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Knowledge, perception and predictors of uptake of cervical screening among rural Nigerian women

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Cervical screening is effective in mitigating the morbidity and mortality of cervical cancer. However, the uptake of cervical screening is still unsatisfactory in many countries. The aim of this study was to assess the knowledge and perception of rural Nigerian women about cervical cancer and screening. The study also investigated the predictors of cervical screening. A survey with interviewer administered questionnaires was conducted on 800 Nigerian women recruited from households in Ogun State by a multi-staged sampling method. Participants were aged 25 to 64 years. Proportion of respondents with very poor knowledge and poor perception about cervical cancer were 93.9 and 94%, respectively. Hence, it is not surprising that the uptake of cervical screening is abysmally low (3.9%). Age, knowledge and perception about cervical cancer were related to uptake of cervical screening; however, only perception about cervical cancer was found to predict the uptake of cervical screening. There is a need for deliberate multi strategy program to enhance cervical screening. The strategy must include creation of awareness, health promotion and education about cervical cancer and screening. The strategies should target improving the perception of women about cervical cancer and screening.

Key words: Cervical cancer, uptake of cervical screening, knowledge, perception and predictors.

INTRODUCTION

Cervical cancer is a malignant neoplasm of the cervix uteri or cervical area. Cervical cancer is seen only in women, because men do not normally have cervix. Globally, there are nearly 1.4 million cases of clinically recognized cervical cancer (World Health Organization/Institut Català d'Oncologia (WHO/ICO), 2010). It is estimated that as many as 7 million women will have high-grade changes in the cervix (almost becoming cancer), globally, of which 80% of are in developing countries like Nigeria (WHO/ICO, 2010). It is the second commonest cancer of women worldwide, trailing behind breast cancer. Cervical cancer remains the commonest genital tract cancer (Curado et al., 2007).

Industrialized countries have reduced its incidence by over 70% in the last 50 years; however, the burden seems to be on the rise in less developed countries (Curado et al., 2007). Several countries in North America and Europe have successfully achieved high screening rates and significant reductions of 20 and 60% in cervical cancer mortality with population-wide screening (Berg,

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2003). However, studies show that the cervical screening rate is low in many other populations (Lee et al., 2008; Sairafi and Mohamed, 2009).

The most important risk factor for cervical cancer is in frequent screening or lack of accessible cervical screening services. Other risk factors are early age at sexual contact, exposure to human papilloma virus infection (HPV), early marriage (below age 20 years), multiple sex partners, polygamy, multiparty and lack of awareness of the disease itself (Kumar et al., 2007).

Early detection of cervical cancer will lead to a better prognosis resulting in a decrease in the mortality and health care costs. If undetected, individuals suffer and there are also adverse social effects on the families and the community (WHO, 2006). Cancer of the cervix can be prevented by providing widespread and regular cervical screening services for all women who have been sexually active. This is done by pap smear test or visual inspection of the acetic acid painted cervix (VIA) which is affordable and more sensitive. Vaccination against the HPV in women before the onset of sexual activity also prevents the disease. This is however very expensive at the moment. The One-Visit Approach–screening with VIA by trained personnel and provision of cryotherapy for obvious mild to moderate cervical dysplasia is recommended for developing countries (RTCOG, 2003).

It is likely that the uptake of cervical screening is related to the knowledge and perception about cervical cancer and screening and the perception of personal risk of cervical cancer. Although these factors have been widely studied among North American and European women, very few studies are reported among Africans and indeed Nigerians. It is not known whether these factors contribute to the low cervical screening rates in many other countries. This study examines the connection between the uptake of cervical screening rate and women's knowledge about cervical cancer and cervical screening as well as their personal risk perception.

Only about 15% of women aged 20 to 65 years in the South-West region of Nigeria have heard about the disease (Curado et al., 2007). The majority (60%) of this population live in rural areas with no access to cervical screening. Currently in Nigeria, less than 10% of women are screened (WHO/ICO, 2010), whereas 40 to 50% of women are screened in developed countries (Curado et al., 2007). In Hong Kong, the estimated percentage of women aged between 18 and 64 years that have been screened for cervical cancer was 62.0% in 2012 (Hong Kong Department of Health, 2008).

