No	34(15.5)	67(30.5)
Not sure	45(20.5)	83(37.7)
Would feel embarrassed getting screened		
Yes	56(25.5)	144(65.5)
No (Yes)	164(74.5)	76(34.5)
Think screening is painful or dangerous		
Yes	74(33.6)	155(70.5)
No (Yes)	56(25.5)	18(8.2)
Not sure	90(40.9)	47(21.4)
Willing to get screened during pregnancy or in future		
Yes (Yes)	157(71.4)	53(24.1)
No	54(24.5)	18(8.2)
Maybe	9(4.1)	149(67.7)
Who should encourage screening		
Health workers	167(75.9)	190(86.4)
Husbands	64(29.1)	35(15.9)
Religious leaders	40(18.2)	28(12.7)
Family/friends	50(22.7)	44(20.0)
Government	99(45.0)	25(11.4)

Table 5: Uptake of cervical cancer screening services among the respondents

Variables	Frequency (n=440)	
	Urban N(%)	**Rural N(%)**
Ever been screened		
Yes	97(44.1)	52(23.6)
No	123(55.9)	168(76.4)
When was screening done		
<1 year ago	11(5.0)	19(8.6)
1-3 years ago	54(24.5)	9(4.1)
>3 years ago	10(4.5)	6(2.7)
Don't remember	22(10.0)	18(8.2)
Location of screening		
Public hospital	69(31.4)	42(19.1)
Private hospital	22(10.0)	4(1.8)
Outreach program	6(2.7)	6(2.7)
Reason for not being screened		
Don't know where to go	60(27.3)	50(22.7)
Expensive	51(23.2)	88(40.0)

Afraid of results	12(5.5)	30(13.6)

Table 6: Availability and Provision of Cervical Cancer Screening Services and Information

Variables	Frequency (n=440)	
	Urban N(%)	Rural N(%)
Received health education on cervical cancer during ANC		
Yes	103(46.8)	68(30.9)
No	117(53.2)	152(69.1)
HCWs here give info about screening		
Yes	72(32.7)	57(25.9)
No	61(27.7)	48(21.8)
Not sure	87(39.5)	115(52.3)
Is screening service available here		
Yes	46(20.9)	96(43.6)
No	89(40.5)	17(7.7)
Don't know	85(38.6)	107(48.6)
What would encourage screening		
Awareness/education	161(73.2)	132(60.0)
Free/subsidized service	140(63.6)	124(56.4)
Spousal/family support	90(40.9)	89(40.5)
Health worker recommendation	111(50.5)	95(43.2)
Availability in facility	156(70.9)	53(24.1)

Table 7: Association between Location and Knowledge Level of Cervical Cancer Screening among the respondents

Variable	Knowledge n=440		X^2	P-value
Location	Good n(%)	Poor n(%)		
Rural	24(10.9)	196(89.1)	144.72	*<0.001
Urban	147(66.8)	73(33.2)		

Table 8 Association between Location and Cervical Cancer Screening Uptake among the respondents

Variable	Uptake n=440		X^2	P-value
Location	Yes n(%)	No n(%)		
Rural	52(23.6)	168(76.4)	20.55	*<0.01
Urban	97(44.1)	123(55.9)		

Table 9: Association between Location and Attitude towards Cervical Cancer Screening among the respondents

Variable	Attitude n=440		X^2	P-value
Location	Positive n(%)	Negative n(%)		
Rural	60(27.3)	160(72.7)	110.23	*<0.01
Urban	170(77.3)	50(22.7)		

Table 10: Relationship between Respondent Characteristics and uptake of cervical cancer screening among urban respondents

Variables	Ever been screened (n=220)		X^2	P-value
	Yes 97 n(%)	No 123 n(%)		
Age				
<25	8(8.2)	7(5.7)	3.99	0.136
25-35	78(80.4)	90(73.2)		
>35	11(11.3)	26(21.1)		
Marital status				
Single	25(25.8)	7(5.7)	38.26	*<0.01
Married	56(57.7)	114(92.6)		

Divorce/separated	16(16.5)	2(1.6)		
Level of education				
Secondary education	64(65.9)	24(19.5)	48.80	*<0.01
Tertiary education	33(34.0)	99(80.49)		
Occupation				
Student	38(39.2)	30(24.4)	8.20	*0.042
Unemployed	7(7.2)	20(16.3)		
Employed/Self employed	33(34.0)	42(34.1)		
Housewife	19(19.6)	31(25.2)		
Parity				
Nullipara	49(50.5)	30(24.4)	20.28	*<0.01
Primipara	16(16.5)	25(20.3)		
Multipara	32(32.9)	60(48.8)		
Grandmultipara	0(0.0)	8(6.5)		
Received health education on cervical cancer during ANC				
Yes	67(69.1)	36(29.3)	34.51	*<0.01
No	30(30.9)	87(70.7)		

