Non comunicable diseases

Factors Affecting Pap Smear Screening Among Women of Reproductive Age in Owerri West LGA, Imo State, South-Eastern Nigeria

UGONMA WINNIE DOZIE[1], NDUKA FAVOUR CHISOM[1], MAUREEN AMAOGE NWOKORIE[2], KELECHUKWU CELESTINE NOSIKE DOZIE[3], CHIDOZIE JOAKIN NWAOKORO[1], UCHECHUKWU M. CHUKWUOCHA[1], UZOCHUKWU GODSWILL EKELEME[1], CHIMEZIE CHRISTIAN IWUALA[1], CHRISTOPHER CHIKE OKEREKE[1], IHEOMA MARIAGORATHY DIALA[1], CLARA OGECHI RAPHAEL[1], IKECHUKWU NOSIKE SIMPLICIUS DOZIE[1]
[1] Department of Public Health, Federal University of Technology Owerri, Imo State, Nigeria;
[2] Department of Community Medicine, University of Nigeria, Enugu Campus, Enugu, Nigeria;
[3] Department of Statistics, Imo State University, Owerri, Owerri, Imo State, Nigeria

Keywords

Cervical cancer • HPV vaccine • Pap Smear • Screening uptake

Summary

Introduction. *Cervical cancer remains a significant public health issue and is the second leading cause of cancer-related mortality among women globally. Its burden extends beyond individual health, affecting families, communities, and social systems. This study aimed to identify the factors influencing Pap smear testing among women of reproductive age in Owerri West, Imo State.*
Methods. *This study adopted a descriptive cross-sectional design using 399 respondents selected through a multistage sampling method. Data were collected using a structured questionnaire and analysed with the Statistical Package for the Social Sciences (SPSS), with results presented in frequencies and percentages.*
Results. *Most respondents were married (51.6%), aged 20-29 years (42.9%), predominantly traders (34.6%) and civil servants (34.9%), of Igbo ethnicity (78.0%), and had tertiary education (48.4%). While 44.8% had heard of cervical cancer, they were not familiar with its details. About 59.0% had heard of Pap smear testing, with nearly half (49.3%) receiving the information from healthcare professionals. Despite a relatively high level of awareness, 61.8% had never undergone a Pap smear. Respondents identified several barriers to Pap smear testing, including the belief that the procedure is expensive or embarrassing. Some also associated undergoing the test before sexual activity with a loss of virginity, while others cited the distant location of screening centres as a significant challenge.*
Conclusion. *There is a critical need for increased medical education and public sensitization on cervical cancer and the importance of routine screening to improve uptake and early detection.*

Introduction

Cervical cancer is a major public health concern and one of the leading causes of cancer related deaths among women worldwide. Globally, it ranks as the third most common cause of cancer mortality in women. It is the most frequently diagnosed cancer in 28 countries and the leading cause of cancer deaths in 42 countries most of which are in sub-Saharan Africa and Southeast Asia [1]. In Nigeria, it is a leading cause of cancer related deaths among women. Despite the availability of effective screening methods such as Pap smear testing, uptake of these services remains low. Its epidemiology and health impacts are not only affecting women, but also their families, communities and social institutions [2]. Although cervical cancer is one of the most preventable and treatable forms of cancer, effective prevention relies on HPV vaccination, early detection, and timely management at the early stages. Cervical screening can be properly utilized if awareness is made and the screening services available. Early screening is proven to be cost-effective and a form of control strategy of the disease burden [3]. The aim of cancer screening is to reduce death from the disease. When pre-cancer lesions are detected and remedied, the incidence of cancer cervix decreases [4, 5]. The three cervical cancer screening tests include cervical cytology (Pap smear or Pap test), primary HPV testing and co-testing (HPV testing in combination with cytology) [6]. Regular cervical cancer screening with Papanicolaou (Pap) smear testing has remained an effective public health intervention in the prevention and subsequent reduction of the incidence, morbidity and mortality of cervical cancer disease [7].

