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Knowledge, Perception and Practice of Human Papillomavirus Testing for Cervical Cancer Screening among Females in a Religious Setting in a Southwestern City, Nigeria

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Abstract

Background: Cervical cancer remains a significant public health issue globally. With the Human Papillomavirus (HPV) being a primary cause and HPV testing an effective method for early detection and prevention of cervical cancer, testing has been reported to be generally low, especially among women in Faith-Based Organisations. **Methods:** The study was a cross-sectional descriptive design. A multistage sampling technique was used to select 200 respondents, and a pretested semi-structured questionnaire was used to collect the data. The data was analysed using descriptive and inferential statistics with the aid of SPSS software version 30, and the results were presented in tables and charts. The level of knowledge was scaled with a score of 0-4 and $\geq$5 for poor and good, respectively, while the Likert scale was used to determine the respondents' perception level. The level of practice was also measured based on whether or not those had done HPV screening. **Results:** The mean age of the respondents was 47.99$\pm$11.3. The majority (52.5%) of the respondents were married; 79.5% had their first menstruation between the age range of 14 and 16, 76.5% had their first sexual intercourse between the age ranges of 20-25, and 55 % had their first marriage between the age ranges of 21-25 (55%). None have a personal history of cervical cancer. The knowledge level of the respondents on HPV testing was relatively low (33.5%); over half of the respondents had negative perceptions (56.5%) about HPV testing, while the majority (77.5%) equally had a poor practice level. **Conclusion and Recommendation:** With a low knowledge level, negative perception, and poor practice of HPV testing among the respondents, the study recommended a comprehensive community outreach among faith-based organisations to include health education and HPV tests for cervical cancer screening.

Keywords: Health issues, Faith Based Organization, HPV testing, cervical cancer, SDG 3

Introduction

Globally, cervical cancer is the fourth most common cancer among women, with approximately 660,000 new cases and 350,000 deaths in 2022 (WHO, 2024). In Africa, approximately 70% of the diagnosed cervical cancer cases lost their lives ultimately due to late diagnosis (Musa, 2016; Mwenda et al., 2017; AHO, 2020; Appiah-Kubi, 2022; WHO, 2024; Yim, 2024). Ultimately, it has been estimated that about 372.2 million females under the age of 15 years are at risk of cervical cancer in Africa, of which 119,284 are diagnosed every year and 81,687 die from the disease (68.5% mortality rate) (Bruni et al., 2019). While mortality rates are decreasing only in high-income countries (Vaccarella et al., 2013; Xu et al., 2023), it remains a leading cause of death among women in developing countries (Zhang, 2020; Yim, 2024; Appiah-Kubi 2022; Hull, 2022); with approximately 80% of deaths from cervical cancer occurring in low- and middle-income countries, Nigeria inclusive (Mafiana et al., 2022; Ola et al., 2023). Over the last decades, trends in cervical cancer incidence and mortality have been observed to vary in different countries across the world (Vaccarella, 2017; Nowakowski,

2017). The highest burden (over 90%) of cervical cancer has been reported in sub-Saharan Africa, leading to death due to limited access to early diagnosis and treatment (Ozaydin-Yavuz et al., 2019; Jedy-Agbe et al., 2020; Sung et al., 2020; WHO, 2022).

In Nigeria, cervical cancer constitutes a major cause of cancer-related morbidity and mortality, accounting for a range of 13-32% of all female cancers across different regions (Ferlay et al., 2020; Kani, 2020; WHO, 2020; Anoruo, 2022; Chidinma, 2022). In specific, regional data varies from 7.2% to 36.9%, with 10-13% in the South-East; 6-18% South-South; 6-8% in Southwest; 13-37% in Northcentral; 10-12% in the North East; 7-14% in Northwest (Studies have shown that there is limited knowledge of this important health preventive and promotive service (Akpo et al., 2016; Omowhara et al., 2021; Akpan et al., 2023). In addition, the low HPV test practice (screening rate) has also been reported in studies (Okunowo et al., 2021; Omowhara et al., 2021).

Conversely, early detection has been recommended as one of the effective preventive measures in which HPV testing stands out with high effectiveness among other forms of screening. Research evidence has supported that cervical cancer screening is more effective when based on HPV DNA tests over a long time (Ronco et al., 2014; Koliopoulos et al., 2017). World Health Organization affirmed that the HPV DNA-based test has proven more effective than other commonly used screening methods in today's practice because they are less prone to quality problems. Hitherto, evidence from clinical trials has also supported the claim that HPV DNA-based tests are more effective than cytology-based tests, especially for low- and middle-income countries (WHO, 2021). Despite this, there is still resistance towards HPV screening uptake among the female population in the country (Ogbolu and Kozlovszky, 2024), as a relatively low number of Nigerian women (12.5%) have ever undergone HPV testing, reflecting substantial gaps in knowledge and access to preventive services (Akinola et al., 2019).

