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Perception and Acceptability of Self-sampling for Human Papillomavirus Among Female Gynecology Clinic Attendees in a Tertiary Hospital in South-West Nigeria

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ABSTRACT

Background & aim: Globally, cervical cancer mortality rates remain alarmingly high, emphasising the significance of HPV as a cause and highlighting disparities in the effectiveness of preventive and corrective measures, particularly in middle-income countries. This study focuses on the perception and acceptability of self-sampling for HPV among female attendees of gynaecology clinics.

Methods: This cross-sectional study was conducted among 256 participants aged 25–65 years who regularly attended gynaecology clinics at a tertiary hospital in South West Nigeria in 2022. Participants were selected via simple random sampling and completed a semi-structured questionnaire on HPV self-sampling. The collected data were analysed using SPSS software version 25, including an examination of associations via Fisher's exact test and logistic regression at a significance level of 0.05.

Results: The participants had an average age of 35.8 ±9.7 years and were almost all literate (98.0%). The mean perception score was 9.4±3.1 (74.2%), with approximately one quarter (25.8%) having a negative perception. The mean acceptability score was 9.2±1.7 (96.5%). Respondents with good HPV knowledge were 5.4 times more likely to have a positive perception than those with poor knowledge (OR = 5.361, p = 0.001, CI: 2.047–14.037).

Conclusion: In this study, many participants had a positive perception, and almost all had a high level of acceptability. Poor perception and inadequate education on self-sampling were related to a low level of acceptability of HPV self-sampling, indicating the need for additional infrastructure and guidelines regarding cervical cancer screening.

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Introduction

Cervical cancer continues to pose a significant health challenge in sub-Saharan Africa, where the incidence and mortality rates remain alarmingly high. These discrepancies highlight the marked difference in the effectiveness of prevention and control measures between high-income nations and their low- and middle-income counterparts in the region (1).

Cervical cancer is a preventable disease, and studies have demonstrated the protective effect of screening. Globally, 69.4% of women diagnosed with cervical cancer are found to have HPV (2). Every year, 14,000 Nigerian women are affected by cervical cancer (3). Although early screening can reduce the prevalence of the disease, overall coverage remains below the ideal level due to financial limitations, an incomplete screening programme and various personal barriers preventing women from seeking screening (4). There is a growing trend towards using HPV testing to determine the most effective cervical cancer screening intervals, particularly among older women. This approach has the potential to enhance screening rates and the

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early detection of cervical cancer, thereby alleviating the global burden of the disease. Using self-collected specimens for HPV testing has been suggested as a way to increase screening participation (5).

The method is highly accurate and acceptable to women in different countries (6). Using HPV testing on self-collected samples demonstrated detection rates of 76% for cervical intraepithelial neoplasia (CIN2) or more severe cases, and 84% for CIN3 or more severe cases (7).

Another study found that, although women were initially surprised to be tasked with self-sampling, they had notably more positive attitudes towards this method than towards clinician sampling. This was particularly evident in their perception of reduced embarrassment and discomfort during self-collection (8). Previous research has indicated that the majority of women are willing to use an HPV self-test at home. However, many of these studies were limited by small sample sizes, restricted geographical scope, or the exclusive collection of qualitative data (9-11). Women's primary concerns often revolved around the accuracy of the test and their ability to obtain a sample correctly. The type of device used appears to be a crucial factor in shaping women's acceptance of self-sampling, with simpler devices resembling basic swabs being preferred (12).

There is a lack of literature on the acceptability of the self-sampling procedure within a population-based setting, where the continuous conduct of cervical cancer awareness programmes could change women's perceptions of cervical cancer screening. Self-sampling shows promise in enhancing the efficacy and acceptability of HPV testing, particularly among women in medically underserved and rural communities, as the majority of those eligible for screening perceive self-sampling to be easier, less unpleasant, less embarrassing and more convenient than physician sampling (13).

Moreover, self-collection has been shown to be as effective as sampling conducted by a healthcare professional in detecting high-risk HPV, which is associated with an increased risk of cervical cancer (11). In survey studies, barriers to cervical cancer screening include scheduling difficulties, time constraints arising from other commitments, unavailability, not being sexually active, a sense of well-being, a relatively low perception of personal risk, embarrassment, concern about pain or discomfort, and a lack of trust in the test (14). Therefore, it is vital to understand women's perceptions of and attitudes towards self-sampling for HPV at a gynaecology clinic in a tertiary hospital in South-West Nigeria.