Nigeria has a population of 40.43 million women aged 15 years and older who are at risk of developing cervical cancer (WHO/ICO, 2010). Current estimates indicate that every year 14,550 women are diagnosed with cervical cancer and 9,659 die from the disease (WHO/ICO, 2010). Cervical cancer ranks as the 2nd most frequent cancer among women in Nigeria, and the second most frequent cancer among women between 15 and 44 years of age (WHO/ICO, 2010). About 23.7% of women in the general population are estimated to harbour cervical HPV infection at a given time, and over 90% of invasive cervical cancers are attributed to HPVs 16 or 18. It is projected that in 2025, there will be 22,915 new cervical cancer cases and 15,251 cervical cancer deaths in Nigeria (WHO/ICO, 2010).

In the developing world, the burden of cervical cancer is huge. The incidence and mortality rates are in excess of the average worldwide rates of 15.3 per 100,000 women per year and 8.2 per 100,000 women per year, respectively (WHO/ICO, 2010). The age standardized incidence rate for cervical cancer in Nigeria is more than double of the world's average (WHO/ICO, 2010). Gambia, Mali, Uganda, and Zimbabwe have age standardized incidence rates of 32.5, 37.7, 47.5 and 47.4 per 100,000 women per year, respectively (Globocan, 2008). The age standardized mortality rate in Nigeria is 22.9 per 100,000 women per year, while that of Western Africa is 24.0 (WHO/ICO, 2010).

There is evidence to suggest that client factors influence the uptake of cervical screening by women as consistently reported among different populations including Asians, Caucasian and Latin-American women (Oscarsson et al., 2008; Eaker et al., 2001; McMullin, 2005). Such factors include women's knowledge, beliefs, and attitudes towards cervical cancer and screening (Twinn and Cheng, 2000).

Some demographic variables have been found to predict the uptake of cervical screening. For example Gupta et al. (2002) found that people in younger age groups and those with higher levels of education were more likely to have had cervical screening (Gupta et al., 2002). However, the decision by a woman to have cervical screening often involves a complex interplay of factors (Oscarsson et al., 2008).

This study was designed based on the Health Belief Model (HBM). HBM proposes that the perception of the severity of illness, susceptibility to illness and its consequences are the factors that predict the likelihood of a person taking recommended preventive health action (Ajzen and Fishbein, 1980; Hochbaum, 1958).

This study investigated the knowledge of cervical cancer and risk factors as well as the perception of risk of cervical cancer.

MATERIALS AND METHODS

Design and sample

This study used a cross-sectional design. Participants were women in Odogbolu and Ikenne Local Government Areas (LGA) of Ogun State in South-West Nigeria. The study was approved by the Scientific and ethical review committee of the Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria. A total of 700 women (350 in each LGA) were recruited in person by a multi-staged random sampling method from household in the communities. Eligible participants were invited to participate and the

Table 1. Knowledge and perception of participant abut cervical cancer and screening.

Parameter	Frequency	Percentage
Knowledge assessment		
Very poor	657	93.9
Poor	19	2.7
Good	10	1.4
Very good	14	2.0
Perception assessment		
Poor	658	94.0
Good	42	6.0

purpose of the study was explained. Consenting women were then interviewed by trained research assistants using a questionnaire which was designed, pretested and corrected for the purpose.

Instrument

A validated scale was used to assess women's knowledge about cervical cancer and screening and risk perception. The questionnaire contained open and close ended questions and was used to assess the demographics, awareness, knowledge, and perception of cervical cancer and screening. It also assessed the uptake of cervical screening. The questionnaire was pretested among 70 women Remo North LGA (a similar LGA to Odogbolu and Ikenne LGA) and necessary adjustments were made.

Data analysis

Knowledge and perception were scored by assigning one (1) mark for each correct answer in response to a related question. The maximum knowledge score was 40; scores from 0 to 14 were designated as 'very poor', scores from 15 to 19 were designated as 'poor', scores from 20 to 24 were designated as 'good' while scores greater than 24 were designated as 'very good'. The maximum perception score was 5; scores from 0 to 2 were designated as 'poor' while scores from 3 to 5 were designated as 'poor'.

The chi-squared test was used to examine the relationships between uptake of cervical screening and non-parametric variables, whereas the independent *t*-test was used to test the relationships between the uptake of cervical screening and continuous variables (knowledge and perception of cervical cancer and screening).