While studies have established the statuses of the key indicators that could promote the practice of HPV testing among women around the world (Tatar et al., 2018; Adeyemi et al., 2021), there is low HPV screening among women in Faith-Based Organisations (FBO) (Isa et al., 2016; Effah et al., 2023). However, the reported evidence supporting the low screening of HPV among women in FBOs is not exhaustive as there is a paucity of data for cervical cancer screening among women attending FBOs despite being a formidable setting for health promotion due to the large population of women that can be captured at once in such a setting. Due to religion-related reasons, Muslim women have been linked to delayed healthcare-seeking behaviour and attributed to poor health outcomes (Sean et al., 2016; Vu et al., 2016; Ali et al., 2021). Hence, the type of health behaviours such people uphold, positive or negative, will continue to have substantial implications for public health. Apart from religiosity playing a significant role in influencing health behaviours, leveraging people's religious beliefs is one of the effective strategies that could be deployed in driving the grassroots towards achieving the Sustainable Development Goals (SDGs). More so, SDG 3 specifically (quality health and well-being) will be almost impossible if religious values and beliefs are not considered (Best et al., 2019). Therefore, for acceptability and uptake of this kind of health behaviour in discourse (HPV testing), the power of religious leaders to change the narrative cannot be over-emphasised as members of religious organisations not only respect their leaders but also place them on a pedestal as change agents. One such FBO is Nasrullahi li-Fathi (NASFAT), whose leadership and organisational structure are well established, and members are dispersed worldwide. However, no singular study on HPV testing for cervical cancer prevention has been conducted among female members despite the vast population of women's lives that can be saved from cervical cancer. In reducing maternal morbidity and mortality as one of the targets of SDG 3, it becomes imperative to conduct such a study among the female members of this notable Islamic Organization. Hence, this study aims to investigate the knowledge, perception and practice of HPV testing among female

members of NASFAT, Ring Road branch, Osogbo, Osun state.

Materials and methods

Study population

This study was conducted among female members of the Nasrul-Lahi-L-Fatih Society (NASFAT), Osogbo, Osun state. With the health unit and over 500 population, the women being the largest, the branch served as a viable and good study site for this current study. Based on the interview conducted with the stakeholders of the organisation, NASFAT has four cardinal agendas of Health, Education, Livelihood and Dawah (HELD), which the Osogbo branch has built upon and increased to seven structures of Health, Education, Livelihood, Dawah, Welfare, Security, and Cooperative.

Study area

This study was conducted among NASFAT female members. It is a Nigerian Islamic organisation founded in 1995 to foster unity among Muslims, promote Islamic knowledge, and encourage religious tolerance. NASFAT focuses on education, social welfare, and community development initiatives. Like the national body, the organisation's vision is to be a pace-setting Islamic organisation with widespread acceptance within and outside Nigeria. The mission of NASFAT is to develop an enlightened Muslim Society nurtured by a proper understanding of Islam for humanity's spiritual uplift and welfare.

Study design

This study was a descriptive cross-sectional study using a mono-method quantitative approach to administer a semi-structured interviewer-administered questionnaire.

Sampling technique

A multistage sampling technique was used to select the study respondents, and it was done in stages as highlighted below:

In Stage 1: The first selection was to purposively select the Ring Road branch of the NASFAT Prayer Group in Osogbo due to their population, which is the highest population among the branches of the NASFAT religious society in Osun state.

In Stage 2: The respondents' selection was made using a random sampling technique, where female members were present on the day of data collection and willing to participate in the study through balloting until the sample size was completed.

Study instrument

A semi-structured questionnaire was pretested at the NASFAT Asalatu, Ede branch, and an overall reliability coefficient of 0.78 was used for the data collection. The questionnaire consisted of four sections labelled A-D. Section A explored the socio-demographic characteristics of the respondents and consisted of 15 question items. The respondents' knowledge of HPV and HPV testing was assessed in section B with seven (7) question items. In section C, eight (8) question items were used to determine the respondents' perception of the HPV test, while the practice of the HPV test was determined with one question in section D.

Sample size

The sample size of this study was determined using the Leslie Kish formula of

$$n = Z^2pq/d^2$$

n – Minimum sample size, Z – Standard normal deviation set at 1.96 Normal p – 8.3% (which is the proportion of faith-based women that have been screened for cervical cancer from a study conducted by Nwagu & Abugu, 2021)

$$p = 0.083;\ q – (1\text{-}p) = 1 – 0.083;$$

d – Level of precision (the proportion of error to accept) = 0.05. Therefore, the sample size,

$$n = \frac{1.962\times0.083(1\text{-}0.083)}{0.052}$$

$$= \frac{3.84\times0.083\times0.917}{0.0025}$$

$$= \frac{0.292}{0.0025}$$

$$N = 116.9$$

10 % non-response, 10 % of 116.9 = 11.69

$$116.9 + 11.69 = 128.59 \approx 129$$

For easy analysis and -tabulation, the sample size was rounded up to 200, and these equal

copies of the questionnaire were administered among the respondents.

Study variables

The dependent variables measured in the study were the knowledge of the HPV test, perception of the HPV, and the practice of the HPV test. The moderating variable was the HPV test, while the independent variable was the socio-demographic characteristics of the respondents. The level of knowledge was scaled with a score of <3 and >3 for poor and good, respectively, while the Likert scale was used to determine the level of perception of the respondents. The level of practice was measured based on those who had done HPV tests or not.

Data collection procedure

The data collection was done between June and July 2024. Two research assistants were recruited based on their qualifications and experience in conducting health surveys. Preference was given to individuals with a public health or social sciences background. A comprehensive training session was conducted for the assistants to familiarise them with the study objectives, data collection techniques, and ethical considerations.

Method of data analysis

The completed copies of the questionnaire were examined for completeness of responses. The completed data were cleaned, entered, coded, and analysed using the Statistical Products for Service Solutions (SPSS) batch system version 30.0. Knowledge about cervical cancer, HPV and HPV testing was measured on a 7-point scale, with scores categorised as good knowledge (<4) and poor (>4) knowledge. Perceptions were measured on a 32-point rating scale and respondents' perception was categorised as unfavourable for a score <16 and positive for a score > 16 on a Likert scale of responses, including "Strongly Agreed, Agreed, Undecided, Disagree, and Strongly Disagreed. The perception statement with a positive tone was scored as SA-4, A-3, U-0, D-2, and SD-1; the reverse for the perception statement with a negative tone. The practice variable having a question item was measured on a Likert scale of "severally, few times, once, and never;" and was categorised as good for a score (>2) and poor for a score (<2) on a 3-point rating scale.