Materials and Methods

This descriptive cross-sectional study investigated the perception and acceptability of self-sampling for human papillomavirus (HPV) among women attending the gynaecology clinic at a tertiary hospital in South West Nigeria in 2022. The research setting comprised two major hospitals where screening services for cervical cancer were available. The study included women aged 25–65 years who regularly attended gynaecology clinics and were fully informed about cervical cancer screening. Those excluded from participation were women with malignant conditions, women who had undergone a hysterectomy, women unwilling to participate and women attending the clinic solely to accompany others.

The number of respondents was calculated using the Leslie Kish formula with a degree of accuracy of 0.05 and a 95% confidence interval, based on a prevalence rate of 18.4% for cervical cancer screening from a previous study in Lagos State, Nigeria (15). Due to an expected attrition rate of 10%, the sample size was increased to 256. Two major hospitals within the institution were purposively selected and proportional allocation was employed to determine the number of respondents. The final participants were selected through simple random sampling using a balloting method while waiting in the waiting room.

The study was carried out with the aid of a semi-structured interviewer-administered questionnaire with 48 questions. It comprises Section A which was used to document the demographic information about respondents; Section B measured the perception of HPV self-sampling. Perception was measured on 14-point scale where $\leq$7 and >7 was considered negative and positive perception respectively. ; Section C measured the level of acceptability of HPV self-sampling, The level of acceptance was measured on 11-point scale where $\leq$5 and >5 was

considered low and high level of acceptance respectively and Section D was used to seek a response from respondents on the factors influencing the acceptability of HPV self-sampling. The factors influencing the acceptability of human papillomavirus self-sampling was measured with descriptive statistics by running frequency.

The face validity of the questionnaire was assessed by experts in Obstetrics and Gynaecology, as well as Maternal and Child Health. The panel of experts refined the survey questions to ensure they encompassed all relevant factors, including relevance, clarity, simplicity and ambiguity, thereby ensuring content validity. The questionnaire exhibited a content validity index of 0.8. To ensure internal consistency, a reliability test using Cronbach's alpha yielded a value of 0.7.

Data collection spanned two months, following ethical approval from the hospital's review committee. This approval, submitted to each clinic's heads, facilitated the selection of eligible respondents from gynaecology clinics in two hospitals. To safeguard anonymity and confidentiality, the data were anonymised and participants were assigned unique identification codes. The data was stored securely, and only authorised researchers had access.

All completed questionnaires were examined to ensure consistency and completeness of the variables. The questionnaires were manually sorted before the data they contained was entered into the computer. IBM SPSS Statistics version 25 was used for the data analysis. Fisher's exact test, logistic regression, and percentages and mean were used for the data analysis at a significance level of 0.05.

Results

There were 256 participants in the study, and their mean age was 35.8±9.7 years. Half of the respondents (50.0%) fell within the 26 to 35 age group, and a significant majority (82.8%) identified as Christians. A small proportion (2.0%) had no formal education and were unemployed (7.4%). The majority of participants (91.8%) were married. Most of the respondents 212 (83.2%) were in monogamous families and some 61 (29.0%) earned above 50,000 to 100,000 naira (Table 1).

Table 1. Frequency distribution of socio-demographic characteristics of respondents (N=256)

Variable	Frequency (%)
Age group (years)	
25 years	27 (10.5)
26 - 35 years	128 (50.0)
36 - 45 years	62 (24.2)
46 - 55 years	26 (10.2)
56 years and above	13 (5.1)
Religion	
Christianity	212 (82.5)
Islam	44 (17.2)
Highest Level of Education	
No Formal Education	5 (2.0)
Primary	17 (6.6)
Secondary	63 (24.6)
Tertiary	171 (66.8)
Occupation	
Employed	94 (36.7)
Self-employed	77 (30.1)
Trader	29 (11.3)
Student	20 (7.8)
Unemployed	19 (7.4)
Retired	10 (3.9)
Artisan	7 (2.7)
Marital Status	
Single	8 (3.1)
Married	235 (91.8)
Separated	3 (1.2)
Divorced	1 (4)
Widow	9 (3.5)
Type of marriage	
Monogamy	213 (83.2)
Polygamy	43 (16.8)
Monthly Earnings	
50000 and below	51 (24.3)
Above 5000 – 100000	61 (29.2)
Above 100000 – 150000	52 (24.8)
Above 150000	46 (21.9)

The mean perception score of respondents was 9.4±3.1 on a 14-point scale where about one-quarter 25.8% had a negative perception, while many 74.2% had a positive perception (Figure 1).