Previous research has shown that various factors influence the decision of women to undergo Pap smear testing. Socio-demographic factors, including age, education level, income, and marital status, have been found to be associated with Pap smear utilization [8, 9]. Younger women and those with higher educational attainment and income tend to be more likely to seek cervical cancer screening services. On the other hand, women with lower educational levels and income might face barriers related to awareness and accessibility [10-13]. Cultural beliefs and misconceptions about the Pap smear procedure have been identified as significant

barriers to screening uptake among women in Nigeria: these include religious modesty requirements, need for spousal consent, preference for female healthcare providers, and traditional beliefs about disease causation [14, 15]. In addition to cultural factors, emotional and psychological factors also play a crucial role in influencing women's attitudes towards Pap smear testing [16, 11]. Embarrassment, anxiety, and fear of pain during the procedure have been reported as barriers to screening uptake [17]. Addressing these emotional aspects is essential to creating a supportive and comfortable environment for women during the screening process.

Furthermore, healthcare system-related barriers have been identified as important determinants of Pap smear testing uptake. Access to healthcare facilities and the availability of screening services can significantly impact women's willingness to undergo screening [18]. Limited access to healthcare facilities, particularly in rural areas, may hinder women from accessing screening services, leading to missed opportunities for early detection and prevention of cervical cancer.

Additionally, negative or dismissive attitudes from healthcare providers towards screening can discourage women from seeking cervical cancer screening services. The attitudes and knowledge of healthcare providers also influence women's participation in screening programs. A lack of awareness or inadequate training among healthcare providers on cervical cancer prevention and screening may result in missed opportunities for education and promotion of Pap smear testing [19]. The study aimed to explore and analyse how different factors affect Pap smear testing among women of reproductive age in Owerri West, Imo State, Nigeria.

Methods

Study Design

This community-based descriptive cross-sectional study used a survey approach to examine the factors affecting Pap smear testing among women of reproductive age in Owerri West LGA, Imo State.

Study Population

This study on the factors affecting Pap smear testing among women of reproductive age was targeted at women of reproductive age (21-49).

Inclusion Criteria

The study included all females aged 21 to 49 years who provided informed consent and were present at the study location during the period of data collection.

Exclusion Criteria

The study excluded males, females below 21 years or above 49 years of age, and individuals who did not provide informed consent.

Sample size

The sample size was determined using Taro-Yamane's formula n=N/(1 + N(e)2 with 95% confidence level.
Where:
n = the sample size
N = the population of the study
e = the margin error in the calculation Substituting the values,
we have; n = 43977/1 + 43977(0.0025) n = 399
The total population of reproductive women N in Owerri west during this study was 43977 which suggested a sample size of 399 participants at 5% minimal error (e).

Sampling method

A multistage simple random sampling method was used in selecting the community in the study. Since the communities are of similar characteristics, fifteen communities in the LGA were enlisted on different ballot papers and five of the ballot papers were randomly selected. The selected ones were used to represent the LGA.

Stage 1: *selection of communities*
Simple random sampling technique was used to select four communities from the fifteen communities in Owerri-West Local Government Area of Imo State. This was done via balloting to give each community an equal chance of being selected.

Stage 2: *selection of villages*
This was done through balloting, one village from each of the communities were selected.

Stage 3: *selection of respondents*
In each village, respondents were recruited via simple random sampling technique so that each member of the population has an equal chance of being selected for the sample, and the selection was made completely at random.

Ethical approval and consent

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. The research protocol was reviewed and approved by Federal University of Technology Owerri Ethics Committee and all participants provided informed consent prior to their participation.

Data collection

A pretested questionnaire was used to collect the data and the questionnaire was administered to the literate study participants in the community while the non-literate were asked orally after getting an informed consent. The questionnaire addressed socio-demographic data, knowledge of cervical cancer, knowledge of Pap smear test, the accessibility of Pap smear testing and belief and attitudes of Pap smear testing, then the participants was provided verbally with basic information on cervical cancer and reasons why they should go for Pap smear testing and be questioned verbally on their beliefs on Pap smear testing.

Data Analysis

IBM Statistical Product and Service Solutions

(SPSS) version 25 was used to analyse the data that were produced. The statistical tools employed in the analysis were mean score, and percentage.

Results

A total of 399 questionnaires were distributed and 364 questionnaires were retrieved back and analysed giving a total response rate of 91.9 %.

According to Table I, majority (42,9%) were aged between 21-29 years. More than half of the respondents were married (51.6%), while 34.9% were civil servants. Nearly half (48.4%) had attained tertiary education, and 37.4% had between three to five children.

Tab. I. Socio-demographic Information of Respondents.

