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Uptake of cervical cancer screening services and its determinants between health and non-health workers in Ibadan, south-Western Nigeria.

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Background: Female health workers' knowledge about cervical cancer screening may not translate to better uptake. This study compared the uptake of cervical cancer screening services as well as its determinants between female health and non-health workers in Ibadan, Nigeria.
Methods: A comparative cross-sectional design employing a total population survey was conducted among 602 female health and non-health workers using a semi-structured questionnaire. Data were analysed using descriptive and inferential statistics evaluated at 5% significance level.
Results: Mean age for both groups was 40.8 ± 9 years. More health workers (82.4%) compared to non-health workers (28.4%) had good knowledge of cervical cancer ($p < 0.001$). More health workers (98.4%) compared to non-health workers (84.0%) had good knowledge of cervical cancer screening services ($p < 0.001$). Health workers (23.2%) were not different from non-health workers (18.7%) in their uptake of cervical cancer screening services ($p=0.226$). Doctors were more likely to utilize cervical cancer screening services compared to other female health workers (OR: 4.40, 95% CI: 1.577 – 12.280). Non-health workers on grade level 13 and above (OR: 3.83, 95% CI: 1.495 – 9.823) were more likely to utilize cervical cancer screening services compared to those on grade level 01-06, and those with good knowledge of cervical cancer (OR: 2.11, 95% CI: 1.021 – 4.350) compared to those with poor knowledge.
Conclusion: A knowledge-practice gap exists in uptake of cervical cancer screening services among health workers. Awareness campaigns need to be intensified, particularly among health workers who are not doctors, and the middle/lower cadre non-health workers.

Keywords: *Cervical cancer; Cancer screening tests; Uptake of Cancer screening; Healthcare workers; Knowledge of cervical cancer.*

Résumé

Contexte: Les connaissances des femmes agentes de santé sur le dépistage du cancer du col de l'utérus peuvent ne pas se traduire par une meilleure utilisation . Cette étude a comparé le recours aux services de dépistage du cancer du col de l'utérus ainsi que ses déterminants entre les femmes agentes et non-agentes de santé à Ibadan, au Nigéria.
Méthodes: Une étude transversale comparative employant une enquête de la population totale a été menée auprès de 602 femmes agentes et non-agentes de santé en utilisant un semi-structuré questionnaire. Les données ont été analysées à l'aide de statistiques descriptives et inférentielles évaluées à un niveau de signification de 5%.
Résultats: L'âge moyen pour les deux groupes était de 40,8 ± 9 ans. Plus d'agentes de santé (82,4%) par rapport aux non-agentes de santé (28,4%) avaient une bonne connaissance du cancer du col de l'utérus ($p <0,001$). Plus d'agentes de santé (98,4 %) par rapport aux non-agentes de santé (84,0%) avaient une bonne connaissance des services de dépistage du cancer du col de l'utérus ($p <0,001$). Les agentes de santé (23,2%) n'étaient pas différentes des non-agentes de santé (18,7%) dans leur recours aux services de dépistage du cancer du col de l'utérus ($p = 0,226$). Les médecins étaient plus susceptibles d'utiliser les services de dépistage du cancer du col de l'utérus que les autres agentes de santé (OR: 4,40, IC à 95%: 1,577 - 12,280). Les non-agentes de santé de niveau 13 et plus (OR: 3,83, IC à 95%: 1,495 - 9,823) étaient plus susceptibles d'utiliser les services de dépistage du cancer du col de l'utérus par rapport à celles du niveau 01-06 et à celles ayant une bonne connaissance du cancer du col de l'utérus (OR: 2,11, IC à 95%: 1,021 - 4,350) par rapport à celles qui ont de faibles connaissances. *Conclusion:* Il existe un écart de connaissance-pratique dans l'utilisation des services de dépistage du cancer du col utérin parmi les agentes de santé. Les campagnes de sensibilisation doivent être intensifiées, en particulier parmi les agentes de santé qui ne sont pas médecins, et les non-agentes de santé des cadres moyens/inférieurs.