A portion of the participants expressed that, self-sampling is only necessary if one has a family history of cervical cancer 56 (21.9%) and that HPV self-sampling is only for sexually active women 71 (27.7%). Most 211 (82.4%) disagreed that taking the sample by oneself increases the risk of getting cervical cancer, many respondents172 (67.2%) agreed that it is more comfortable doing self-sampling but half of the respondents 128 (50.0%) disagreed that self-

sampling is less reliable compared to other screening methods.

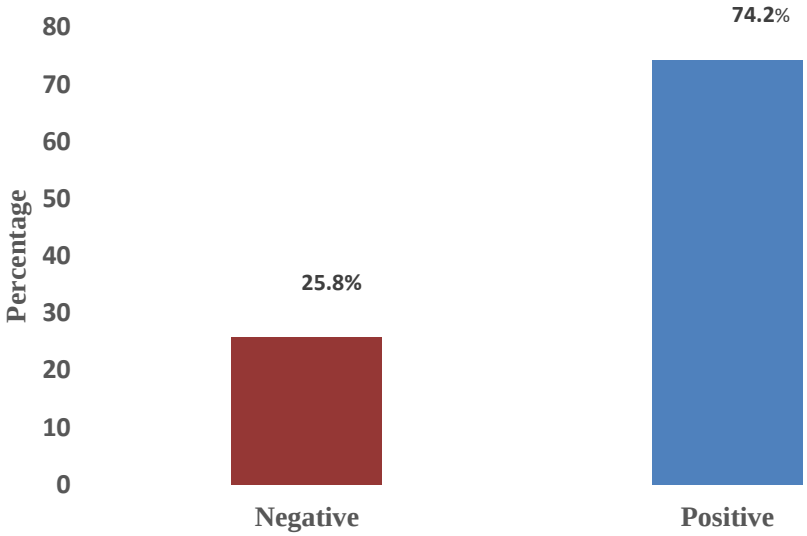

Figure 1. Perception of the respondent on Self-sampling for Human Papillomavirus

A few 42 (16.4%) agreed self-sampling is not that important since they are not having any symptoms, some 35 (13.7%) also agreed it can lead to infertility while some 57 (22.3%) disagreed it is time-consuming. Many of the respondents disagreed sample taking will be painful 146 (57.0%), disagreed the result from the self-taken sample cannot be trusted 152 (59.4%) and many 188 (73.4%) agreed that self-sampling is less embarrassing. Also, many 199 (77.7%) agreed on it helps the in early detection of cervical cancer, more than half of the respondents 139 (54.3%) disagreed it could lead to infection and many 182 (71.1%) disagreed it is wrong to collect the sample by one-self (Table 2).

Table 2. Frequency distribution of responsents' perception on human papillomavirus self-sampling (N=256)

Statements	Agree N (%)	Undecided N (%)	Disagree N (%)
Self-sampling is only necessary if one has a family history of cervical cancer	56 (21.9)	22 (8.6)	178 (69.5)
HPV self-sampling is only for sexually active women	71 (27.7)	14 (5.5)	171 (66.8)
Taking the sample by oneself increases chances of getting cervical cancer	20 (7.8)	25 (9.8)	211 (82.4)
It more comfortable doing self-sampling	172 (67.2)	28 (10.9)	56 (21.9)
Self-sampling is less reliable compare to other screening methods	66 (25.8)	62 (24.2)	128 (50.0)
Self-sampling is not that important since I am not having any symptoms	42 (16.4)	28 (10.9)	186 (72.7)
It can lead to infertility	35 (13.7)	34 (13.3)	187 (73.0)
It is less time consuming	174 (68.0)	25 (9.8)	57 (22.3)
Sample taking will be painful	53 (20.7)	57 (22.3)	146 (57.0)
The result from self-taken sample cannot be trusted	45 (17.6)	59 (23.0)	152 (59.4)
Self-sampling is less embarrassing	188 (73.4)	21 (8.2)	47 (18.4)
It helps in early detection of cervical cancer	199 (77.7)	30 (11.7)	27 (10.5)
Could lead to infection	64 (25.0)	53 (20.7)	139 (54.3)
It is wrong to collect sample by one-self	35 (13.7)	39 (15.2)	182 (71.1)

Table 3. Frequency distribution of acceptability of human papillomavirus self-sampling (N=256)