Pearson's correlation was performed to determine the relationships between the uptake of cervical screening and age, marital status, level of education, average monthly income, employment status, knowledge and perception of cervical cancer and screening itself.

Logistic regression was used to predict the uptake of cervical screening based on the knowledge and perception of cervical cancer as well as demographic factors that were found to be associated with the uptake of cervical screening. The factors included in the logistic model were age, marital status, level of education, average monthly income, employment status, knowledge of cervical cancer and screening and perception about cervical cancer. The Hosmer and Lemeshow χ^2 test of goodness-of-fit was used to test the overall fit of the logistic model. All statistical analyses were performed using SPSS version 16.0 with 95% level of significance.

RESULTS

Respondents' characteristics

A total of 700 questionnaires were analyzed. The mean and median ages of the respondents were 33.71±9.52 and 30 years, respectively. More than two-thirds (n=489, 69.9%) of the respondents are Christians. More than half of the respondents (n = 429, 61.3%) completed at least secondary school or higher level, while as much as 50 (7.1%) had received no formal education. The vast majority (n= 589, 84.1%) of the respondents were married, while 82 (11.7%) were single.

One hundred and nine (15.6%) respondents were aware of cervical cancer. While 58 (8.3%) had heard of cervical screening before, only 27 (3.9%) of the respondents had ever had cervical screening done.

Knowledge and perception of participant about cervical cancer and screening

Table 1 shows the assessment of the knowledge and perception of the respondents to cervical cancer and screening. The questions that were used to assess knowledge included those that determined whether the participant knew that HPV was implicated as a cause of cervical cancer, their knowledge of risk and protective factors, the knowledge of symptoms and knowledge about cervical screening. The knowledge and perception of the respondents was generally poor with an excess of 90% of them having very poor knowledge and poor perception scores.

Uptake of cervical screening was significantly associated with knowledge and perception scores. The mean total knowledge score was higher for screening than non-screening (t = 7.54, P= 0.000). The mean total perception score was higher among those who had done a cervical screening than those who had not (t= 8.77, P = 0.000).

Correlations of socio-demographic factors, knowledge and perception with uptake of cervical screening

Table 2 shows that uptake of cervical screening is positively correlated with age, knowledge and perception. The correlation with perception was stronger than knowledge which in turn was stronger than that with Age.

Predictors of uptake of cervical screening

Table 3 shows the odds ratio of the predictors of uptake of cervical screening. Hosmer and Lemeshow goodness-of-fit test indicated a good fit of the logistic model (χ^2 =5.967, df = 6, P = 0.427). Nagelkertke's R^2 was 0.227 which was an index of approximation to R^2 from OLS

Table 2. Correlations of socio-demographic factors, knowledge and perception with uptake of cervical screening.

Parameter	Screened (N= 27) n (%)/χ±SD	not screened (N= 673) n (%)/χ±SD	r	P value
Age groups (years)				
25-34	8 (29.6)	442 (65.7)		
35-44	10 (37.0)	141 (21.0)	-0.122	0.001
45-54	8 (29.6)	55 (8.2)		
55-64	1 (3.7)	35 (5.2)		
Marital status				
Single	2 (7.4)	80 (11.9)		
Married	24 (89.9)	566 (84.1)	0.001	0.979
Divorced	1 (3.7)	4 (0.6)		
Widowed	0 (0.0)	16 (2.4)		
Separated	0 (0.0)	7 (1.0)		
Occupation				
Student	0 (0.0)	37 (5.5)		
Unemployed	2 (7.4)	39 (5.8)		
Employed	8 (29.6)	64 (9.5)	0.014	0.705
Self-employed	16 (59.3)	521 (77.4)		
Retired	1 (3.7)	2 (0.3)		
housewife	0 (0.0)	10 (1.5)		
Level of education				
No formal education	1 (3.7)	49 (7.3)		
Primary school	13 (48.1)	208 (30.9)	-0.013	0.735
Secondary school	6 (22.2)	344 (51.1)		
Tertiary school	7 (25.9)	72 (10.7)		
Mean average monthly income	14,285.7±14,256.2	11,572.92±27,679.2	-0.019	0.656
Mean Age	39.1±9.4	33.5±9.5	-0.113	0.003
Mean knowledge score	9.7±11.7	1.6±5.1	-0.274	0.000
Mean perception score	2.4±1.8	1.1±0.7	-0.315	0.000

regression. The perception about cervical cancer was the only significant factor identified after controlling for all other factors in the model. Respondents whose perception about cervical cancer was rated to be good were likely to get a cervical screening done.