Mots clés: *Cancer du col de l'utérus; Tests de dépistage du cancer; Adoption du dépistage du cancer; Les agentes de la santé; Connaissance du cancer du col de l'utérus.*

Introduction

Cervical cancer continues to be a disease of public health importance globally. This is especially so in developing countries where it has striking and alarming incidence and mortality rates [1]. According to Ferlay and colleagues, almost nine in ten cervical cancer deaths occur in less developed regions [2]. A major contributor to this high mortality rate in developing countries is the late presentation time to heath facilities [3]. This late presentation can however be prevented if women utilize cervical cancer screening services which help detect the pre-cancerous cervical lesions early enough and this should ideally lead to the early institution of corrective measures to prevent progression to invasive carcinoma which is associated with a high mortality [4, 5].

Uptake of cervical cancer screening services has increased remarkably in the developed countries over the years and this has had striking impact in reducing the mortality from the disease in developed countries [6, 7]. The American Cancer Society statistics revealed that cervical cancer used to be one of the most common causes of cancer death among American women, but this has reduced drastically between 1930 and 2016 partly due to increased uptake of screening services [8,9]. This is not the case with developing countries\ [5]. Despite the availability of low-technology and inexpensive screening tools in low-income countries, cancer screening uptake remains a challenge [10-12].

The conventional cytology is considered as the gold standard for cervical cancer screening, especially in developed countries [13,14]. However, in low-resource settings like Nigeria, low-technology and inexpensive screening tools that could significantly reduce the burden of deaths from cervical cancer, such as Visual Inspection with Acetic Acid (VIA) or Human Papilloma Virus DNA (HPV DNA) testing, are preferred alternatives and these should be optimally utilised [13-15].

The studies on uptake of cervical screening done so far in Nigeria among populations have been among single populations such as students, non-health workers and health workers [11,12,16-18]. There is paucity of data on comparative studies on uptake of cervical cancer screening services, particularly between female health workers and other population groups. By virtue of their profession, health workers are, expectedly, supposed to be more aware and knowledgeable about health issues. Furthermore, the general populace also believes that health workers have positive health behaviors, because of their health-related knowledge. Unfortunately, this knowledge may however not necessarily translate to practice when it comes to their own health [10,19,20]. Such perception might make health workers vulnerable to being neglected by important stakeholders when it comes to their health. A comparative study among female health and non-health workers will help in determining what role the health profession plays in the uptake of cervical cancer screening services. It will also help to determine the differential reasons, if any, for the level of cervical cancer screening uptake among the two groups considering their professions. These findings will be instrumental in the implementation of group-specific cervical cancer screening interventions. In this study, we determined and compared the level of cervical cancer screening services uptake as well as the factors associated with the uptake among female health and non-health workers in Oyo State civil service, Ibadan, Nigeria.

Methods

Study setting

This comparative cross-sectional study was conducted among female health and non-health workers within the Oyo State employ. Oyo State is in the south-western part of Nigeria and has Ibadan as its capital city and administrative headquarters. The Oyo State government secretariat houses 15 state ministerial headquarters; namely, the Ministry of Agriculture, Natural Resources and Rural Development; Ministry of Education, Science and Technology; Ministry of Environment and Water Resources; Ministry of Finance and Budget; Ministry of Justice; Ministry of Information, Culture and Tourism; Ministry of Liaison and Intergovernmental Affairs; Ministry of Lands, Housing, Survey and Urban Development; Ministry of Local Governments and Chieftaincy Matters; Ministry of Special Duties; Ministry of Trade, Industry and Cooperative; Ministry of Works and Transport; Ministry of Women Affairs, Community Development, Social Welfare and Poverty Alleviation; Ministry of Youth and Sports; and Ministry of Health.

The ministries, each headed by a commissioner, provide overall direction to all the departments, agencies, and boards under them. The Oyo State Hospital Management Board, under the Ministry of Health,

provides overall direction for all the government-owned secondary health facilities within the state. Five of the government-owned secondary health facilities namely Adeoyo Maternity Hospital, Jericho Nursing Home, Oni Memorial Hospital, Ring Road State Hospital and Jericho General Hospital are located within Ibadan city. Anecdotal report states that all the government-owned secondary health facilities within the state provide cervical cancer screening services.

All consenting female workers who were permanent members of staff of Oyo State were eligible to participate in the study. The female health workers (doctors, nurses, pharmacists, laboratory scientists and hospital attendants) were recruited from the five government-owned secondary hospitals in Ibadan. While the female non-health workers were recruited from the remaining 14 ministerial headquarters.