Characteristic	Frequency	%
Age (in years):		
21– 29	156	42.9
30 – 39	119	32.7
40 – 49	92	25.3
Total	364	100
Religion:		
Christianity	321	88.2
Islam	34	9.3
Traditional	9	2.5
Others	00	00
Total	364	100
Marital Status:		
Single	157	43.1
Married	188	51.6
Divorced	7	1.9
Widowed	12	3.3
Total	364	100
Occupation:		
Civil servant	127	34.9
Trader	126	34.6
Farmer	41	11.3
Others	70	19.2
Total	364	100
Ethnic Group:		
Yoruba	34	9.3
Hausa	19	5.2
Igbo	284	78.0
Others	27	7.4
Total	364	100
Level of Education:		
No formal education	16	4.4
Primary	68	18.7
Secondary	104	28.6
Tertiary	176	48.4
Total	364	100
Number of children:		
None	73	20.1
1-2	93	25.5
3-5	156	37.4
Above 5	42	11.5
Total	364	100

Table II, indicated that (41.8%) of the respondents reported being aware of what the HPV vaccine is. More than half (57.7%) indicated that the recommended age to begin cervical cancer screening is between 21 and 29 years. A majority (51.6%) knew that cervical cancer can be prevented or detected early through regular screening. Regarding risk factors for HPV, 35.2% identified having multiple sexual partners. Unusual vaginal bleeding was the most commonly identified symptom of cervical cancer (53.0%). The HPV test was the most recognized cervical cancer screening method, mentioned by 45.9% of respondents.

Table III, indicated that 31,3% reported that they were likely to have heard about Pap smear testing. Among those who had heard about it, the most common source of information was from a nurse/doctor (49.3%). In terms of knowledge, the majority (35.4%) were moderately knowledgeable about what a Pap smear is. Regarding uptake, the highest proportion (46.4%) had not undergone the test but were planning to. On frequency, the majority (36.8%) believed the test should be done every 2-3 years. Finally, the most common reason for undergoing the test, as reported by 34.6% of respondents, was to find precancerous cells.

Table IV, showed that 46.4% of respondents had neither visited nor were aware of any nearby Pap smear facility, while 23.1% had visited once. About 37.6% reported the facility was far from their residence, and 28.8% rated availability as poor. The main barrier to access was limited healthcare infrastructure (34.1%), followed by time constraints (26.6%).

Table V, showed respondents' attitudes towards Pap smear testing. While 31.6% were neutral about its importance, 25.0% agreed that it is important for women's health. On their comfort level with undergoing the test, only 23.1% said they were comfortable, while 28.0% agreed that Pap smear testing can help prevent cervical cancer.

Table VI, revealed that many respondents held misconceptions about Pap smears. About 44% strongly believed they're only needed if sexually active. Around 32% found them expensive, and 31% wrongly believed the HPV vaccine replaces the need for testing. While 36% strongly disagreed that Pap smears mean you have cancer, 32% also disagreed that the test is painful. These results highlight key gaps in knowledge and concerns about cost.

Discussion

This study assessed factors influencing the uptake of Pap smear testing among women of reproductive age in Owerri West Local Government Area, Imo State. The findings revealed moderate awareness of cervical cancer and Pap smear testing; however, actual screening uptake remained low. This highlights a persistent gap between knowledge and preventive health behaviour, a pattern widely reported in cervical cancer literature across low- and middle-income countries. The majority of respondents were aged

Tab. II. Respondents' Knowledge on Cervical Cancer.