Results

Socio-demographic characteristics of the respondents

Table 1 below shows the socio-demographic characteristics of the respondents. With a mean age of 47.99±11.3, it is not surprising that the majority of the respondents were married (52.5%) who had their first menstrual cycle between the ages of 14 and 16 (79.5%); first sexual intercourse between the ages of 20 and 25 (76.5%), and first marriage between the ages of 21 and 25 (55%) respectively, with no personal history of cervical cancer.

Knowledge of respondents about cervical cancer, HPV, and HPV test

Table 2 revealed the respondents' knowledge of cervical cancer, HPV, and HPV tests. While the majority (96%) of the respondents were aware of cervical cancer, only a few were aware of HPV infection (39%) and HPV test (31.5%), respectively. The majority (58%) could also not link HPV with cervical cancer owing to the low level of awareness. With a mean score of 3.5, a standard error of 0.16 and a standard deviation of 2.32, two-thirds of the respondents (66.5%) were categorised to have a poor level of knowledge of HPV and HPV tests for cervical cancer on a seven (7) point rating scale; this is typified pictorially in Figure 1.

Perception of respondents about cervical cancer, HPV and HPV test

Table 3 above revealed the respondents' perception of HPV and HPV tests. The strongly agreed and agreed responses were collapsed to reflect the respondents who agreed with the statement, while the same was done with the strongly disagreed and disagreed responses. According to the Table, the perceived susceptibility of the respondents to HPV infection (38.5%) and cervical cancer (43%) is low, and this is obvious with half (50.5%) of the respondents' preference for other cervical cancer screening methods. Also, with a mean score of 16.4 on a 32-point rating scale, over half (56.5%) of the respondents were

categorised as having a negative perception of HPV and cervical cancer, as typified in Figure 2.

Table 1: Socio-demographic characteristics of respondents (n = 200)

Variables	Frequency (n)		Percentage (%)	
Age(years)				
25 -39	37		18.5	
40-54	118		59	
55-69	33		16.5	
70-80	12		6	
Mean age = 47.99±11.3years				
Marital Status				
Single	5		2.5	
Married	105		52.5	
Divorced	28		14	
Widow	42		21	
Separated	20		10	
Occupation				
Trader	75		37.5	
Medical Personnel	10		5	
Teacher	35		17.5	
Civil servant	45		22.5	
Retiree	35		17.5	
Level of Education				
No Formal Education	5		2.5	
Primary	12		6	
Secondary	129		64.5	
Tertiary	54		27.5	
Type of marriage				
Monogamy	125		62.5	
Polygyny	70		35	
Not married	5		2.5	
Age at first menstruation				
14-16	159		79.5	
17-19	40		20	
20 and above	1		0.5	
Age at first sexual intercourse				
None	2		1	
17-19	45		22.5	
20-25	153		76.5	
Age at first marriage				
14-20	5		2.5	
21-25	110		55	
26-30	85		42.5	
Monthly Income (Naira)				
Less than 50,000	82		41	
More than 50,000	118		59	
History of Cervical Cancer	Yes	No	0.5	99.50
Personal history	1	199	100	
Immediate Family History	0	200	1	99
Extended Family History	2	198		

Table 2: Knowledge of cervical cancer, HPV, and HPV test

Variable	Frequency (N=200)	Percentages (%)	Mean (SE) ± SD
Have you heard of cervical cancer?			3.5 (0.16) ± 2.32
Yes	192	96	
No	8	4	
Have you ever heard of HPV infection?			
Yes	78	39	
No	122	61	
Have you ever heard of the HPV test?			
Yes	63	31.5	
No	137	68.5	
Can HPV cause cervical cancer?			
Yes	84	42	
No	116	58	
Is cervical cancer preventable?			
Yes	155	77.5	
No	45	22.5	
Can the HPV test be used to determine if one has cervical cancer?			
Yes	69	34.5	
No	131	65.5	
Source of information?			
Social media	13	6.5	
Medical personnel	72	36	
Friends and families	100	50	
Others	15	7.5	
Age when HPV test can be done			
10-18	128	64.5	
40-60	68	34	
25-29	3	1.5	