A minimum sample size of 223 was calculated per group using the formula for estimating 2 proportions, assuming that the estimated proportion of women utilising cervical cancer screening services among civil servants was 10.2% [17]. However, a total sample of all 602 female workers available in the five government-owned secondary hospitals and the 14 ministerial headquarters in Ibadan were recruited for the study, out of which 546 (261 health workers and 285 non-health workers) completed the survey.

Data collection

Data for this study was collected using a **s**emi-structured questionnaire. The questionnaire was self-administered for staff who could complete it independently, while it was interviewer-assisted for some lower cadre workers who were not able to complete the questionnaires independently. The questionnaires were used to obtain information on the respondents' socio-demographic characteristics. It was also used to obtain information about respondents' knowledge of cervical cancer and cervical cancer screening services. Lastly, the instrument was used to obtain information on respondents' uptake of cervical cancer screening test. Data was collected in the months of May and June, 2017.

Data analysis

The data was analyzed using the Statistical Package for Social Sciences version 20.0.

Response on age at which cervical screening test should be done was considered "correct" if the respondent answered either 21 years and above for pap smear; 30 years and above for VIA; or 30 years and above for HPV DNA. Response on how often cervical screening test should be done was considered "correct" if the respondent answered either every three years for pap smear; annually for VIA; or every five years for HPV DNA.

Fifteen questions were used to assess the respondents' knowledge of cervical cancer. The maximum obtainable score was 15 and the minimum was 0. The 50th percentile score was 8. Scores $\geq$ were categorized as good knowledge of cervical cancer while scores < 8 were categorized as poor knowledge of cervical cancer. Six questions were used for the assessment of the knowledge of cervical cancer screening services. The maximum obtainable score was 6 while the minimum was 0. The 50th percentile score was 3. Respondents with scores ≥ 3 were categorized as having good knowledge of cervical cancer screening services while those with scores < 3 were categorized as having poor knowledge of cervical cancer screening services.

Uptake of cervical screening services was determined by asking the question "Have you ever had cervical cancer screening test done before?" Respondents who answered "yes" to this question were considered as having had a cervical cancer screening test done while those who answered "no" were considered not to have had a cervical cancer screening test done.

Summary statistics were generated, and these were used to describe the data. Bivariate analysis using Chi-Square test and Fisher's Exact test were used to determine associations between variables while multivariate analysis using binary logistic regression was done to determine the predictors of uptake of cervical cancer screening services. Level of statistical significance was set at 5%.

Ethical consideration

Ethical approval for this study was obtained from the Oyo State Ethical Review Committee. Permission was also sought from the Head of Service at the Governor's Office in Ibadan, Nigeria and the Chief

Table 1. Socio-demographic characteristics of respondents

Characteristics	Health workers n (%)	Non-health workers n (%)
Designation of health workers (n = 250)		
Doctors	26 (10.4)	N/A
Nurses	154 (61.6)	N/A
Pharmacists	26 (10.4)	N/A
Laboratory scientists	25 (10.0)	N/A
Hospital attendants	19 (7.6)	N/A
Designation of non-health workers (n =225)		
Level 01 – 06	N/A	89 (39.6)
Level 07 – 12	N/A	100 (44.4)
Level 13 and above	N/A	36 (16.0)
Age (in years)		
< 40	92 (36.8)	98 (43.6)
≥40	158 (63.2)	127 (56.4)
	$X^2 = 2.25$	$p = 0.133$
Mean age ± S.D (in years) †	40.8 ± 9	40.8 ± 9
Ethnicity		
Yoruba	239 (95.6)	214 (95.1)
Others ‡	11 (4.4)	11 (4.9)
	$X^2 = 0.06$	$p = 0.800$
Religion		
Christianity	193 (77.2)	179 (79.6)
Islam	57 (22.8)	46 (20.4)
	$X^2 = 0.39$	$p = 0.534$
Marital status		
Single	38 (15.2)	42 (18.7)
Married	205 (82.0)	171 (76.0)
Others §	7 (2.8)	12 (5.3)
	$X^2 = 3.28$	$p = 0.194$
Level of education		
Below tertiary	11 (4.4)	28 (12.4)
Tertiary	239 (95.6)	197 (87.6)
	$X^2 = 10.17$	$p = 0.001$

† S.D – Standard deviation; ‡ Others – Igbo, Hausa; § Others – Divorced, Widowed, Separated; N/A – Not applicable

Consultant of each of the general hospitals where the study was conducted. Written informed consent was obtained from the participants before enrolling them in the study.