DISCUSSION

This study assesses the knowledge and perception about cervical cancer and screening. It also reports the determinants of uptake of cervical screening.

The awareness of cervical cancer and screening is very low; knowledge and perception about cervical cancer, poor. Hence, it is not surprising that the uptake of cervical screening is abysmally low just like in many other developing Asian and African countries (IARC, 2004). This is in spite of the fact that more than forty million Nigerians are at risk of cervical cancer and the existence of a huge morbidity and mortality from the disease (WHO/ICO, 2010; Zayyan, 2010). There is a need for deliberate creation of awareness, health promotion and education about cervical cancer and screening. This is especially important given the ease of prevention of the disease and the lack of capacity in the country to deal with advanced disease (WHO/ICO, 2010; Zayyan, 2010; Amotsuka, 2007).

Age, knowledge and perception about cervical cancer were related to uptake of cervical screening; however, only perception about cervical cancer was found to predict the uptake of cervical screening. A study among Hong Kong Chinese women also showed a similar increase

Table 3. Predictors of uptake of cervical screening.

Parameter	B	SE	P	OR	CI
Age					
Less than 45 years ≥ 45 years	1.152	0.593	0.052	3.164	0.990-10.110
Marital status					
Not married Married	-1.994	1.316	0.130	0.136	0.010-1.794
Level of education					
Less than secondary school At least secondary school	0.052	0.578	0.928	1.053	0.339-3.273
Average monthly income					
Less than 10,000 Naira ≥ 10,000 Naira	-0.308	0.529	0.560	0.735	0.261-2.070
Employment status					
Unemployed Employed	-0.594	1.277	0.642	0.552	0.045-6.747
Knowledge					
Poor Good	0.734	0.790	0.353	2.084	0.443-9.800
Perception					
Poor Good	3.219	0.670	0.000	25.007	6.721-93.042

in uptake and cervical screening with age (Leung and Leung, 2010). Studies conducted in other parts of the world have also demonstrated association between the uptake of cervical screening and knowledge, beliefs and overall perception about cervical cancer (Twinn and Cheng, 2000; Leung and Leung, 2010; Kemm and Close, 1995; Gu et al., 2012, 2013; Tacken et al., 2007). However, Leung et al. (2010) found that the patient's level of education to be related to uptake of cervical screening which is not the case in this study. The finding of perception about cervical cancer being a predictor of uptake of cervical screening is corroborated by studies among Chinese women (Leung and Leung, 2010; Kemm and Close, 1995). Leung et al. (2010) also identified other predictors as: age above 37 years, attendance of tertiary institution of learning and good knowledge of risk factors. Age, knowledge and levels of education were not found to be predictors in this study. There may be other factors which have not been considered in this study. Geographic accessibility has been found to be a barrier to uptake of screening services in many studies in Nigerian and indeed sub-Saharan Africa. The finding also supports the health belief model (HBM). It is therefore very important for policy makers and program managers to consider improving the perception of women as an integral part of any program aimed at ensuring that women have cervical screening done.

This study has limitations in the design. The study relied wholly on answers given by the women interviewed. The uptake of cervical screening was reported by the respondents without recourse to any objective record. The responses may be different from the actual situation.

Conclusion

This study found the awareness and knowledge of cervical cancer and screening to be very low with an accompanying low rate of cervical screening uptake. Although age, knowledge and perception of cervical cancer were found to be related to uptake, the perception of the women about cervical cancer and screening was the sole predictor of uptake that was detected. The perception of rural Nigerian women about cervical cancer and screening is therefore the vital element to increasing

the demand for cervical screening services.

There is a need for deliberate multi strategy program which must include creation of awareness, health promotion and education about cervical cancer and screening. The strategies should target improving the perception of women about cervical cancer and screening. There will also be need to ensure accessibility of the services.

Additional studies to determine the effect of measures aimed at improving the perception of women about cervical cancer and screening on the upake of cervical screening in Nigeria are recommended. Other possible predictors like accessibility, traditional and religious beliefs should also be assessed.

Conflict of interest

The author reports no conflicts of interest in this work.

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