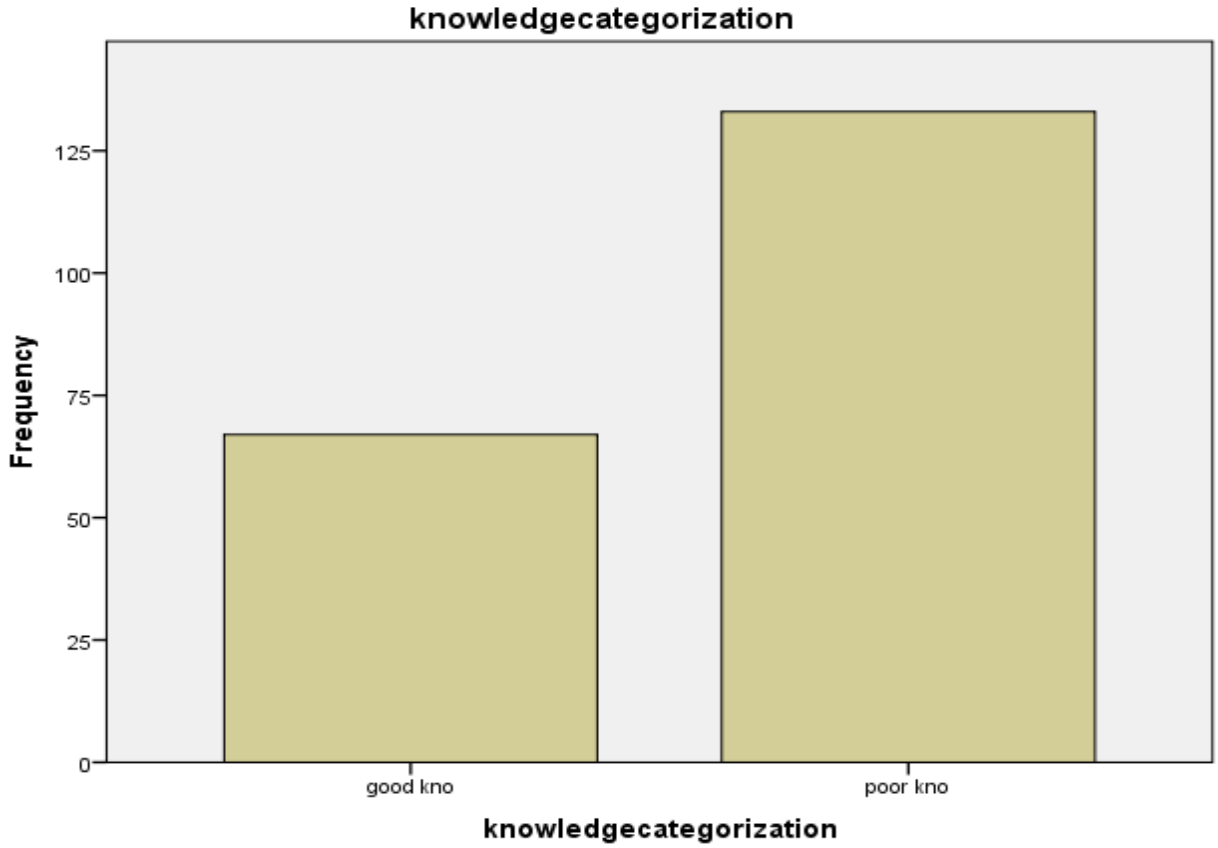

Figure I: A bar chart showing the knowledge categorisation of the respondents

Table 3: Perception about cervical cancer, HPV and HPV test

Perceptional statement	SA	A	U	D	SD	Mean (SE) ± SD
I am at risk of having an HPV infection	50 (25%)	27 (13.5%)	0 (0%)	73 (36.5%)	66 (33%)	16.4 (0.4) ± 5.0
I am at risk of cancer of the cervix	54 (27%)	32 (16%)	1 (0.5%)	63 (31.5%)	50 (25%)	
I prefer having an HPV test to screen for cervical cancer	42 (21%)	27 (13.5%)	13 (6.5%)	90 (45%)	28 (14%)	
I am afraid to do an HPV test	44 (22%)	103 (51.5%)	5 (2.5%)	38 (19.5%)	10 (5%)	
HPV testing can prevent cancer complications if positive	58 (29%)	84 (42%)	34 (17%)	22 (11%)	2 (1%)	
HPV test for cervical cancer is expensive	3 (1.5%)	65 (32.5%)	86 (43%)	42 (21%)	2 (1.5%)	
The self-collection process makes HPV test scary	6 (3%)	69 (34.5%)	83 (41.5%)	39 (19.5%)	3 (1.5%)	
I prefer other cervical screening procedures to the HPV test	24 (12%)	77 (38.5%)	51 (25.5%)	43 (21.5%)	5 (2.5%)	

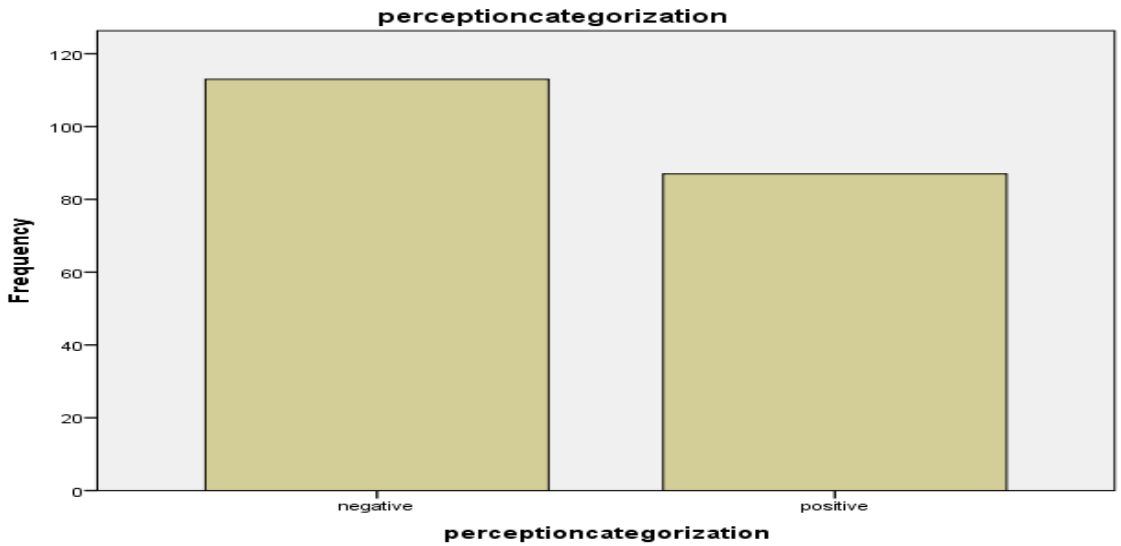

Figure 2: A bar chart showing the perception categorisation of the respondents.