Variable	Frequency	%
Have you heard about the HPV (Human Papilloma Virus) vaccine? Yes, I am aware of what HPV vaccine is	152	41.8
No, I have never heard of HPV vaccine before	37	10.2
I have heard of HPV vaccine, but I am not familiar with the details	149	40.9
I am not sure what HPV vaccine is	17	4.7
I would prefer not to answer	9	2.5
Total	364	100
Do you know that HPV infection is a major cause of cervical cancer? Yes, I am aware that HPV infection is a major cause of cervical cancer	197	54.1
No, I did not know that HPV infection is a major cause of cervical cancer	29	8.0
I have heard about the link between HPV infection and cervical cancer, but I am not familiar with the details	81	22.3
I am not sure about the relationship between HPV infection and cervical cancer	57	15.7
I would Prefer not to answer	00	00
Total	364	100
What is the recommended age to start cervical cancer screening? Before 21 years old	43	11.8
Between 21 and 29 years old	210	57.7
Between 30 and 39 years old	67	18.4
40 years old or older	29	8.0
I don't know	15	4.1
Total	364	100
Do you know that cervical cancer can be prevented or detected early through regular screening?		
Yes	188	51.6
No	67	18.4
Not sure	109	29.9
Total	364	100
Which of the following increases the risk of developing HPV?		
Early puberty	83	22.8
Multiple sexual partners	128	35.2
Early sexual activity	39	10.7
Failure to use condom	114	31.3
Not exercising	00	00
Total	364	100
Which of the following are symptoms of cervical cancer?		
Unusual vaginal bleeding	193	53.0
Pelvic pain	141	38.7
Headache	16	4.4
Nausea	9	2.5
Dizziness	5	1.4
Total	364	100
Which of the following are types of cervical cancer screening?		
HPV test	167	45.9
Pap smear test	126	34.6
Gold test	14	3.8
Co-test	49	13.5
RDT	8	2.2
Total	364	100

21-29 years, consistent with findings from other Nigerian studies conducted among women of reproductive age [20, 21]. This age group is often considered sexually active, economically productive, and more exposed to health information. Despite this, screening uptake among younger women remains low. Similar observations have been reported in different studies, where younger women perceived themselves as being at low risk for cervical cancer and therefore delayed screening until symptoms appeared [11, 22]. This perception of invulnerability may contribute significantly to poor preventive health-seeking behaviour.

Although 44.8% of respondents had heard of cervical cancer, many lacked detailed knowledge. This was

Tab. III. Respondents' Knowledge of Pap Smear Testing.

Variable	Frequency	%
Source of information about Pap smear **(n = 215);** From a friend	17	7.9
From family members	11	5.1
From nurse/doctor	106	49.3
From School	43	20
From TV/radio/ social media	38	17.7
Total	215	100
Do you know what a Pap smear test is? Very knowledgeable	93	25.5
Moderately knowledgeable	129	35.4
Somewhat knowledgeable	69	19.0
Slightly knowledgeable	48	13.2
Not knowledgeable at all	25	6.9
Total	364	100
Have you ever undergone a Pap smear test? Yes, multiple times	55	15.1
Yes, once	84	23.1
No, but planning to	169	46.4
No, and not planning to	56	15.4
Not applicable	00	00
Total	364	100
Who should undergo a Pap smear test? People with age > 49	64	17.6
Married woman	97	26.6
I don't know	76	20.9
Children	24	6.6
People > 21 < 49	103	28.3
Total	364	100
How often do you think Pap smear testing should be done?		
Annually	63	17.3
Every 2-3 years	134	36.8
Every 3-5 years	81	22.3
Only when there are symptoms or risk factors	67	18.4
Not sure	19	5.2
Total	364	100
Why should Pap smear testing be done?		
Finds cancerous cells	108	29.7
It helps detect pregnancy	11	3.0
Finds precancerous cells	126	34.6
Finds inflammation	67	18.4
I don't know	44	12.1
Total	364	100

Tab. IV. Level of Accessibility to Pap Smear Testing Facilities.

Variable	Frequency	%
How far is the nearest Pap smear testing facility from your residence? Very close	46	12.6
Close	61	16.8
Moderate distance	38	10.4
Far	137	37.6
Very far	82	22.5
Total	364	100
How would you rate the availability of Pap smear testing facilities in your area? Excellent	49	12.6
Good	67	18.4
Average	96	26.4
Poor	105	28.8
Very poor	47	12.9
Not applicable	00	00
Total	364	100
Are you aware of any barriers that may hinder women's access to Pap smear testing facilities? Time constraints	97	26.6
Unreliable road conditions	48	13.2
Limited healthcare infrastructure	124	34.1
High Transportation Costs	71	19.5
Others	24	6.6
Total	364	100
Have you ever faced any difficulties in scheduling an appointment for a Pap smear test? Strongly Agree	79	21.7
Agree	113	31.0
Neutral	62	17.0
Disagree	81	22.2
Strongly Disagree	29	8.0
Not applicable	00	00
Total	364	100

in contrast with a study carried out in Imo and Enugu state Nigeria where most of the respondents had heard about cervical cancer screening and know where it can be conducted [20, 23]. However, this awareness level is substantially higher than the 12.8% documented among women in urban slums in Lagos [13], reflecting the influence of socioeconomic factors and educational attainment on cervical cancer knowledge [11].

