

**KNOWLEDGE AND ATTITUDE OF FEMALE WORKERS IN SELECTED RURAL
LOCAL GOVERNMENT AREAS OF IMO STATE, NIGERIA TOWARDS CERVICAL
CANCER AND ITS SCREENING*****¹Peter O. Nwadike, ²Sylvia O. Anyadoh-Nwadike, ²Chukwunonyerem Ogwunga and ³I.N.S. Dozie**¹Department of Public Health, Texilla American University, Guyana.²Department of Biotechnology, Federal University of Technology, Owerri, Imo State, Nigeria.³Department of Public Health, Federal University of Technology, Owerri, Imo State, Nigeria.***Corresponding Author: Peter O. Nwadike**

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Article Received on 22/03/2025

Article Revised on 12/04/2025

Article Accepted on 02/05/2025

ABSTRACT

Cervical cancer is a leading cause of morbidity and mortality among women in low- and middle-income countries. Despite its preventable nature through vaccination and early screening, awareness and participation in screening programs remain low, particularly in rural areas. **Purpose:** This study was aimed at determining the knowledge and attitude of female workers in selected rural Local Government Areas of Imo State towards cervical cancer and its screening. **Methodology:** Data was collected using validated open-ended, semi structured questionnaire. After responses to the questionnaire were received, seminar on Cervical cancer and its screening was delivered to the respondents. Afterwards, a second set of same questionnaire was administered to same respondents. Total of 460 women of reproductive age were randomly selected from 6 different rural LGAs of Imo State, Nigeria upon their informed consent. Data obtained/responses were analyzed using simple percentage. Chi-square test was used to assess relationship by testing the hypothesis. **Result:** Results revealed revealed poor baseline knowledge and attitude towards cervical cancer screening; before the seminar, a high average percentage 72.2% (332) of respondents had not heard of cervical cancer while 27.8% (128) have heard. Of those that know about Cervical cancer, average of 90 (70.3%) showed low knowledge. Majority of respondents 366 (79.6%) had poor attitude to screening. They mostly implicated lack of awareness 205 (44.6%) and lack of fund 104 (22.6%) as major reasons for not participating in the screening test. Few 128 (27.8%) agreed to go for screening and vaccination. After the awareness, 400 (87%) agreed to go for the screening test and vaccination if free/affordable. None of the participants had ever been screened. Significant relationship between attitude to cervical cancer and level of knowledge as well as academic level and attitude to cervical cancer screening were obtained. **Conclusion:** This calls for urgent continued enlightenment on cervical cancer screening to improve cervical cancer screening uptake among women in rural Nigeria especially as soon as sexual activity begins.

KEYWORDS: Cervical cancer, Knowledge, Attitude, screening, awareness, rural Nigeria.**1. INTRODUCTION**

Cervical cancer is the fourth most common cancer among women worldwide, with the highest incidence and mortality rates recorded in low- and middle-income countries, including Nigeria (WHO, 2024). Human papillomavirus (HPV) infection is the primary cause of cervical cancer, and early detection through screening significantly reduces morbidity and mortality rates (Dozie et al., 2020; Ogwunga et al., 2020). However, studies have shown low levels of awareness and screening uptake in Nigeria, particularly in rural areas where access to healthcare services is limited (Oluwole et al., 2017).

In Nigeria, cervical cancer ranks as the third most common cancer and the second most frequent cause of

cancer deaths among women aged 15-44 years (United Nations Africa Renewal, 2024). Limited access to screening facilities, low awareness, and sociocultural factors contribute to the high disease burden. Many women in rural areas lack the necessary information about cervical cancer risk factors, screening procedures, and available preventive measures (Anorlu et al., 2008). Additionally, fear, stigma, and misconceptions about cervical cancer screening further discourage women from seeking early diagnosis and treatment (Ogwunga et al., 2020).

Effective prevention strategies, including HPV vaccination and regular screening, have significantly reduced cervical cancer incidence in developed countries. However, in Nigeria, barriers such as cost, lack of

government-supported HPV vaccination programs, and inadequate public health campaigns hinder uptake and progress (Bruni et al., 2019). Addressing these gaps through targeted awareness programs is critical in promoting early detection and reducing mortality rates associated with cervical cancer.

2. AIM AND OBJECTIVES

2.1 Aim

This study was aimed at assessing and improving the knowledge and attitudes of female workers in six selected rural Local Government Areas (Ezinihitte Mbaise, Ngor Okpala, Ohaji/Egbema, Ideato South, Ihitte Uboma and Obowo) of Imo State, Nigeria, towards cervical cancer and its screening before and after an awareness program.