Table 4: Practice of HPV testing for cervical cancer screening

Statement consideration: I've gone for the HPV test for cervical cancer screening	Frequency	Percentage (%)	Mean ± SD
Severally	0	0	0.7±1.23
Few times	3	1.5	
Once	42	21	
Never	155	77.5	

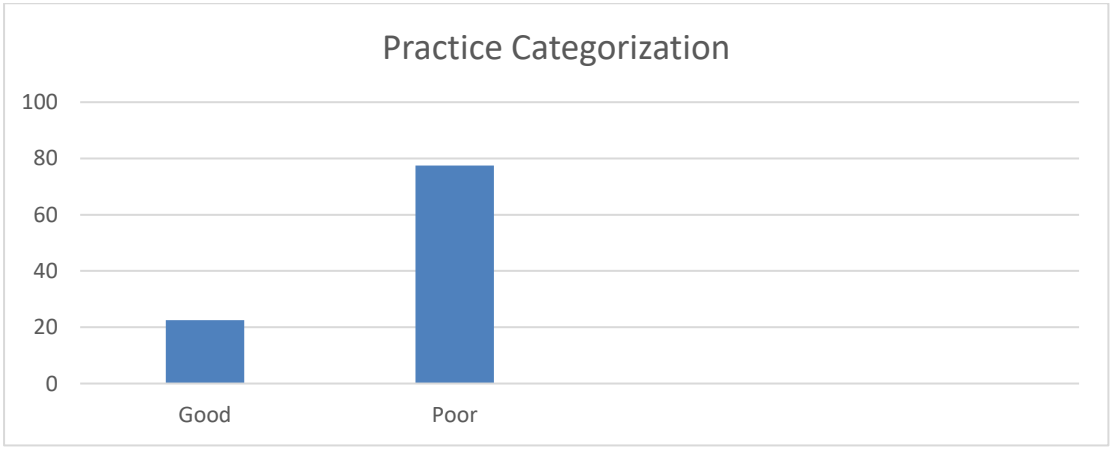

Figure 3: A bar chart showing the respondents' practice level of HPV test

Practices of respondents towards HPV testing for cervical cancer screening

Table 4 revealed the level of practice of HPV tests among the respondents. Most respondents had never gone for HPV screening, which corroborated the mean score of 0.7 on a 3-point rating scale to give over (77.5%) half of the respondents categorised as having poor HPV practice, as depicted in Figure 3.

Discussion

Most of the respondents were aware of cervical cancer, whereas only a few heard of HPV infection and HPV tests. This low awareness level is reflected in their overall knowledge of the relationship between the HPV infection and HPV test with cervical cancer, as well as related questions on HPV tests. The finding of this study is in line with Tarta et al. (2020) and Aga et al. (2020), who equally reported a low level of knowledge of HPV tests among healthcare providers and health professional students expected to be in the front row of advocacy for HPV test to prevent cervical cancer. In addition, Waller et al. (2024) reported a low knowledge level of the HPV test, where only 12.2% of the respondents had adequate knowledge, with a more alarming record of 95.8% of female students who had never heard of the HPV test (Eche et al., 2022). In the study of Akpinar *et al.* (2023) on knowledge and perception regarding HPV, a low awareness level of both HPV (43.6%) and HPV screening test (50.6%) was reported among the respondents. In contrast to this study, Dodd et al. (2014) reported a high awareness of HPV tests but a low knowledge level, with a conclusion of identifying the importance of increasing awareness among men since significant others positively influence women. HPV plays an aetiological role in cervical cancer; this is similar to the findings of Adeyemi et al. (2021) on predictors, barriers and motivating factors for human papillomavirus vaccination and testing as preventive measures for cervical cancer: A study of urban women in Lagos, Nigeria.

With the variation in the knowledge of cervical cancer and HPV testing (Kasting et al., 2017; Tarta et al., 2020), low knowledge level of HPV testing will remain an impediment to its practice and ultimately to the prevention of cervical cancer across the underdeveloped and developing countries like Nigeria.

Over half of the respondents negatively perceived HPV testing in this study. In the hierarchy of indicators leading to behavioural change, ensuring a positive perception about a health behaviour enhances its practice. McRee et al. (2017) opined that positive perceptions enhance screening uptake, knowledge, and accessibility. The outcome of this study is in line with the findings of the qualitative study conducted by León-Maldonado (2016), where a negative perception of emotional distress created a high level of confusion and reluctance towards HPV and HPV testing. With this outcome, the study concluded that there was a need for health education and communication to ameliorate the effect of the negative emotions burdening the respondents. However, McRae et al. (2014) reported that the negative perception of the participants changed during the interview, and a strong attachment to cytology rather than HPV testing was reported among the women involved in their study. The study concluded that efforts should be geared towards sufficient information provision and education to ensure the acceptability and optimum uptake of HPV tests.

Furthermore, most of the respondents' HPV test practice was poor. Quite a significant number had never gone for an HPV test owing to several factors, as the respondents verbally mentioned in the questionnaire. In line with this study's findings, Adeyemi et al. (2021) and Eche et al. (2022) also reported very low uptake of HPV tests of 1% and 3%, respectively. The two studies recommended the need for enlightenment and health education while addressing the identified factors hindering HPV uptake and practices among women.