Results

Socio-demographic characteristics

A total of 602 questionnaires were administered. Out of these, 546 women filled and returned their questionnaires, giving a response rate of 90.7 %. Only 475 (87%) questionnaires were fit for analysis out of the 546 that were returned. Two hundred and fifty (52.6%) were from the female health workers while 225 (47.4%) were from the female non-health workers.

More than half (61.6%) of the health workers were nurses while 44.4% of the non-health workers were civil servants on grade level 07-12. The meanage was 40.8 ± 9 years for both groups. More of the health workers (95.6% and 82%) compared to the non-health workers (95.1% and 76%) were of the Yoruba tribe and currently married, respectively. In terms of their age, ethnicity, religion, and marital status the female health workers were not significantly different from the non-health workers. (p = 0.133, 0.800, 0.534 and 0.194 respectively) However, in terms of their level of education, 95.6% of the female health workers compared to 87.6% female non-health workers had tertiary education (p = 0.001). (Table 1)

Knowledge about cervical cancer and cervical cancer screening services

Two hundred and forty-six (98.4%) health workers and one hundred and eighty-eight (83.6%) non-health

Table 2. Knowledge of respondents on cervical cancer

Variables	Health workers n (%)	Non-health workers n (%)
Ever heard about cervical cancer		
Yes	246 (98.4)	188 (83.6)
No	4 (1.6)	37 (16.4)
Source of information about cervical cancer †		
Television [no. of Yes (%)]	108 (43.2)	85 (37.8)
Radio [no. of Yes (%)]	85 (34.0)	61 (27.1)
Internet [no. of Yes (%)]	92 (36.8)	55 (24.4)
Print media [no. of Yes (%)]	63 (25.2)	28 (12.4)
Health workers [no. of Yes (%)]	191 (76.4)	74 (32.9)
Religious gatherings [no. of Yes (%)]	34 (13.6)	25 (11.1)
Family and friends [no. of Yes (%)]	35 (14.0)	40 (17.8)
Causes of cervical cancer †		
Spiritual attack [no. of Yes (%)]	17 (6.8)	14 (6.2)
Having sex at an early age [no. of Yes (%)]	92 (36.8)	43 (19.1)
Human papilloma virus [no. of Yes (%)]	179 (71.6)	51 (22.7)
Use of oral contraceptive [no. of Yes (%)]	66 (26.4)	28 (12.4)
Smoking [no. of Yes (%)]	59 (23.6)	16 (7.1)
Excessive alcohol intake [no. of Yes (%)]	41 (16.4)	18 (8.0)
Promiscuity [no. of Yes (%)]	123 (49.2)	52 (23.1)
Unprotected sex [no. of Yes (%)]	66 (26.4)	25 (11.1)
Family history of cervical cancer [no. of Yes (%)]	127 (50.8)	31 (13.8)
Symptoms of cervical cancer †		
Painful menstruation [no. of Yes (%)]	42 (16.8)	19 (8.4)
Excessive menstrual flow [no. of Yes (%)]	89 (35.6)	15 (6.7)
Bleeding after sex [no. of Yes (%)]	197 (78.8)	55 (24.4)
Bleeding after menopause [no. of Yes (%)]	114 (45.6)	26 (11.6)
Foul-smelling vaginal discharge [no. of Yes (%)]	136 (54.4)	55 (24.4)
Can cervical cancer be detected at an early stage?		
Yes	222 (88.8)	111 (49.3)
No	9 (3.6)	7 (3.1)
Do not know	19 (7.6)	107 (47.6)
Overall Knowledge of cervical cancer		
Good	206 (82.4)	64 (28.4)
Poor	44 (17.6)	161 (71.6)
	$X^2 = 140.53$	$p<0.001$