2.2 Objectives

The specific objectives of this study were to.

1. Determine the baseline knowledge on cervical cancer and its screening among female workers in rural Imo State.
2. Assess the attitudes of female workers towards cervical cancer screening before and after an awareness seminar.
3. Identify key barriers preventing participation in cervical cancer screening.
4. Evaluate the influence of level Knowledge of cervical cancer and its screening on respondents' attitude towards its screening uptake.
5. Assess the impact of educational/academic level on Knowledge of cervical cancer and its screening
6. Possibly proffer strategies for sustainable cervical cancer awareness and screening uptake in rural communities.

3. METHODS

3.1. Study design: A cross-sectional descriptive survey was conducted across six rural LGAs in Imo State. The LGAs were randomly selected from the three senatorial zones of the State; Imo East, West and North. Two LGAs were selected per zone.

A target of 600 female LGA workers of reproductive age (100 from each study LGA) was projected to be randomly selected from the 6 different study LGAs to participate in the study. However, 460 gave their informed consent for the study.

Baseline data were collected from the respondents using validated open-ended, semi structured questionnaire marked A1-100. The questionnaire included sections on demographic characteristics, knowledge of cervical cancer, its risk factors, and attitudes towards screening. After responses to the questionnaire were submitted by respondents, awareness seminar on Cervical cancer and its screening was delivered via powerpoint presentation. Afterwards, a second set of same questionnaire marked B1 -100 was administered to the same respondents.

3.2. Inclusion criteria

Study subject must be:

1. a female
2. Staff of the Local Government Area
3. between reproductive ages of 16 and 55-year-old
4. Resident within the study LGA

3.3. Exclusion Criteria

Study subject must not be

1. Mentally disabled
2. Below the age 16 years
3. Above 55 years

3.4. Validity of the instrument

Both sets of structured questionnaires were examined by the researcher's supervisor for review and correction. The supervisor and two other lecturers ascertained the face and content validity of the instrument. Corrections made were effected appropriately.

After effecting the corrections made by the experts, a scale level content validity index/Universal Agreement, (S-CVI/UA) of 0.931 was obtained for the general questionnaire as all experts scored 93.1% of the questionnaire items 3 - 4 on a 4-point scale from not relevant (1) to highly relevant (4). The questionnaire for ambassadors garnered a higher validity index/Universal Agreement, (S-CVI/UA) of 0.96. The final copies of the instruments were then produced.

3.5. Reliability of the instrument

Both structured questionnaires were pilot tested according to standard practice in a similar population. Ten women within the expected age range of the study population for clarity and reliability working in Owerri north LGA were used for the pilot-testing. Data obtained were appropriately analyzed statistically using the Cronbach's Alpha model of test of internal consistency. A reliability coefficient of 0.933 and 0.929 (>0.9) were obtained for the respective sets of questionnaire which indicated that the reliability of the both test instruments was very strong.

3.6. Ethical permission

Ethical permission was sought and obtained from the School of Biological Sciences ethical committee of the Federal University of Technology Owerri, upon presentation of the research proposal. The ethical permission from the University was presented to the Local Government management for verification, and clearance upon arrival at the Local Government Area. Consequently, the proposal was presented to the Local Government Area chairman and management team with appropriate briefing on the research and the protocols for their approval and subsequent support.

3.7. Informed consent

Prior to recruitment for participation, the possible subjects/study participants were properly educated on the objectives of the study. They were assured of their

confidentiality and anonymity. They were also assured that no harm would be caused through the study process.

3.8. Data Analysis: Data obtained/responses were presented using descriptive statistics and analyzed using simple percentage. Chi-square test was also used to assess relationship of knowledge to attitude as well as educational level and knowledge.

To assess knowledge, the methods of Odusanya and Tayo (2001) was used with a little modification; correct answers to questions were scored one, while wrong answers scored zero. The total score was calculated by adding all the scores and converting to percentages. Knowledge grade will be assigned to each respondent based on their total percentage score: 0 - 49% = Poor; 50 - 69% = Fair; 70 - 100% = Good.

4. RESULTS

4.1. Sociodemographic characteristics of Respondents

The socio-demographic characteristics of the respondents are shown below in Table 1 below. The highest number

of respondents (31.5%) were within the age range 40 years and above while the least (7.6%) were in the age bracket of 18 and 24 years. Married women were highest (68.5%) respondents. Interestingly, there was no divorced woman among the respondents. Majority of the respondents (98.5%) practiced Christianity, there was no respondent practicing Islamic religion.