In addition, only 41.8% of respondents were familiar with the HPV vaccine, consistent with other Nigerian studies reporting similarly low HPV vaccine awareness [13, 24] While 57.7% knew that the recommended age for cervical cancer screening is between 21 and 29 years, and 51.6% understood that regular screening helps early detection and prevention, this knowledge did not translate into action. This knowledge-practice gap has been consistently documented across Nigerian studies [11, 21]. Although some respondents could identify symptoms such as unusual vaginal bleeding and pelvic pain (53.0%), the ability to recognize symptoms does

Tab. V. Respondents' Attitudes Towards Pap Smear Testing.

Variable	Frequency	%
Do you think Pap smear testing is important for women's health?		
Strongly Agree	82	22.5
Agree	91	25.0
Neutral	115	31.6
Disagree	41	11.3
Strongly Disagree	35	9.6
Total	364	100
How likely are you to recommend Pap smear testing to other women?		
Very Unlikely	39	10.7
Unlikely	43	11.8
Neutral	118	32.4
Likely	91	25.0
Very Likely	73	20.1
Total	364	100
What are your feelings about undergoing a Pap smear test?		
Very comfortable	71	19.5
Comfortable	84	23.1
Neutral	121	33.2
Uncomfortable	53	14.6
Very uncomfortable	35	9.6
Total	364	100
Have you ever felt uncomfortable or embarrassed during a Pap smear test?		
Very Unlikely	37	10.2
Unlikely	57	15.7
Neutral	94	25.8
Likely	53	14.6
Very Likely	59	16.2
Not Applicable	64	17.6
Total	364	100
Do you believe Pap smear testing can help prevent cervical cancer?		
Strongly Agree	84	23.1
Agree	102	28.0
Neutral	88	24.2
Disagree	55	15.1
Strongly Disagree	35	9.6
Total	364	100

not significantly impact screening behavior as cervical cancer is often asymptomatic in early stages [25]. Majority (45.9%) of the respondents identified HPV test as a type of cervical cancer screening, this aligns with the findings of Dozie et al. [20], where knowledge of Pap smear testing was reported at 53.9%. This was also in tandem with studies by Nthiga [26] and Owoeye & Ibrahim [27], which found knowledge level of pap smear at 75% and 56.2%, respectively.

Healthcare professionals were the primary source of information on Pap smear (49.3%). This finding is consistent with other studies that identified medical practitioners and health workers as the major source of information about cervical cancer and Pap smear [28-30]. However, this contrasts with a study in Enugu, Nigeria, where media was the predominant source of information [23]. This highlighted the influence of medical practitioners on awareness level. This suggests that health workers remain a crucial means for disseminating accurate cervical cancer information, especially in areas where media reach is limited.

Although there was high level of knowledge about pap smear testing among the respondents, a considerable large proportion, (61.8%) had not undergone the test. The low uptake of cervical cancer screening as found in this study is in agreement with the 7.1% reported in Imo State [29]. Other studies among women revealed similarly low screening uptake. A lower rate 1.78% and 13.91% was reported in a study conducted in, Anambra State and Lagos State, respectively [28, 31]. This pattern is consistent across Sub-Saharan Africa, where systematic reviews have documented screening uptake rates typically below 20% despite moderate awareness levels [10]. Notably, even health education interventions have shown limited success in improving uptake without addressing structural barriers. A study among market women in Lagos demonstrated significant knowledge increases post-intervention, yet screening uptake remained unchanged, highlighting that knowledge alone is insufficient without addressing systemic and financial barriers [32].

Key barriers identified included the belief that Pap smears are expensive (61.3%), embarrassing (61.0%), and the challenge of distant screening centres (60.1%). These findings are consistent with those of a study conducted in Kenya, where lack of information (77%) and limited understanding of cervical cancer (85.9%) were reported as major impediments to screening uptake [26]. Similarly, another study highlighted lack of awareness (51.58%) and the unavailability of screening facilities (15.84%) as significant reasons for non-participation in cervical cancer screening programs [28]. The financial barrier is particularly significant in Nigeria's health system where out-of-pocket expenditure dominates, and cervical cancer screening is rarely covered by health insurance [33]. Embarrassment stems from cultural norms around modesty and the intimate nature of pelvic examination. A study has documented that 94% of tertiary students cited embarrassment as a barrier, with fear of the procedure and results representing additional psychosocial barriers [34]. Furthermore, the challenge of distant screening centers reflects critical health system failures, as there is no organized routine screening program in Nigeria, and services are concentrated in tertiary hospitals primarily in urban centers [33, 35]. These findings highlight the importance of raising awareness through targeted health education and making screening services easier to access, in order to overcome both misinformation and practical challenges.