† *Multiple response*

workers have heard of cervical cancer. The top three common sources of information about cervical cancer among the health workers were from health workers (76.4%), the television (43.2%) and the internet (36.8%). Among the non-health workers, the top three common sources of information about cervical cancer were from the television (37.8%), health workers (32.9%) and the radio (27.1%). One hundred and seventy-nine (71.6%) health workers correctly identified the Human Papilloma Virus as the cause of cervical cancer compared to fifty-one (22.7%) non-health workers. Concerning detection of cervical cancer, 88.8% of the health workers correctly stated that it can be detected at an early stage while 49.3% of t non-health workers knew that it can be detectedat an early stage. Overall, 84.2% of the health workers compared to the non-health workers (28.4%) had good knowledge of cervical cancer ($p < 0.001$). (Table 2)

Pap smear was recognised as a screening test for cervical cancer by 90.8% of the health workers and 35.1% of non-health workers while 18.4% of health workers and 8% of non-health workers identified Visual Inspection with Acetic Acid (VIA) as a cervical cancer screening test. Two hundred and twelve (86.2%) health workers and one hundred and eighty-three (96.3%) non-health workers could not correctly state the age at which the cervical cancer screening test should be commenced. The frequency of the screening test was known by 66.3% of health workers and 83.2% of non-health workers. Among the health workers, 72% were aware of a screening centre around them compared to 35.8% of non-health workers. Overall, 98.4% of health workers were

more knowledgeable about cervical cancer screening services compared to 84% of non-health workers ($p < 0.001$).

(Table 3)

Table 3: Knowledge of respondents on cervical cancer screening services

Variables	Health workers n (%)	Non-health workers n (%)
Types of cervical cancer screening services †		
Pap smear [no. of Yes (%)]	227 (90.8)	79 (35.1)
VIA [no. of Yes (%)]	46 (18.4)	18 (8.0)
HPV DNA [no. of Yes (%)]	54 (21.6)	23 (10.2)
Age at which cervical screening should be done		
Correct	34 (13.8)	7 (3.7)
Incorrect	212 (86.2)	183 (96.3)
How often cervical screening should be done		
Correct	83 (33.7)	32 (16.8)
Incorrect	163 (66.3)	158 (83.2)
Awareness of a cervical screening centre around the respondent		
Yes	177 (72.0)	68 (35.8)
No	69 (28.0)	122 (64.2)
Overall knowledge of cervical screening services		
Good	246 (98.4)	189 (84.0)
Poor	4 (1.6)	36 (16.0)
	$X^2 = 31.84$	$p<0.001$

† *Multiple response*

Uptake of cervical cancer screening services

Health workers were not statistically different from the non-health workers with respect to their uptake of cervical screening services. Only 23.2% of the health workers and 18.7% of the non-health workers have had cervical cancer screening done ($p = 0.226$). (Table 4) The highest motivator for undertaking a cervical cancer screening test among both health workers and non-health workers who have been screened was eagerness to know their health status (48.7% and 42.9% respectively). (Table 4)

Fewer (40.6%) health workers who have not been screened for cervical cancer compared to 42.9% of non-health workers who have not been screened said they will be willing to go for the screening if it is free. Fewer (18.2%) health workers were not willing to have a cervical screening test done compared to 32.2% of non-health workers. The commonest reasons for lack of willingness to be screened for cervical cancer among health workers and non-healthworkers, even if it is free or at a reduced cost, is lack of interest (57.1% and 52.5% respectively).

Determinants of cervical cancer screening services uptake

Among the female health workers, the doctors had the highest proportion (42.3%) of staff who had been screened for cervical cancer compared to the nurses(24.0%) and other cadres of female health workers (14.3%). ($p = 0.014$) The female non-health workers who were level 13 and above had the highest proportion (38.9%) of female staff who had been screened for cervical cancer compared to female staff on level 01 – 06 (12.4%) and female staff on level 07 – 12 (17.0%). ($p = 0.002$) Female non-health workers who had good knowledge about cervical cancer had a higher proportion (29.7%) of uptake of cervical cancer screening services compared to those with poor knowledge (14.3%). ($p = 0.007$) Lastly, female non-health workers who had good knowledge of cervical cancer screening services, had a statistically significant higher proportion (22.2%) of them who had been screened for cervical cancer compared to those with poor knowledge (0%). ($p <0.001$) (Table 5)