Variables	Frequency (%)
Willingness to accept self-sampling	
Yes	187 (73.0)
No	69 (27.0)
Feel about collecting your own vaginal swab	
Very bad	18 (7)
Indifferent	19 (7.4)
Very good	219 (85.6)
Ease in collecting this self-sample	
Very hard	29 (11.4)
Indifferent	28 (10.9)
Very easy	199 (77.7)
Convenience of collecting this self-sample (at the clinic or at home)	
Not convenient	36 (14)
Moderately convenient	14 (5.5)
Most convenient	206 (80.4)
Embarrassment collecting this self-sample	
Very embarrassed	21 (8.2)
Embarrassed	14 (5.5)
Not at all embarrassed	221 (86.3)
Discomfort/pain you think you will experience while collecting this self-sample	
Severe discomfort/pain	35 (13.6)
Normal discomfort/pain	37 (14.5)
No discomfort/pain	184 (71.9)
Confident of being able to collect this self-sample correctly	
Not at all confident	73 (28.5)
Moderately confident	15 (5.9)
Very confident	168 (65.7)
Likelihood of choosing HPV self-testing in the future	
Very likely	163 (63.7)
Likely	20 (7.8)
Very unlikely	73 (28.5)
Preference of receiving HPV self-sampling	
Self-sampling with kit delivered at home	75 (23.9)
Self-sampling at home, pick up kit at health clinic	71 (27.7)
Self-sampling at family care provider's clinic	12 (4.7)
Provider-collected sample	98 (38.3)
Willingness to do it regularly as a method of screening	
Yes	206 (80.5)
No	50 (19.5)
Reasons for not willing to do it regularly	
Busy	1 (2.5)
Fear	6 (15)
Husband opposition	2 (5.0)
No child yet	2 (5.0)
Not sick	3 (7.5)
Not susceptible	14 (35.0)
Still young	9 (22.5)
Stressful	3 (7.5)
Recommend HPV self-sampling to a friend or family member	
Yes	229 (89.5)
No	27 (10.5)

The acceptability of HPV self-sampling is influenced by various factors. Among the participanmts, a significant portion 161 (62.9%) expressed concerns about inadequate education on self-sampling. Additionally, more than half 139 (54.3%) conveyed a preference for cervical cancer screening conducted by a healthcare provider rather than opting for self-sampling.

Table 4. Frequency distribution of factors influencing the acceptability of human papillomavirus self-sampling (N=256)

Variable	Frequency (%)
Not enough education on sample sampling	161 (62.9)
Prefer to see a health care provider to get screened for cervical cancer rather than using a self-sample	139 (54.3)
Fear of the unknown related to collecting sample oneself	129 (50.4)
Procedure for effective collection will be too difficult to understand	121 (47.3)
Fear of the positive result	120 (46.9)
Concerns about pain while using a self-sample	107 (41.8)
Fear of hurting oneself when using the self-collection brush	102 (39.8)
I am too young to utilize self-sampling	66 (25.8)
Family/friends oppose it	45 (17.6)
My religion does not support such screening	18 (7.0)

Half of the respondents 129 (50.4%) mentioned fear of the unknown related to collecting the sample oneself, and other factors as reported include a procedure for effective collection will be too difficult to understand 121 (47.3%), fear of the result 120 (46.9%), discomfort during a self-sample 107 (41.8%), fear of hurting oneself when using the self-collection brush 102 (39.8%), being too young to utilize self-sampling 66 (25.8%), family/friends

opposition 45 (17.6%), religion does not support such screening 18 (7.0%) (Table 4).

About half 168(65.7%) had confidence they will be able to collect the self-sample correctly and more than half of the respondents 187(73.0%)said they are very likely to choose HPV self-testing in the future. Only a few 12 (4.7%) said they would like to receive HPV self-sampling at a family care provider's clinic but some 50 (19.5%) would not be willing to do it regularly as a method of screening , still young 9 (22.5%), fear 6 (15.0%) to mention few and majority 229 (89.5%) would be willing to recommend HPV self-sampling to a friend or family member (Table 3).

Logistic regression analysis revealed that respondents with good knowledge on HPV are 5.4 times higher likelihood of having a positive perception compared to those with poor knowledge (OR=5.361, p=0.001, CI: 2.047-14.037). Logistic regression analysis revealed that women with positive perception are 3.8 times more likely to accept HPV self-sampling compared to women with negative perception (OR=3.811, p=0.050, CI: 0.992-14.647) (Table 5).