Conclusion and recommendations

The study preliminarily identified a low level of knowledge, negative perception, and poor practice of HPV testing among females, including the members of NASFAT. To address this gap, a health education intervention to raise awareness and increase respondents' knowledge becomes imperative. In addition, cervical cancer screening outreach using the HPV DNA test and self-collection method is further recommended by this study

to improve the uptake and practice of HPV testing among the study respondents. Leveraging the organisational structure of NASFAT, community participation with the leaders and stakeholders, and collaboration with the health unit of the organisation will also go a long way to continually promote the health of their female members as aimed by this study and prevent them from the alarming rate of morbidity and mortality associated with cervical cancer.

Public health implications of the study

The findings of the study have implications on various health dimensions as follows;

Physical Health Dimension

- Increased risk of cervical cancer: The continuum of behavioural change begins with a change in awareness and knowledge, attitudinal disposition, perception and practice. A low knowledge level and negative perception will translate to poor practice, as revealed in this study. Invariably, a poor practice of HPV screening can result in undiagnosed and untreated cervical cancer cases.
- Complications and mortality: Late diagnosis and treatment will, in turn, result in severe complications, reduced quality of life, and increased mortality. Cervical cancer remains the second most frequent cancer case and death among Nigerian women owing to low knowledge, negative perception, and poor screening practices, among other factors.
- Reproductive health issues: Among other factors, untreated cervical cancer remains one of the causes of reproductive health issues and significant gynaecological disorders among women (infertility, miscarriage, and premature birth) presently (Osei et al., 2021; WHO, 2024).

Mental Health Dimension

- Anxiety and stress: Lack of knowledge and negative perception about HPV screening can lead to increased anxiety and stress levels among women.
- Fear and stigma: Myths and misconceptions associated with HPV and cervical cancer can trigger mental health issues like depression and social isolation. Apart from these, significant psychological distress such as shame, guilt and feelings of hopelessness are also accompanied by the diagnosis of cervical cancer arising from poor practice of HPV screening.

Social Health Dimension

- Economic burden: The financial burden associated with the secondary and tertiary levels of cervical cancer is enormous in developed countries, not to mention developing countries like Nigeria; this affects not only the individual but also their family and the community at large.
- Social stigma and discrimination: women with HPV or cervical cancer may face social stigma, marginalization, and discrimination. In a country like Nigeria, where cultural beliefs of myths and taboos still have a strong hold on community members, this could cause a strain on their social relationships, leading to abandonment and neglect.

Spiritual Health Dimension:

- A diagnosis of HPV and cervical cancer can cause spiritual distress like questionable faith and doubtful belief in the existence of God, decreased/ increased coping mechanisms such as prayer or meditation to handle the emotional and psychological impact of HPV or cervical cancer, most especially among women in a Faith-Based Organization.

Ethical approval

Ethical approval to carry out the study was sought and obtained from the Health Research and Ethics Committee at the Osun State Ministry of Health, Abere, Osogbo, Osun state. The ethical approval with Ref No: OSHREC/PRS/569/604 and letter of introduction from the research department were presented to the medical and research committee through the chairman of NASFAT.

Informed consent

Study participants were informed about the study in detail to seek their consent. No participant was coerced into the study; all information provided was kept confidential and used for the research study alone. The feedback was provided to the same prayer group/ centre where data collection occurred**.**

Limitations to this study

The sample location for this study was relatively small, which may limit the findings' generalizability to the broader population. Also, focusing on a specific religious setting in Osogbo may not capture the diversity of beliefs and practices across different communities.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

Abugu, L.I., & Nwagu, E.N. (2021). Awareness, Knowledge and Screening for cervical cancer among women of a faith-based organisation in Nigeria. *Pan Afr. Med J.*, *14*;39:200. doi: 10.11604/pamj.2021.39.200.23761. PMID: 34603581; PMCID: PMC8464205.

Adeyemi, A., Okunowo, Aloy O., Ugwu, Jubril O., & Kuku, Adaiah P. *et al.* (2021). Predictors, barriers and motivating factors for human papillomavirus vaccination and testing as preventive measures for cervical cancer: A study of urban women in Lagos, Nigeria, *Preventive Medicine Reports, 24*,2021,101643, ISSN 2211-3355.

Aga, S.S., Yasmeen, N., Khan M.A., Hakami, A.Y., Awadh, A., & Malli, I.A. (2022). Knowledge, Attitudes, and Perception toward human papillomavirus among health profession students: A cross-sectional study in King Saud Bin Abdulaziz University for Health Sciences. *J. Educ. Health Promot., 28*(11), 141. doi: 10.4103/jehp.jehp_640_21. PMID: 35677262; PMCID: PMC9170198.

Akinola, J. O., Odukogbe, A. T. A., & Lawal, A. K. (2019). Cervical cancer screening: Awareness and utilisation among women in a local government area in Nigeria. *Journal of Public Health in Africa*, *10*(2), 100-104.

Akpan, M., Ndep, A., Ekpenyong, B., Akpan, I., Akpan, A., Eyam, L., Ella, R., & Ekanem, E. (2023). Cervical cancer screening services targeting adult women in Cross River State, Nigeria. *African Journal of Reproductive Health, 27* (4), 34-42 https://doi.org/10.29063/ajrh2023/v27i4.4.

Anifowoshe, A. T., Owolodun, O. A., Oyinlola, B. O., Abdulganiyu, K., Yusuf, R. D., Oredein, O. A., & Iyiola, O. A. (2018). Incidence of common and rare cancers in Ilorin, Nigeria. *Notulae Scientia Biologicae*, *10*(4), 453-459.