Table 11: Relationship between Respondent Characteristics and uptake of cervical cancer screening among rural respondents

Socio-demographic variables	Ever been screened (n=220)		X^2	P-value
	Yes 52 n(%)	**No 168 n(%)**		
Age (*Years*)				
<25	5(9.6)	52(30.9)	18.20	*<0.001
25-35	47(90.4)	99(58.9)		
>35	0(0)	17(10.1)		
Marital status				
Single	11(21.2)	35(20.8)	26.45	*<0.01
Married	25(48.1)	124(73.8)		
Divorced/separated	16(30.8)	9(5.3)		
Level of education				
Primary education	11(21.2)	41(24.4)	6.28	*0.043
Secondary education	28(53.8)	59(35.1)		
Tertiary education	13(25.0)	68(40.5)		
Occupation				
Student	9(17.3)	17(10.1)	19.98	*<0.01
Unemployed	17(32.7)	25(14.9)		
Employed/Self employed	23(44.2)	69(41.1)		
Housewife	3(5.8)	57(33.9)		
Parity				
Nullipara	14(26.9)	76(45.2)	35.21	*<0.01
Primipara	9(17.3)	41(24.4)		
Multipara	18(34.6)	50(29.7)		
Grandmultipara	11(21.2)	1(0.5)		
Received health education on cervical cancer during ANC				
Yes	37(71.2)	31(18.5)	51.65	*<0.01
No	15(28.8)	137(81.5)		

Table 12: Logistic Regression Model for Predictors of Screening Uptake among urban respondents

Socio-demographic variables	OR	95% CI	P-value
Age (*Years*)			
<25	1	-	-
25-35	0.76	0.26-2.19	0.609
>35	0.37	0.11-1.27	0.115
Marital status			
Single	1	-	-
Married	0.45	0.08-2.43	0.350

Divorce/separated	0.01	0.01-0.28	*<0.01
Level of education			
Secondary education	1	-	-
Tertiary education	8.00	4.34-14.76	*<0.01
Occupation			
Student	1	-	-
Unemployed	2.07	0.98-4.35	0.056
Employed/Self employed	0.57	0.20-1.60	0.288
Housewife	1.28	0.62-2.66	0.505
Parity			
Nullipara	1	-	-
Primipara	0.39	0.18-0.85	*0.018
Multipara	0.33	0.18-0.61	*<0.01
Grandmultipara	0	0	0.999
Received health education on cervical cancer during ANC			
Yes	1	-	-
No	0.19	0.10-0.33	*<0.01

Table 13: Logistic Regression Model for Predictors of Screening Uptake among rural respondent

Socio-demographic variables	OR	95% CI	P-value
Age (*Years*)			
<25	1	-	-
25-35	4.94	1.85-13.17	*<0.01
>35	0	0	0.998
Marital status			
Single	1	-	-
Married	0.64	0.29-1.43	0.278
Divorce/separated	5.66	1.96-16.35	*<0.01
Level of education			
Primary education	1	-	-
Secondary education	1.77	0.79-3.95	0.164
Tertiary education	0.71	0.29-1.74	0.456
Occupation			
Student	1	-	-
Unemployed	1.28	0.47-3.55	0.629
Employed/Self employed	0.63	0.25-1.61	0.333
Housewife	0.10	0.02-0.41	*0.01
Parity			
Nullipara	1	-	-
Primipara	1.19	0.48-2.99	0.709
Multipara	1.95	0.89-4.28	0.094
Grandmultipara	59.71	7.13-499.98	*<0.01
Received health education on cervical cancer during ANC			
Yes	1	-	-
No	0.09	0.05-0.19	*<0.01

IV. Discussion

This study demonstrated a minute discrepancy between the knowledge of the urban and the rural participants, however, the attitudes towards the cervical cancer screening were significantly higher among the urban antenatal attendees. The uptake of cervical cancer screening services was extremely low among the urban and rural participants.This illustrates a rather complicated relationship between knowledge, attitude and behavior. Knowledge seems to be more or less equal since the awareness about cervical cancer screening has been general and quite superficial. The pregnant women attending antenatal in the urban Health Facilities had more positive attitudes towards the practice likely due to their greater exposure to health education programs and mass communication campaigns. The rates remained very low in both the urban and rural participants because of the role of cost and lack of accessibility. The observations in this study were in agreememt with the previous studies carried out in Nigeria and other Sub-Saharan countries. In the above mentioned studies, the

existence of awareness of cervical cancer screening has been observed but has failed to translate into actual use[11,17,18]. The reports from these studies with respect to the field of reproductive health can be quite extensive.