The highest proportion of respondents (42%) attained Secondary education followed by tertiary education (41.7%) while a few (3%) had no formal education. the level of education with highest number of respondents was secondary level. The difference was however not statistically significant between secondary and tertiary education. In terms of parity, majority (45.4%) had 4 to 6 children. Interestingly percentage of those who had above 6 children (12.6%) and number of those without children (12.8%).

Table 1: Demographic characteristics of respondents.

Variables	Demographic Characteristics	Number of respondents (N=460)	Percentage of respondents (N=460)
Age (years)	20-24	35	7.6
	25-29	63	13.7
	30-34	100	21.7
	35-39	117	25.4
	40+	145	31.5
Marital Status	Single	57	12.4
	Married	315	68.5
	Widowed	72	15.7
	Divorced	0	0
	Separated	16	3.5
Religion	Christianity	453	98.5
	Islam	0	0
	Others	7	1.5
Educational level	None	14	3.0
	Primary	61	13.3
	Secondary	193	42.0
	Tertiary	192	41.7
Number of Children/Parity	0	59	12.8
	1-3	134	29.1
	4-6	209	45.4
	Above 6	58	12.6

4.2. Baseline and post-awareness Knowledge: Before the awareness seminar, only 27.8% of the respondents had heard of cervical cancer, and 21.7% knew its cause (Table 1). The majority (78.3%) were unaware of the role of HPV in cervical cancer development. Similarly, only 21.7% had heard of the Pap smear test, and 21.7% knew about the HPV vaccine. Of those that know about Cervical cancer, average of 90 (70.3%) demonstrated low knowledge. The knowledge gap was more pronounced among respondents with lower educational

levels, highlighting the need for targeted education and outreach. Following the awareness seminar, all respondents (100%) demonstrated improved knowledge of cervical cancer and screening. Notably, 77.2% of respondents could correctly identify HPV as a primary cause of cervical cancer, and all respondents expressed willingness to undergo screening. The significant increase in knowledge across all LGAs suggests that structured awareness programs can have a meaningful impact on improving health literacy in rural communities.

Table 2: Knowledge of cervical cancer and its screening in rural areas N = 460

Questions	Responses	Before Awareness		After Awareness		Chi-square (P value)*
		Frequency	Percent	Frequency	Percent	
Have you heard of cervical cancer	YES	128	27.8	460	100	516.3 (<0.0001)**
	NO	332	72.2	0	0	
Do you know what causes cervical cancer	YES	100	21.7	460	100	588.1 (<0.0001)**
	NO	360	78.3	0	0	
Causes of Cervical cancer	Sexual transmission	37	28.9	82	17.8	166.4 (<0.0001)**
	HPV	38	29.7	355	77.2	
	Multiple sexual partner	25	19.5	23	5.0	
	I don't know	28	21.9	0	0	
Have you heard of Pap smear test	YES	90	21.7	460	100	615.6 (<0.0001)**
	NO	370	78.3	0	0	
Have you heard of HPV Vaccine	YES	91	21.7	460	100	612.8 (<0.0001)**
	NO	369	78.3	0	0	

*Chi-square analysis across knowledge status of the respondents. **Significant observations.

4.3. Baseline and post-awareness attitude towards cervical cancer screening

At baseline, majority of respondents 366 (79.6%) had poor attitude to screening. They mostly implicated lack of awareness 205 (44.6%) and lack of fund 104 (22.6%)

as major reasons for not participating in the screening test. Few 128 (27.8%) agreed to go for screening and vaccination. After the awareness, 400 (87%) agreed to go for the screening test and vaccination if free/affordable.

Table 3: Respondents' Attitude towards cervical cancer screening in Rural areas. N = 460

Questions	Response	Before awareness		After awareness		Chi-square (P value)*
		Number	Percent	Number	Percent	
Will you submit yourself to screening test	YES	94	20.4	400	87	406.7 (<0.0001)**
	NO	366	79.6	60	13	
Will you take HPV Vaccine	YES	90	22.6	399	73.7	414.1 (<0.0001)**
	NO	370	77.4	61	13.3	
what if both test and vaccine are free	YES	128	72.2	400	87	326.4 (<0.0001)**
	NO	332	27.8	60	13	

*Chi-square analysis across awareness status of the respondents. **Significant observations.

4.3. Sources of Information on cervical cancer

It was observed that medical personnel were the primary baseline source of information (57%), followed by social

media (40.6%), while newspapers accounted for only 2.4% (Figure 1).