Table 5. Frequency distribution of Knowelgede and perception of human papillomavirus self-sampling

Variables	Sig.	OR	95% Confidence Interval	
			Lower Bound	Upper Bound
Level of Knowledge				
Poor (Ref)	-	-	-	-
Good	0.001**	5.361	2.047	14.037
Perception				
Negative (Ref)	-	-	-	-
Positive	0.050**	3.811	0.992	14.647

Ref - Reference group

Discussion

This study aimed to assess the perception and acceptability of self-sampling for human papillomavirus (HPV) among female attendees of gynaecology clinics. Many of the respondents had a positive perception of HPV self-sampling, similar to the findings of another study which reported that women had a more positive perception of self-sampling, although this was still below 50% of respondents. This is likely because the respondents had previous experience of cervical cancer screening (16). Many respondents disagreed that sample taking would be painful, as a study reported that there was no pain at all during the procedure, and they perceived the ease of manoeuvring the kit to avoid pain (17). Few agreed that results from self-sampling could not be trusted, which may be due to a lack of knowledge about screening in general, or a lack of trust in self-sampling (11). Many agreed that self-sampling was less embarrassing, as supported by Zhu et al. (11), as it could be done privately. This study was conducted among women in Minnesota. The positive perceptions in this study may be due to nurses providing proper awareness in the facilities.

The majority had a high level of acceptance of human papillomavirus self-sampling, which aligns with previous studies in which most women reported that they were willing to use HPV self-sampling after considering the potential benefits (18-19). Many said they would feel good about collecting their own vaginal swab, in line with a study by Gottschlich et al. (19), due to the convenience of the method. However, there was a significant association between perception and acceptability of HPV self-sampling, showing that a positive perception translates into a higher level of acceptability.

According to this study, women's most common concerns about HPV self-sampling include worries about test accuracy and obtaining an incorrect sample. Many women would prefer to see a healthcare provider for cervical cancer screening rather than taking a self-sample, and some are concerned about pain during the procedure. More than half of the respondents preferred to see a healthcare provider for cervical cancer screening rather than using a self-sample. Similar to the results of another study, they reported that they found the procedure for effective collection too difficult to understand and had concerns about pain while using a self-sample (12). Half of the respondents

mentioned a fear of the unknown related to collecting samples themselves, as well as a fear of the results, which is understandable given that cervical cancer is a deadly disease (20-21).

Also mentioned in this study, as in others, was a fear of hurting themselves when using the self-collection brush (22-23). Some women also said that they were too young to use self-sampling and that their religion did not support such screening, as revealed by Abdullah et al. (16), who conducted a study in Malaysia on the acceptability of HPV self-sampling. These women's concerns may be due to a lack of confidence in their ability despite receiving training on the self-sampling procedure.

In a study by Maza et al., the authors found a significant association between monthly earnings and a positive perception of HPV self-sampling among women. Our study corroborates these findings, demonstrating that the higher a woman's earnings, the more likely she is to have a positive perception of self-sampling. The study revealed that respondents with a positive perception of HPV self-sampling had a high level of acceptability. This was in line with the findings of Fujita et al. (24), who also found high acceptability among women who used self-sampling. Our study shows that women are becoming more aware of their health and taking responsibility for it.

As the study only included patients attending gynaecology clinics at a tertiary healthcare facility, the results cannot be generalised to the general population, including non-attendees and individuals who use primary or secondary healthcare facilities. Despite this limitation, however, the study provides empirical evidence on self-sampling for cervical cancer screening among women that could inform policy.

Conclusion

The results of this study further strengthen the evidence supporting the acceptability of self-sampling as a method, demonstrating its potential to significantly increase the proportion of women undergoing cervical cancer screening in low- and middle-income countries. Many respondents had a positive perception of self-sampling, and almost all had a high level of acceptability. One factor given by respondents with a low level of acceptability of HPV self-sampling was a lack of education on the procedure. The results showed that women with a positive perception were about four times more likely to accept HPV self-sampling. However, the adoption of HPV self-sampling will require additional infrastructure and guidelines. Concerted efforts are crucial to ensure that women of childbearing age have access to pertinent risk information about cervical cancer, enabling them to make fully informed choices regarding cervical screening.

Declarations

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Conflicts of interest

The authors declared no conflicts of interest.

Ethical approval

Throughout the implementation of this study, the utmost attention was given to the ethical considerations associated with review studies. These considerations included maintaining accuracy in the evaluation process, involving all authors in the review process, clarifying the roles of the authors of the studies, protecting the intellectual property of the studies through appropriate citation, and avoiding the manipulation or distortion of data when selecting, excluding or interpreting results from the evaluated articles. Also participants were approached, and informed written consent was obtained after providing a detailed explanation of the study's objectives, procedures, potential risks, and the right to withdraw at any point from all participants.

Code of Ethics

This research is classified as a Original article. The study received ethical approval from the institution's Ethics and Research Committee, identified by the protocol number ERC/2021/08/12.

Use of Artificial Intelligence (AI)

No part of this manuscript was written with the use of any form of Artificial Intelligence

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Authors' contribution

All authors participated in gathering information, searching, and contributing. The initial draft was prepared by the first and second authors (LO/IO), and all authors oversaw it (LO/IO/CN).

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