Cervical cancer can be prevented to a large extent because the risk factors are well known. Apart from human papilloma virus infection, there are behavioral, socio-demographic, and environmental factors that affect it. Women belonging to lower socioeconomic status, less educated women, and women residing in rural areas tend to be diagnosed with cervical cancer in the late stages of the disease[17]. Misconceptions about cultural belief systems, women and gender issues, and also misunderstandings about the procedure related to cervical screening contribute to low turnout in cervical screening programs[5].

Reproductive factors such as high parity, prolonged use of hormonal contraceptives, and early age at first birth have similarly been implicated in the risk of HIV infection[19]. These risk factors are not uncommon among women who go for antenatal care in Nigeria and offer a special window for intervention in pregnancy[17].

Disparities in rural and urban areas play an essential role in affecting the accessibility and utilization of cervical cancer screening services. Urban women tend to enjoy better access to information on health, education, income, and access to well-equipped healthcare facilities, which facilitate enhanced utilization of cervical cancer screening services[5,17]. On the other hand, women in rural areas tend to experience constraints in terms of geographic distances, cultural restrictions, and unavailability of transportation networks to facilitate access to preventive services[5,20].

Research in Sub-Saharan Africa has consistently made it clear that women in urban areas are more prone to cervical cancer screening relative to women in rural areas[21]. In Nigeria, women in major cities such as Lagos, Abuja, and Enugu tend to exhibit enhanced knowledge and utilization of cervical cancer screening mainly because of access to Tertiary Healthcare Centers and mass media resources, unlike women in rural areas who primarily depend on Primary Healthcare Centers and tend to be less aware of the importance of cervical cancer screening and access to related resources[5].

There are socioeconomic aspects that further perpetuate these inequities. The state of poverty, reduced literacy, and stronger adherence to conventional belief structures concerning healthcare might occur in rural women, which in turn poses the risk of contradictions in biomedically oriented screening processes[17]. Additionally, healthcare professionals in rural areas might not be well-equipped with information concerning the prevention of cervical cancer nor possess adequate resources to properly execute any corresponding screening process[5]. The inequality between rural and urban settings is not only physical and regional, but it can be structural and information-based as well. The healthcare centers in rural Nigeria are largely understaffed and underfinanced, with very low levels of health promotion activities happening there[5].

There are numerous barriers to cervical cancer screening, varying from individual level to healthcare system constraints, especially in low and middle-income countries. The barriers are complex in nature and context-specific. Lack of knowledge on cervical cancer and the importance of cervical screening is one of the most enduring challenges there is today[5,17].

Health sector-related challenges include: inadequate infrastructure, human resources, and the absence of consumables needed in conducting screening processes[5,21]. Also, most Primary Healthcare Centers in Nigeria do not provide Pap smear services, while the referral process in cases of abnormal findings has not been well attended to either. The third factor is the issue of payment, since most women in Nigeria, because of the absence of insurance coverage pay directly though the process is not very costly[1].

Fear of pain, embarrassment, or getting a positive result act as a discouraging factor for most women to take part in the program[5]. The association of cervical cancer with a death sentence makes it even worse for women to take part in cervical cancer screening programs.

In Nigeria, the prevention of cervical cancer has not yet been accorded the same level of policy attention that has been given to other infectious diseases such as malaria or HIV/AIDS. The absence of a comprehensive cervical cancer-screening program in the country in addition to piecemeal implementation at the state level has been considered to limit consistency and sustainability in cervical cancer control in Nigeria[5].

The cervical cancer screening barriers are thus, multiple and intertwined. Knowledge about these difficulties concerning cervical cancer screening programs can play a crucial role in devising strategies to improve uptake in antenatal women.

V. Conclusion

Educational level and health information on cervical cancer screening services which are higher among the urban women are the major determinants of the knowledge, attitude and uptake of cervical cancer screening services among antenatal attendees.

VI. Recommendations

1. Further research should be conducted in the future to examine the causal relationship pathways and cultural factors that influence the effectiveness of integrated cervical cancer screening programs.

2. Cervical cancer screening should be integrated into the routine antenatal care services.
3. Globally the Health Ministries should develop a policy that specifies screening during reproductive health visits.

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