Christopher, O. C., Osagbemiro, B. B., & Akani, N. A. (2019). Cancer incidence in the Niger Delta region of Nigeria; a population-based review of Port Harcourt cancer registry. *The Nigerian Health Journal*, *19*(2), 85-95.

Dodd, R.H., McCaffery, K.J., Marlow, L.A.V. , *et al.* (2014). Knowledge of human papillomavirus (HPV) testing in the USA, the UK and Australia: an international survey *Sexually Transmitted Infections, 2014*(90**),** 201-207.

Eche, M.T., & Vermaak, K. (2022). Knowledge, attitude and practice of female university students regarding human papillomavirus and self-sampling in KwaZulu-Natal, South Africa: a cross-sectional survey. *BMC Womens Health*. *22*(1), 58. doi: 10.1186/s12905-022-01634-z. PMID: 35246111; PMCID: PMC8895517.

Effah, K., Tekpor, E., Amuah, J.E., Essel, N.O.M., & Kemawor, S. (2023). Self-sampling and HPV DNA testing for cervical pre-cancer screening in a cohort of nuns in Ghana: a cross-sectional cohort study. *EClinicalMedicine. 31*(63), 102-183. Doi:

10.1016/j.eclinm.2023.102183. PMID: 37692077; PMCID: PMC10484965.

Ferlay, J., Colombet, M., Soerjomataram, I., Parkin, D.M., Piñeros, M., Znaor, A., & Bray, F. (2021). Cancer statistics for the year 2020: An overview. *Int J Cancer*. doi: 10.1002/ijc.33588.

Haward, B., Tatar, O., Zhu, P., Griffin-Mathieu, G., Perez, S., Shapiro, G.K., McBride, E., Zimet, G.D., & Rosenberger, Z. (2022). Development and validation of the cervical cancer knowledge scale and HPV testing knowledge scale in a sample of Canadian women. *Prev Med Rep*. doi: 10.1016/j.pmedr.2022.102017. PMID: 36281348; PMCID: PMC9587520.

Isa Modibbo, F., Dareng, E., Bamisaye, P., *et al.* (2016). Qualitative study of barriers to cervical cancer screening among Nigerian women. *BMJ Open*, *6*, e008533. Doi: 10.1136/bmjopen-2015-008533.

Kasting, M.L., Wilson, S., Zollinger, T.W., Dixon, B.E., Stupiansky, N.W., Zimet, G.D. (2017). Differences in cervical cancer screening knowledge, practices, and beliefs: An examination of survey responses. *Prev Med Rep.*, *21*(5), 169-174. doi: 10.1016/j.pmedr.2016.12.013. PMID: 28050339; PMCID: PMC5200875.

Koliopoulos, G., Nyaga, V. N., Santesso, N., Bryant, A., Martin-Hirsch, P. P., Mustafa, R. A. (2017). Cytology versus HPV testing for cervical cancer screening in the general population. *Cochrane Database Syst Rev.*, doi: 10.1002/14651858.CD008587.pub2 .

León-Maldonado, L., Wentzell, E., Brown, B., Allen-Leigh, B., Torres-Ibarra, L., Salmerón, J., *et al.* (2016). Perceptions and Experiences of Human Papillomavirus (HPV) Infection and Testing among Low-Income Mexican Women. *PLoS ONE*, *11*(5), e0153367. https://doi.org/10.1371/journal.pone.0153367.

McRae, J., Martin, C., O'Leary, J. *et al.* (2014). "If you can't treat HPV, why test for it?" Women's attitudes to the changing face of cervical cancer prevention: a focus group study. *BMC' 'Women's Health*, *14*, 64. https://doi.org/10.1186/1472-6874-14-64.

Ogbolu, M.O., & Kozlovszky, M. (2024). Assessment of HPV Knowledge and Awareness among Students and Staff at IBB University, Niger State, Nigeria: Implications for Health Education and Prevention. *Healthcare (Basel)*, *12*(6), 665. doi: 10.3390/healthcare12060665. PMID: 38540629; PMCID: PMC10970435.

Omosun, A., Abayomi, A., Ogboye, O., et al. (2022). Distribution of Cancer and Cancer Screening and Treatment Services in Lagos: A 10-Year Review of Hospital Records. *JCO Glob Oncol.*, doi: 10.1200/GO.22.00107. PMID: 36265096; PMCID: PMC9812459.

Omowhara, B. O., Maduka, O., Banjo, A. A. F., & Ameh, S. (2021). Awareness and Acceptability of Self-sampling for Human Papillomavirus Testing among Women in Rural Delta State. *Journal of Epidemiological Society of Nigeria, 1*, 8-9.

Omowhara, B., Soter, S., & Adekunbiola, B. (2023). Cervical cancer screening awareness and uptake among under-screened women in a rural Nigerian community. *The Nigerian Health Journal*, *22*(4), 428–432. Retrieved from Original work published January 7, 2023 https://www.tnhjph.com/index.php/tnhj/article/view/629.

Osei, A. E., Amertil, N.P., Oti-Boadi, Ezekiel. E., Lavoe, H., & Siedu, D. J. (2021). Impact of cervical cancer on the sexual and physical health of women diagnosed with cervical cancer in Ghana: A qualitative phenomenological study. *Womens Health (Lond).*, *17*, 17455065211066075. doi: 10.1177/17455065211066075. PMID: 34937442; PMCID: PMC8724983.