The only predictor of uptake of cervical cancer services among the female health workers was designation. Female doctors were found to be 4

Table 4: Uptake of cervical screening services among respondents

Variables	Health workers n (%)	Non-health workers n (%)
Uptake of cervical cancer screening services		
No	92 (76.8)	183 (81.3)
Yes	158 (23.2)	42 (18.7)
	$X^2 = 1.46$	$p = 0.226$
Screening practice among respondents that have had screening done (N = 100)		
Number of times screening has been done		
Once	43 (74.1)	27 (64.3)
Two or more times	15 (25.9)	15 (35.7)
Last time screening was done		
≤3 years ago	44 (75.9)	30 (71.4)
>3 years ago	14 (24.1)	12 (28.6)
Factors that motivated uptake among screened respondents (n=67)		
Eagerness to know my health status	19 (48.7)	12 (42.9)
Health worker/health education	2 (5.1)	6 (21.4)
Free medical outreach/screening	4 (10.3)	5 (17.9)
Routine medical check-up	4 (10.3)	3 (10.7)
Health issues	8 (20.5)	0 (0.0)
Family and friends	2 (5.1)	2 (7.1)
Willingness to be screened among respondents that have never had screening test done (N = 375)		
Willingness to have a screening test done		
Yes; if free	78 (40.6)	79 (43.2)
Yes; if at a reduced cost	79 (41.2)	45 (24.6)
No	35 (18.2)	59 (32.2)
Reasons for lack of willingness to have screening test done †		
Not interested	20 (57.1)	31 (52.5)
Not at risk	5 (14.3)	2 (3.4)
Scared of outcome	2 (5.7)	2 (3.4)
Fear of procedure	3 (8.6)	2 (3.4)
Screening service environment is not conducive	0 (0.0)	3 (5.1)
Screening procedure is embarrassing	0 (0.0)	1 (1.7)
Would wait for a later date	1 (2.9)	6 (10.2)
Lack of time	1 (2.9)	5 (8.5)

† *Multiple response*

times more likely to have been screened for cervical cancer compared to other cadres of female health workers. (OR = 4.4, 95% CI = 1.577 – 12.280). Among the female non-health workers, designation and knowledge of cervical cancer were predictors of uptake of cervical cancer. Female non-health workers who were on level 13 and above were 4 times more likely to have been screened for cervical cancer compared to female non-health workers who were on level 01 to 06. (OR = 3.83, 95% CI = 1.495 – 9.823). Lastly, female non-health workers with good knowledge of cervical cancer were 2 times more likely to have been screened for cervical cancer compared to those with poor knowledge of cervical cancer. (OR = 2.11, 95% CI = 1.021 – 4.350).

Discussion

Female health workers in this study were found to be more knowledgeable about cervical cancer compared to the female non-health workers. This comparative study corroborates the findings from previous single population studies conducted among these groups. Oche and colleagues found that 98.6% of the female health workers interviewed in their study in North Western Nigeria were knowledgeable about cervical cancer [12]. Similarly, Awodele and colleagues in their study conducted in South Western Nigeria on cervical cancer screening amongst nurses in Lagos University Teaching Hospital, Lagos, Nigeria also reported a high proportion (99%) of health workers with good knowledge of cervical

Table 5: Bivariate and logistic regression analysis of predictors of uptake of cervical cancer screening