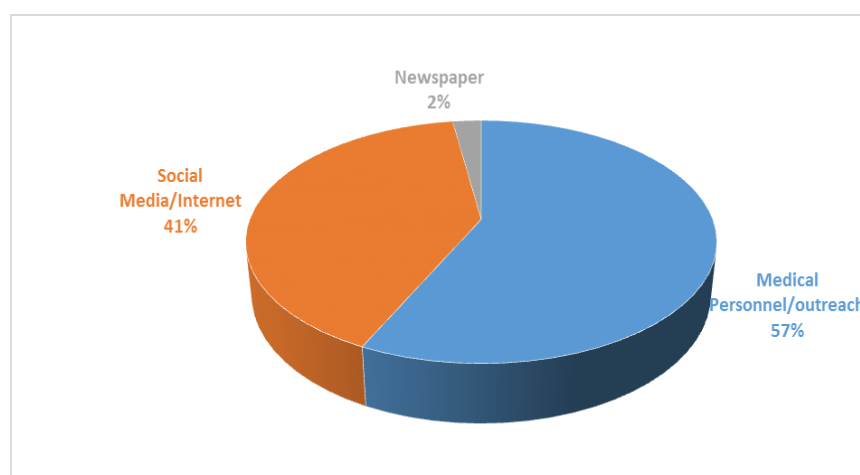


Figure 1: Baseline Sources of Information on cervical cancer and its screening.

4.4. Barriers to Screening

Before the seminar, common reasons for not participating in screening included lack of accurate knowledge (56%), followed by lack of fund/cost (28.4%), interestingly, culture posed no barrier (0%) Figure 2. Other respondents also cited religious constraints, feeling of being healthy and concerns about fear of the pain or

discomfort associated with screening procedures as well as the unknown. Post-intervention, these concerns significantly declined, with most participants (99%) indicating a willingness to undergo screening if services were made accessible, available and affordable.

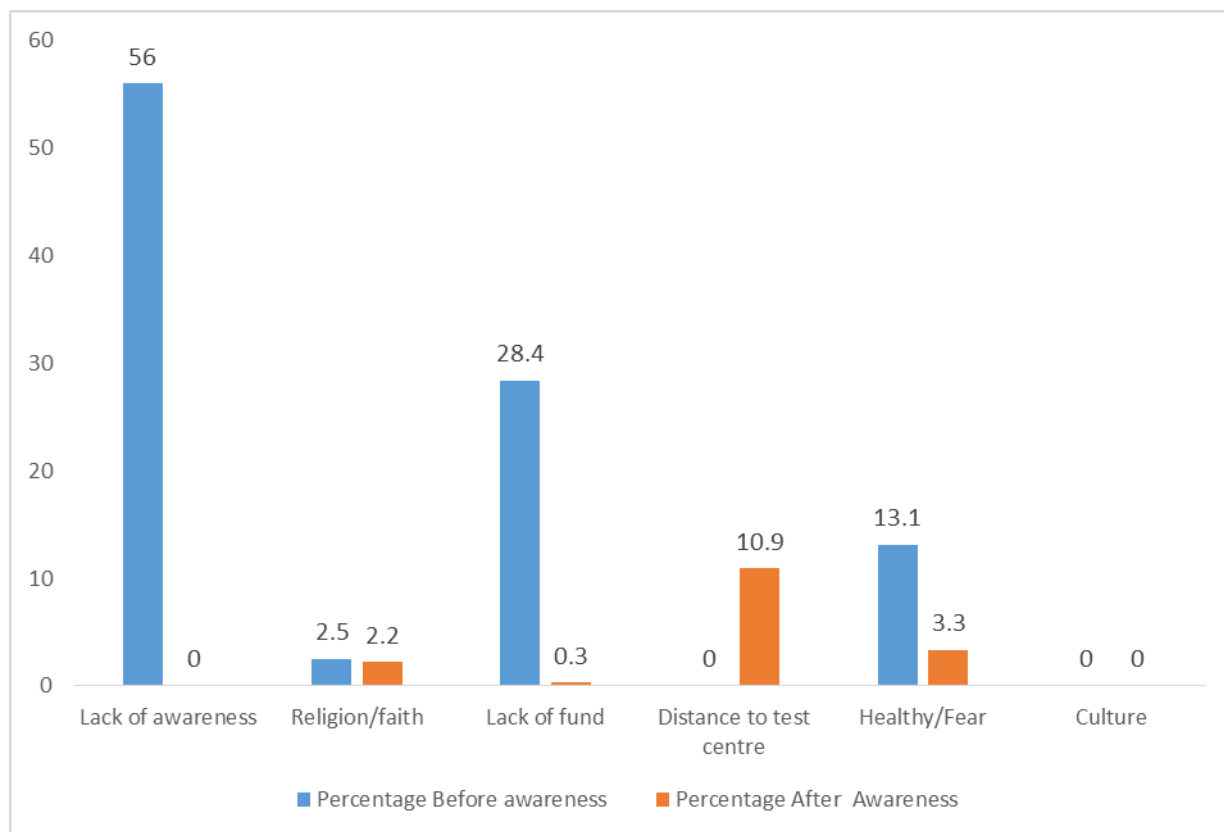


Figure 2: Identified Barriers to screening pre- and post-awareness.