Oyediran, K. A., Adebayo, O. M., & Owolabi, O. D. (2021). Knowledge on cervical cancer screening and vaccination among females at Oyibi Community. *BMC Women's Health, 21*(1), 124.

https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-021-01296-3.

Ronco, G., Dillner, J., Elfström, K. M., Tunesi, S., Snijders, P. J., & Arbyn, M. (2014). Efficacy of HPV-based screening for prevention of invasive cervical cancer: follow-up of four European randomised controlled trials. *Lancet 383*(9916), 524–532. 10.1016/S0140-6736(13)62218-7.

Sahabi, S. M., & Abdullahi, K. (2017). Epidemiological survey of malignant neoplasms in Sokoto, Nigeria. *World Journal of Research and Review*, *4*(4), 262828.

Sean Tackett, J., Hunter Y., Shannon P., Charles W., Katherine D., & Jamil D. B. (2018). Barriers to healthcare among Muslim women: A narrative review of the literature. *Women's Studies International Forum*, *69*, 190-194, ISSN 0277-5395.

Silas, O. A., Manasseh, A. N., Musa, J., Dauda, A. M., Zoakah, A. I., Mandong, B. M., & Murphy, R. L. (2019). Changing patterns in trend of top 10 cancers in the Jos University Teaching Hospital's (JUTH) cancer registry (1996–2018), Jos, north-central Nigeria. *Journal of Medicine in the Tropics*, *21*(2), 81-86.

Smith, R. A., Basu, S., Weinberger, M., Dunne, E. F., Markowitz, L. E., & Centers for Disease Control and Prevention (CDC) (2018). Cervical Cancer Screening: A Review of the Evidence for the 2018 US Preventive Services Task Force Recommendation. *Jama*, *320*(3), 279-296. https://www.ncbi.nlm.nih.gov/books/NBK537348/.

Tatar, O, Wade, K, McBride, E, *et al.* (2018). Are Health Care Professionals Prepared to Implement Human Papillomavirus Testing? A Review of Psychosocial Determinants of Human Papillomavirus Test Acceptability in Primary Cervical Cancer Screening. J. *Womens Health (Larchmt)*. *29*(3):390-405. doi: 10.1089/jwh.2019.7678. Epub 2019 September 3. PMID: 31479381.

Tatar, O., Thompson, E., Naz, A., Perez, S., Shapiro, G. K., Wade, K., & Rosberger, Z. (2018). Factors associated with human papillomavirus (HPV) test acceptability in primary screening for cervical cancer: A mixed methods research synthesis. *Preventive Medicine, 116*, 40-50.

Thomsen, L.T., Kjær, S.K. (2021). Human papilloma virus (HPV) testing for cervical cancer screening in a middle-income country: comment on a large real-world implementation study in China. *BMC Med., 19*(1), 165. doi: 10.1186/s12916-021-02051-z. PMID: 34261466; PMCID: PMC8281637.

Uchendu, O. J. (2020). Cancer incidence in Nigeria: a tertiary hospital experience. *Asian Pacific Journal of Cancer Care*, *5*(1), 27-32.

Ukah, C., & Nwofor, A. (2017). Cancer incidence in south-east Nigeria: a report from Nnewi Cancer Registry. *Orient Journal of Medicine*, *29*, 48-55.

Usman, H.A., Audu, B.M., Sanusi, I.M., Bukar, M., & Hamidu, P.U. (2018). Pattern of cancers at a rural referral centre in Northeastern Nigeria. *Bo Med J., 15*(1):21-8.

Vaccarella, S., Lortet-Tieulent, J., Plummer, M., Franceschi, S., Bray, F. (2013). Worldwide trends in cervical cancer incidence: impact of screening against changes in disease risk factors. *Eur J Cancer*. *49*(15):3262–3273. doi: 10.1016/j.ejca.2013.04.024.

Varer Akpinar, C., & Alanya Tosun, S. (2023). Knowledge and perceptions regarding Human Papillomavirus (HPV) and willingness to receive HPV vaccination among university students in a northeastern city in Turkey. *BMC ' 'Women's Health, 23*, 299 (2023). https://doi.org/10.1186/s12905-023-02455-4.

Vu M., Azmat A., Radejko T., Padela A.I. (2016). Predictors of Delayed Healthcare Seeking Among American Muslim Women. *J. Womens Health (Larchmt) 2*, *25*(6), 586-593. doi: 10.1089/jwh.2015.5517. Epub 2016 February 18. PMID: 26890129; PMCID: PMC5912720.

Waller J., Waite F., Marlow L., (2024). Awareness and knowledge about HPV and primary HPV screening among women in Great Britain: An online population-based survey. *J. Med Screen.*, *31*(2), 91-98. doi: 10.1177/09691413231205965.

WHO (2021). Cervical Cancer Fact Sheet. https://www.who.int/news-room/fact-sheets/detail/cervical-cancer?gad_source=1&gclid=Cj0KCQjwmt24BhDPARIsAJFYKk2cngoBZhc9hHG3niXSrgSvQYz4699mzqgCHUTAsnXw9Qg35JNfczIaAtbzEALw_wcB.

WHO, (2024). Cervical cancer. Accessed on 20 December 2024 and available online at https://www.who.int/news-room/fact-sheets/detail/cervical-cancer.

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Adegbore, A. K., Olabode, A. T., Lawal, M. A., Moshood, F. A., & Bello, B. O. (2025). Knowledge, Perception and Practice of Human Papillomavirus Testing for Cervical Cancer Screening among Females in a Religious Setting in a Southwestern City, Nigeria. *Fountain Journal of Basic Medical and Health Sciences (FUJBMHES)*, *1*(1), 22-35.