Uptake of cervical cancer screening services

Variables	Non-Health workers							
	No n (%)	Yes n (%)	Adjusted OR (CI) ‡	p-value***	No n (%)	Yes n (%)	Adjusted OR (CI) ‡	p-value***
Designation of health workers								
Doctors	15 (57.7)	11 (42.3)	4.40 (1.577 – 12.280)	**0.005**	N/A	N/A	N/A	N/A
Nurses	117 (76.0)	37 (24.0)	1.90 (0.883 – 4.077)	0.101	N/A	N/A	N/A	N/A
Others †	60 (85.7)	10 (14.3)	1.00 (Reference)		N/A	N/A	N/A	N/A
	X^2 = 8.51	**P = 0.014***						
Designation of non-health workers								
Level 01 – 06	N/A	N/A	N/A	N/A	78 (87.6)	11 (12.4)	1.00 (Reference)	
Level 07 – 12	N/A	N/A	N/A	N/A	83 (83.0)	17 (17.0)	1.47 (0.644 – 3.357)	0.360
Level 13 and above	N/A	N/A	N/A	N/A	22 (61.1)	14 (38.9)	3.83 (1.495 – 9.823)	0.005
					X^2 =12.21	P = 0.002*		
Age (in years)								
< 40	72 (78.3)	20 (21.7)			85 (86.7)	13 (13.3)		
≥40	120 (75.9)	38 (24.1)			98 (77.2)	29 (22.8)		
	X^2 = 0.17	P = 0.676*			X^2 = 3.34	P = 0.068*		
Ethnicity								
Yoruba	184 (77.0)	55 (23.0)			174 (81.3)	40 (18.7)		
Others	8 (72.7)	3 (27.3)			9 (81.8)	2 (18.2)		
		P = 0.721**				P = 1.000**		

*† Others – Pharmacists, laboratory scientists and hospital attendants; * p-value in Chi-square test; ** p-value in Fisher's Exact test; ‡ Adjusted odds ratio in binary logistic regression (confidence interval); *** p-value in binary logistic regression*

Table 5: Bivariate and logistic regression analysis of predictors of uptake of cervical cancer screening

	Health workers	Non-health workers	Uptake of cervical cancer screening services			
Variables	No n (%)	Yes n (%)	Adjusted OR (CI) ‡	p-value***	No n (%)	Yes n (%)
Marital status						
Not currently married †	37 (82.2)	8 (17.8)			46 (85.2)	8 (14.8)
Currently married	155 (75.6)	50 (24.4)			137 (80.1)	34 (19.9)
	$X^2 = 0.91$	P = 0.341*			$X^2 = 0.69$	P = 0.405*
Religion						
Christianity	151 (78.2)	42 (21.8)			147 (82.1)	32 (17.9)
Islam	41 (71.9)	16 (28.1)			36 (78.3)	10 (21.7)
	$X^2 = 0.98$	P = 0.321*			$X^2 = 0.36$	P = 0.549*
Level of education						
Below tertiary	11 (100.0)	0 (0.0)			24 (85.7)	4 (14.3)
Tertiary	181 (75.7)	58 (24.3)			159 (80.7)	38 (19.3)
		P = 0.073**				P = 0.615**
Knowledge of cervical cancer						
Good	155 (75.2)	51 (24.8)			45 (70.3)	19 (29.7)
Poor	37 (84.1)	7 (15.9)			138 (85.7)	23 (14.3)
Knowledge of cervical cancer screening services						
Good	188 (76.4)	58 (23.6)			147 (77.8)	42 (22.2)
Poor	4 (100.0)	0 (0.0)			36 (100.0)	0 (0.0)
		P = 0. 576**				**P < 0.001****

*† Not currently married – Single, Widowed, Divorce, Separated; * p-value in Chi-square test; ** p-value in Fisher's Exact test; ‡ Adjusted odds ratio in binary logistic regression (confidence interval); *** p-value in binary logistic regression*

cancer [21]. In the same vein, previous studies conducted among non-health workers showed that the proportion of non-health workers who were knowledgeable about cervical cancer was not as high as that recorded among health workers. Two studies conducted in the North Central region of Nigeria revealed that the proportion of female non-health workers knowledgeable about cervical cancer were 50.9% and 67% respectively [17,22].

The fact that health workers are more knowledgeable about cervical cancer is not surprising and it is in fact expected. Their profession as health workers gives them an upper edge over the non-health workers. Health workers have always been in contact with the health environment since their training periods and as such have first-hand information about cervical cancer from their trainers, colleagues, co-workers, self-study and professional experience. Some of these sources of information about cervical cancer were corroborated by the findings from this current study which revealed that quite a number of the health workers (76.4%) got their information from the health workforce who can either be their trainers, colleagues or co-workers.

Like the knowledge of cervical cancer, female health workers were found to be more knowledgeable about cervical cancer screening services compared to the female non-health workers in the overall analysis for knowledge of cervical cancer screening services. A high proportion of health workers were aware of Pap smear compared to non-health workers and which has also been documented in other studies [12, 17]. However, in other domains used to measure the overall knowledge of cervical cancer screening services we recorded a low proportion in both groups. Very few female health and non-health workers were aware of VIA and HPV DNA. Also, very few respondents in both groups knew the correct age at which cervical cancer screening tests should commence and the interval for the screening. This finding underscores the need to raise awareness on this information among females irrespective of their occupation for the derivation of maximum benefit from these services.