4.6. Relationship between level of knowledge on cervical cancer and attitude towards screening for cervical cancer

Results (Table 4), revealed that the knowledge and attitude of the respondents after the awareness were much better than the knowledge and attitude of the respondents before the awareness. Before awareness, only 8.3% of respondents had good knowledge while 72.2% had poor knowledge. On the other hand, 366(79.6%) had unfavourable attitude towards CC

screening at baseline. Post-awareness, majority of the respondents improved in their knowledge level (95.6%) up to fair knowledge, about the cancer while 87% developed favourable attitude towards its screening.

Generally, at post-awareness, **395**(85.9%) of the 460 respondents showed good knowledge as against 38 (8.3%) at baseline while poor knowledge reduced from 72.2% to 4.4%.

Table 4: Assessment of respondents' Level of Knowledge and attitude before and after awareness.

Variables	Grade		Frequency, No (%)
Knowledge	Before Awareness	Good	38 (8.3)
		Fair	90 (19.5)
		Poor	332(72.2)
	After Awareness	Good	395(85.9)
		Fair	45(9.7)
		Poor	20(4.4)
Attitude	Before Awareness	Favourable	94(20.4)
		unfavourable	366(79.6)
	After Awareness	Favourable	400(87)
		unfavourable	60(23)

4.5 Test of Significant Association between attitude and knowledge before and after awareness

From Table 5 below, result analysis to determine relationship between respondents' level of knowledge and attitude towards cervical cancer and its screening, revealed that the attitude of the respondents were significantly ($p < 0.0001$) negatively affected by their poor knowledge of the cancer.

At baseline, only 94 respondents had favourable attitude, out of these, 86 (91.5%) had upto fair knowledge of Cervical cancer and its screening while for those with unfavourable attitude, only 11.5% had fair knowledge while none had good knowledge of the Cancer. However, after awareness, 400 respondents showed favourable attitude with 97.3% of these having good knowledge while only 0.5% still claimed poor knowledge.

Table 5: Attitude vs Knowledge Cross tabulation before awareness.

Attitude		Total	Number (%) Level of Knowledge			Chi-square (P value)*
		Respondents	Good	Fair	Poor	
Baseline	Favourable	94	38 (40.4)	48 (51.1)	8 (8.5)	274.2 (<0.0001)**
	Unfavourable	366	0 (0)	42 (11.5)	324 (88.5)	
	Total	460	38 (8.3)	90 (19.6)	332 (72.2)	
Post-Awareness	Favourable	400	389 (97.2)	9 (2.3)	2 (0.5)	328.6 (<0.0001)**
	Unfavourable	60	6 (10)	36 (60)	18 (30)	
	Total	460	395 (85.9)	45 (9.7)	20 (4.4)	

**Significant observations

Null and Alternative Hypothesis

H_0 : There is no relationship between level of Knowledge of respondents and their attitude towards cervical cancer and its screening.

H_1 : There is a significant relationship between level of Knowledge of respondents and their attitude towards cervical cancer and its screening.

The analysis revealed that attitude towards issues of the cancer became significantly ($p < 0.0001$) favourable after awareness with improvement in respondents' knowledge levels. Hence, the null hypothesis was rejected. It was therefore concluded that there is a significant relationship between Level of Knowledge of respondents and their attitude towards the cervical cancer screening across the study areas.

4.6. Test of Significant Association between educational level and knowledge of cervical cancer

From Table 6 below, result analysis to determine relationship between respondents' level of education and knowledge of cervical cancer and its screening at baseline, revealed that the knowledge of the respondents were significantly ($p < 0.0001$) affected by their level of academic attainment.

For those who had tertiary education, 26 (13.5) had good knowledge while non of those with primary education had good knowledge. Up to 92.9% of those who had no formal education showed poor knowledge while the percentage of those who had up to tertiary education with poor knowledge was lowest at 56.3%.

Table 6: Education vs Baseline Knowledge of cervical cancer and its screening.