Tab. VI. Respondents' Beliefs Towards Pap Smear Testing.

Beliefs	SA (%)	A (%)	N (%)	D (%)	SD (%)
Only Promiscuous Women Get HPV	77 (21.2)	62 (17.0)	67 (18.4)	93 (25.5)	65 (17.9)
A regular Pap test is enough to protect women against cervical cancer.	43 (11.8)	57 (15.7)	63 (17.7)	92 (25.3)	109 (30.0)
If a woman gets the HPV vaccine, she no longer needs the Pap or HPV test.	73 (20.1)	81 (22.3)	54 (14.8)	113 (31.0)	43 (11.8)
Pap smears are painful and uncomfortable	31 (8.5)	44 (12.1)	58 (15.9%)	116 (31.9)	115 (31.6)
Pap smears are expensive	116 (31.9)	107 (29.4)	54 (14.8)	54 (14.8)	34 (9.3)
Undergoing Pap smear means you have cervical cancer	16 (4.4)	27 (7.4)	83 (22.8)	106 (29.1)	132 (36.3)
Pap smears are only necessary if you're sexually active	159 (43.7)	118 (32.4)	45 (12.4)	24 (6.6)	18 (4.9)
Pap smears are embarrassing	106 (29.1)	116 (31.9)	64 (17.6)	51 (14.0)	27 (7.4)
Pap smears are not necessary after menopause	47 (12.9)	59 (16.2)	38 (10.4)	108 (29.7)	112 (30.8)
A pap smear test is the same thing as an HPV test	54 (14.8)	68 (18.7)	58 (15.9)	106 (29.1)	78 (21.4)
If you get a pap test before having sex, it means you're not a virgin.	86 (23.6)	98 (26.9)	59 (16.2)	67 (18.4)	54 (14.8)
If you get an abnormal result from a pap test, it always means you have cancer.	53 (14.6)	62 (17.0)	73 (20.1)	105 28.8)	71 (19.5)

SA= Strongly agreed, A= Agreed, N= Neutral, D= Disagree, SD= Strongly disagreed

Conclusion

The respondents were aware of cervical cancer and the Pap smear test, but screening uptake remained low due to common misconceptions, such as viewing the procedure as embarrassing or expensive, or believing it is unnecessary after receiving the HPV vaccine. Addressing these barriers requires improved public education, routine integration of cervical cancer screening into healthcare services, and regular training for healthcare providers to ensure they offer supportive, patient-centred care. Awareness programs in schools and universities can also play a vital role in increasing knowledge and encouraging early screening.

Acknowledgement

None.

Funding

No funding was received for this study.

Conflict of Interest Statement

The Authors have declared no conflict of interest relevant to the study.

Availability of data and materials

The materials used in this study will be made available on reasonable request by the corresponding author.

Author's Contributions

UWD conceptualized and supervised the study, designed the questionnaire, participated in the analysis, contributed significantly to drafting and revising the manuscript. NFC participated in data collection and analysis, MAN, UGE, IMD, COR performed literature search and synthesis, KCND participated in the statistical analysis, UMC, CCI, OCC, INSD revisited the manuscript and critically evaluated the intellectual contents, all authors read and signed the final version of paper.

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Received on August 06, 2025. Accepted on January 26, 2026.

Correspondence: Maureen Amaoge Nwokorie, Department of Community Medicine, University of Nigeria, Enugu Campus, 4GPG+57, Obiofu I 402131, Enugu, Nigeria. E-mail: nwokorie.maureen01@gmail.com.

How to cite this article: Dozie UW, Favour Chisom N, Nwokorie MA, Dozie KCN, Nwaokoro CJ, Chukwuocha UM, Ekeleme UG, Iwuala CC, Okereke CC, Diala IM, Raphael CO, Dozie INS. Factors affecting pap smear screening in Owerri West. J Prev Med Hyg 2026;67:E87-E95. https://doi.org/10.82082/2421-4248/jpmh2026.67.1.3704