It was a bit surprising and disturbing to find that health workers were not different from non-health workers in their uptake of cervical cancer screening tests in this study. As health workers, due to their knowledge and role in the prevention and treatment of cervical cancer, one would expect that more health workers will undertake cervical cancer screening. This is however not the case as revealed by this study. Being a health worker does not guarantee the fact that a woman will go for a cervical cancer screening test and this indicates a huge knowledge-practice gap. Prevention programs should not assume health workers will go for

cervical cancer screening, rather health workers should be one of the major target groups for prevention so that they do not become neglected.

Apart from the fact that health workers were not different from non-health workers in their cervical screening uptake, the proportion of respondents who have had cervical cancer screening done among the two populations that were assessed in our study was a bit low. Previous studies conducted separately among these groups in Nigeria reported similarly low values. Ugwu and colleagues reported an uptake of 14.1% among female health workers in South Eastern Nigeria [18]. Oche and colleagues reported an uptake of 10% among health workers in Northern Nigeria [12]. Ehiemere and colleagues also reported an uptake of 26.4% in a more recent study among health workers [11]. A similar pattern of uptake had also been observed in studies among the non-health workers. Owoeye and colleagues reported an uptake of 13% among Federal civil servants in the Niger Delta region of Nigeria [23]. Hyacinth and colleagues reported an uptake of 10% among federal civil servants in North Central Nigeria [17], while, more recently, Modibbo and colleagues reported an uptake of 38.8% among Nigerian women that were selected from the general population [24].

From our study, a major reason why some of the women in both groups have not had cervical screening test done was cost. They were willing to screen for cervical cancer if it was made free or even if it was available at a reduced cost. This finding underscores the need to further subsidize the cost for cervical cancer screening by important government and non-governmental agencies involved. Hopefully, this will help increase the coverage of cervical cancer screening among eligible women. In addition to cost subsidy, there is also an urgent need to engage in aggressive awareness messages to all women who are eligible for cervical screening irrespective of their occupation if a reduction in the cervical cancer burden is truly desired. This assertion was also made by Abiodun and colleagues [25].

These awareness programs should include motivational messages to heighten the interest of eligible women as some women who were not willing to go for cervical cancer screening in this study said they were not going to assess cervical cancer screening services because they were just not interested, even if it is free or at a reduced cost. The awareness program should also address other barriers associated with uptake of cervical cancer screening services in sub-Saharan Africa which was documented in a recent systematic review [26]. This includes improving cervical cancer education and addressing cultural beliefs and practices.

In moving forward, the result of our logistic regression helps us to identify the group of health workers and non-health workers that should be prioritized when designing the intervention packages. Among the health workers, other health workers like the pharmacists, laboratory scientists and health attendants should be the target. This finding sounds to reason. This group of health workers may not have enough information on how screening could help to prevent cervical cancer when compared to the doctors and nurses who are more clinically oriented. Hence, they may not see a need to utilize cervical cancer screening services for prevention. Among the non-health workers, officers on salary grade level 01 to 12 with poor knowledge of cervical cancer should be the target for improved education on cancer screening services.

A major limitation in this study was the sample size. The sample size used for each group in this comparative study was not large enough. Hence, a few cells in the bivariate analysis had zero counts and such variables could not be fitted into the logistic regression model. Despite this limitation however, this study was able to highlight some important information which will be useful in improving the uptake of cervical screening among health workers and non-health workers.

Conclusions

This study demonstrated that female health workers were not different from female non-health workers with regards to their uptake of cervical cancer screening services despite their better knowledge of cervical cancer and cervical cancer screening services. This implies a knowledge-practice gap among health workers and is a major cause for concern.

To address the low uptake of cervical cancer screening services in both groups, awareness efforts should be intensified by concerned stakeholders while also further subsidizing the cost of the cervical cancer screening services. The awareness program should target female health workers who do not have much clinical orientation and the middle and lower cadre non-female health workers.

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