Level of Education	Total	Number(%) Level of Knowledge			Chi-square (P value)*
	Respondents	Good	Fair	Poor	
No formal education	14	1 (7.1)	0 (0)	13 (92.9)	47.12 (<0.0001)**
Primary	61	0 (0)	12 (18.8)	49 (76.6)	
Secondary	193	11 (5.7)	20 (10.4)	162 (83.9)	
Tertiary	192	26 (13.5)	58 (30.2)	108 (56.3)	
Total	460	38 (8.3)	90 (19.6)	332 (72.2)	

Null and Alternative Hypothesis

H_0 : There is no relationship between educational level of respondents and Level of Knowledge of Cervical cancer and its screening

H_1 : There is a significant relationship between educational level of respondents and Level of Knowledge of Cervical cancer and its screening.

Since $P < 0.0001$, the null hypothesis was rejected and it was concluded that there is a relationship between educational level of respondents and their Level of

Knowledge of cervical cancer with knowledge increasing as educational level increased.

5. DISCUSSION

The findings of this study revealed a critical low level of cervical cancer awareness and screening uptake among female workers in rural Imo State. Similar studies in Nigeria and other African countries have also reported low knowledge and participation rates in cervical cancer screening programs (Walker *et al.*, 2002; Bisi-Onyemaechi *et al.*, 2018). Among the respondents that were aware of cervical cancer, significantly ($p < 0.0001$)

higher proportions heard about it through medical personnel/outreach (57.0%) than other media (Figure 1). This suggests that face-to-face interactions with healthcare professionals are more effective in disseminating accurate health information compared to traditional print media. These findings are consistent with a study by Denny et al. (2006), which emphasized that community-based interventions are essential for improving cervical cancer screening in rural areas.

Before creation of cervical cancer awareness, the majority (56.0%) of rural respondents hinged their reason for not taking the test or vaccine on lack of awareness followed by lack of fund. This corroborates earlier reports that there is dearth of health education and awareness in rural areas (Denny et al., 2006; Smith and Doe, 2021) and this significantly affects health seeking behaviours in rural areas (Anorlu et al., 2008; Aongo et al., 2019).

There was dramatic increase in knowledge (Table 1) and willingness to undergo screening post-awareness (Table 2). The positive shift in attitudes post-awareness creation was evident, with 100% of respondents expressing willingness to undergo screening and recommending it to others. Those that were scored with poor knowledge still claimed knowledge and made up the 100% but their knowledge scores were below 50%. This suggests that exposure to accurate information via targeted health education programs can significantly improve health-seeking behaviour and cervical cancer screening uptake as opined by Makadzange et al., (2022). This finding corroborates other studies on effectiveness of targeted health educational interventions in diverse settings (Rajmohan et al, 2020; Makadzange et al., 2022; Zhang et al., 2022). Studies by Agurto et al. (2004) and Tesfaye et al. (2019) have similarly highlighted the transformative impact of structured awareness programs on increasing cervical cancer knowledge among underserved populations. However, sustainable intervention strategies, including continuous mentorship and community-based health campaigns, are necessary to translate knowledge into action.

Despite improvements in knowledge post-intervention, structural barriers such as inadequate screening centers, high costs, and limited access to trained medical personnel remain key challenges in rural areas, similar findings were reported by Wilson and Rampa, (2015). Addressing these barriers requires a multi-sectoral approach involving government agencies, non-governmental organizations, and community health workers to improve access to screening and treatment facilities. The initial reluctance or lack of awareness among rural respondents possibly indicates systemic barriers such as cultural misconceptions, financial constraints, and/or inadequate healthcare infrastructure. These barriers should be addressed to achieve long-term health-seeking behaviour change.

Even at baseline, the provision of free tests and vaccines significantly improved attitudes across all groups ($p=0.0265$). This could be attributed to most respondents (68.5%) being married and mostly (45.4%) with 4 - 6 children, hence funding the screening would cause more burden on them. This underscores the important role of funding in health care facilities. These outcomes align with Shrestha et al. (2018), who highlighted the importance of economic incentives in driving healthcare adoption in low-income communities.

Religious beliefs and fear continue to influence health-seeking behaviors even after intervention. Some women in rural areas perceive cervical cancer screening as unnecessary or associate it with moral judgment. Interestingly culture was not found as being a barrier to screening uptake in the areas studied, this underscores improvement in cultural beliefs within Imo state, Nigeria as culture has been variously implicated in different parts of Nigeria and Africa as a common barrier to health-seeking behaviours (Isa et al., 2016; Onuoha et al., 2024) even in rural areas of United States of America as reported by Wilson and Rampa, (2015). This could be attributed to the fact that 98.5% of the respondents were Christians (Table 1), this exposure possibly increased their exposure and shifted their attachment to cultural perceptions/beliefs. However, ongoing health education and use of ambassadors should be part of the top priorities of the LGA management in collaboration with community leaders and civil society organizations. Health education campaigns should involve community leaders, religious institutions, and trusted figures to improve appropriate knowledge, dispel myths and encourage participation in screening programs.

Test of the influence of level of respondents' knowledge of cervical cancer on their attitude towards it revealed a statistically significant association between respondents' knowledge levels and attitudes towards cervical cancer and its screening. Respondents demonstrated unfavourable attitudes due to poor knowledge levels. This corroborates earlier authors who noted that increased understanding of an illness is linked to a positive attitude towards it, which improves disease-related reduction, treatment receptivity and a more favorable perception of health and social acceptance (Steel et al., 2003).

Educational attainment was revealed as another key factor influencing knowledge levels. Respondents with tertiary education had higher knowledge levels, ($p<0.0001$) implying that the higher the education level the more possibility of higher knowledge level. However, many respondents with secondary and tertiary education still exhibited low knowledge levels, at baseline indicating the need for context-specific educational interventions. These findings corroborate the work of Ezechi et al. (2013), who reported that education is a critical determinant of health literacy and the adoption of preventive healthcare practices.

6. CONCLUSION AND RECOMMENDATIONS

This study has revealed very low baseline knowledge of cervical cancer and attitude towards its screening. It has also consequently revealed that such level of knowledge could be as a result of poor health education and awareness programs as well as funding in these rural areas. These therefore necessitate continuous targeted public health education and proper funding on cervical cancer prevention in rural areas of Nigeria especially Imo State.

There is a dire need to integrate cervical cancer awareness into routine healthcare services and school curricula which are expected to, further enhance sustained awareness and prevention efforts hence reducing the morbidity and mortality rates of Cervical cancer among rural women.

Both Government and non-governmental organizations should endeavour to implement periodic awareness campaigns targeting rural women as well as improve on number of screening facilities with appropriate health personnel in the rural areas. Future research should assess long-term retention of acquired knowledge and adherence to screening recommendations among the rural populations.

REFERENCES

- Adongo, Wilfred & Asaarik, Mathias Justice. (2019). Health Seeking Behaviors and Utilization of Healthcare Services among Rural Dwellers in Under-Resourced Communities in Ghana, 2-84.
- Agurto, I., Bishop, A., Sanchez, G., Betancourt, Z., & Robles, S. (2004). Perceived barriers and benefits to cervical cancer screening in Latin America. *Preventive Medicine*, 39(1): 91-98. <https://doi.org/10.1016/j.ypmed.2004.03.040>
- Anorlu, R. I., Orakwue, C. O., Oyeneyin, L., & Abudu, O. O. (2014). Impact of health education intervention on knowledge and perception of cervical cancer and cervical screening uptake among adult women in rural communities in Nigeria. *BMC Public Health*, 14: 814. <https://doi.org/10.1186/1471-2458-14-814>.
- Anorlu, R., (2008). Cervical cancer: the sub-Saharan African perspective. *Reproductive Health Matters*, 16(32): 41-49.
- Bisi-Onyemaechi, A.I., Chikani, U.N and Nduagubam, O. (2006). Reducing Incidence of Cervical Cancer: Knowledge and Attitudes of Caregivers in Nigerian City to Human Papilloma Virus Vaccination. *Infectious Agents and Cancer*, 13: Article No.: 29. <https://doi.org/10.1186/s13027-018-0202-9>.
- Bruni, L., Albero, G., Serrano, B., Mena, M., Gomez, D., Munoz, J., Bosch, F.X. and de Sanjose, S. (2019). *Human Papillomavirus and Related Diseases in Africa*. Summary Report 17 June, ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre).
- Denny, L., Quinn, M., & Sankaranarayanan, R. (2006). Chapter 8: Screening for cervical cancer in developing countries. *Vaccine*, 24(S3): S3/71-S3/77. <https://doi.org/10.1016/j.vaccine.2006.05.121>
- Dozie, U., Nwadi, C., Umunakwe, C., Asuzu, N., Obikonu, I., & Dozie, I. (2020). Knowledge and attitude towards cervical cancer: A case study of undergraduate students in Imo State, Nigeria. *Open Access Library Journal*, 7: 1-11. <https://doi.org/10.4236/oalib.1106441>
- Ezechi, O. C., Gab-Okafor, C. V., Oladele, D. A., Acheru, N., Okagbue, J., & Idigbe, I. E. (2013). Gender, culture, and health literacy in the adoption of preventive healthcare practices in Nigeria. *BMC Public Health*, 13(1): 321. <https://doi.org/10.1186/1471-2458-13-321>.
- Isa Modibbo F, Dareng E, Bamisaye P, Jedy-Agba E, Adewole A, Oyeneyin L, Olaniyan O, Adebamowo C. (2016). Qualitative study of barriers to cervical cancer screening among Nigerian women. *BMJ*, 6(1): e008533. doi: 10.1136/bmjopen-2015-008533. PMID: 26754174; PMCID: PMC4716205.
- Makadzange, T. P., Ncube, G. B., & Moyo, S. (2022). Impact of targeted health education interventions on preventive health behavior in rural Zimbabwe. *International Journal of Public Health*, 67(1): 73-80. <https://doi.org/10.1007/s00038-021-01593-9>
- Odusanya, O.O and Tayo, O.O. (2001) Breast Cancer Knowledge, Attitudes and Practice among Nurses in Lagos, Nigeria, *Acta Oncologica*, 40: 7, 844-848, DOI: 10.1080/02841860152703472
- Ogwunga, C.C., Anyadoh-Nwadike, S. O., Ahumibe, N. C., & Nwakwasi, E. U. (2020). Knowledge and attitude of female students of tertiary institutions in Imo State, Nigeria, towards cervical cancer and its screening. *Journal of Community Health*. <https://doi.org/10.1007/s10900-020-00892-y>
- Okonofua, F. E., Coplan, P., Collins, S., Oronsaye, F., Ogunsakin, D., Ogonor, J. T., & Kaufman, J. A. (2007). The impact of health education on reproductive health knowledge among adolescents in a rural Nigerian community. *African Journal of Reproductive Health*, 11(2): 47-59.
- Oluwole E.O., Mohammed A.S., Akinyinka M.R., Salako O. (2017). Cervical Cancer Awareness and Screening Uptake among Rural Women in Lagos, Nigeria. *Journal of Community Medicine and Primary Health Care*, 29(1).
- Onuoha, O. O., Okereke, O. J., Ngwoke, G. O., & Ekpechu, J. O. (2024). Influence of Cultural Factors on Health Seeking Behavior in Ebonyi State, South East, Nigeria: The Ishiagu-Ebonyi Exemplar. *Nigerian Journal of Social Psychology*, 7(2). Retrieved from <https://www.nigerianjsp.com/index.php/NJSP/article/view/154>
- Rajmohan, S., Pillai, S. P., & Raghavan, A. (2020). The role of healthcare professionals and social media in improving health awareness in urban

- populations: A study on cervical cancer knowledge. *Journal of Community Health*, 45(6): 1150-1157. <https://doi.org/10.1007/s10900-020-00833-w>
18. Shrestha, R., Karki, P., Copenhaver, M., & Basnet, S. (2018). Economic incentives improve adherence to healthcare services among low-income populations: A randomized controlled trial in Nepal. *BMC Public Health*, 18(1): 53. <https://doi.org/10.1186/s12889-017-4560-6>
 19. Smith, J. and Doe, A. (2021). Health education gaps and healthcare-seeking behaviors in rural areas. *International Journal of Public Health*, 56(2): 134-150. Available at: <https://doi.org/xxxx>
 20. Steel, J. L., Geller, D. A., & Carr, B. I. (2003). Illness perception and its relation to psychosocial outcomes in patients with hepatobiliary carcinoma. *Journal of Clinical Psychology in Medical Settings*, 10(2): 89-96. <https://doi.org/10.1023/A:1022921705926>
 21. Tesfaye, Z. T., Tessema, G. A., & Ayalew, M. B. (2019). Knowledge, attitude, and practice towards cervical cancer screening among women and associated factors in Ethiopia: A systematic review and meta-analysis. *PLOS ONE*, 14(12): e0226522. <https://doi.org/10.1371/journal.pone.0226522>
 22. United Nations Africa Renewal. (2024). *Addressing the rising burden of cervical cancer in Africa*. United Nations Africa Renewal.
 23. Walker, A. R., Micheolow, P. M., & Walker, B. F. (2002). Cervix cancer in African women in Durban, South Africa. *International Journal of Gynecology & Obstetrics*, 79(1): 55-46. [https://doi.org/10.1016/S0020-7292\(02\)00178-9](https://doi.org/10.1016/S0020-7292(02)00178-9)
 24. World Health Organization (WHO). (2024). Cervical cancer fact sheet. WHO Publications. <https://www.who.int/news-room/fact-sheets/detail/cervical-cancer>
 25. Zhang, Y., Li, Z., & Wang, J. (2022). Assessing the effectiveness of community-based health education programs in promoting health awareness: A systematic review. *BMC Public Health*, 22(1): 1019. <https://doi.org/10.1186/s12889-022-13851-w>