

Educational intervention on knowledge of cervical cancer and uptake of Pap smear test among market women in Niger State, Nigeria

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Abstract

Cervical cancer is the most common female genital tract carcinoma worldwide. It is increasingly becoming the leading carcinoma seen among women in the developing world. The aim of our study was to showcase the effect of educational intervention on the knowledge of cervical cancer and subsequently the uptake of Pap smear test amongst market women in Niger state, Nigeria. The state has a rich network of markets in all the local government areas because of the fishing activities, bountiful agricultural produce yearly and its situation to the North of the national capital, Abuja. This was a quasi-experimental study conducted in two groups with pre and post intervention data collection. Sample size was determined based on a previous similar study done in Nigeria. Multi stage sampling technique was used for recruiting the study participants. SPSS statistical software was used for data entry, editing and analysis. Respondents' knowledge of cervical cancer were comparable at pre-intervention but were statistically significantly better ($P<0.0001$) at post-intervention in the intervention group compared to the control group for every variable measured. However, there was only a (Fisher's exact, $P=0.621$) compared to the control group. This study showed an increase in knowledge about cervical cancer and Pap smear test however the uptake of Pap smear test remained low even after intervention. This underscores the need for sustained intervention programs to eventually translate knowledge acquired to habitual practice.

Introduction

Cervical cancer is one of the most com-

mon malignancies among women worldwide. It is the most common female genital tract carcinoma worldwide and also seen as the most commonly occurring carcinoma among women in the developing world.¹⁻⁴ Analysis of an indicator of disease burden which measures years of life lost (YLL), has shown that cervical cancer caused a loss of 2.4 million weighted YLL among women aged 25-65 years in developing countries as compared with 0.3 million YLL in the developed countries.⁵

Many factors have been implicated in the development of cervical cancer. They include infection with high risk human papilloma virus (HPV type 16 and 18), early sexual debut, high parity, multiple sexual partners, co-infection with human immunodeficiency virus (HIV) type-2, immunosuppressants, and certain dietary deficiencies.⁶ HPV has been shown to be responsible for more than 90% of the cases of invasive cervical cancer worldwide, and it is related to 80% of pre-cancerous changes in the cervix.^{7,8}

Primary prevention of cervical cancer is more challenging than prevention of most other sexually transmitted infections. HPV-infected women generally are asymptomatic, HPV is transmitted easily, and no therapies eliminate the underlying infection.⁹ Vaccines (Cervarix and Gardasil) have been developed and used with encouraging results in some developed countries, but vaccination as a means of primary prevention appears several years away especially in developing countries due to certain considerations policymakers will need to make. Considerations such as building capacity for initiating and sustaining an immunization programme for adolescents, affordability (Cervarix costs about \$360/60,000 Naira for full dose per person) and cost effectiveness of vaccination relative to other programmes competing for resources and the likelihood of cultural acceptability, political will and public support.¹⁰ Secondary prevention involves using relatively cheap screening and treatment technologies that can detect dysplasia before it progresses to invasive cancer and therefore is still the preferred control strategy especially in developing countries.¹¹

Eighty percent of cancer of the cervix may be prevented by early diagnosis and treatment of these premalignant states.¹ Systematically organized population based programmes have been found useful in preventing cervical cancer.¹¹ Cervical cancer cytological screening (Pap smear) test has been found to be the most cost effective screening test.¹² In many of the developed countries the annual incidence and mortality from this cancer has gone down by 50-

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70% since the introduction of population based cytological screening test.^{1,7}

The lack of effective screening programmes aimed at detecting and treating precancerous conditions is a key reason for the much higher cervical cancer incidence in developing countries. It has been estimated that only about 5% of women in developing countries have been screened for cervical dysplasia in the past 5 years, compared with 40-90% of women in developed countries.^{13,14} The aim of our study was to showcase the effect of educational intervention on the knowledge of cervical cancer and subsequently the uptake of Pap smear test amongst market women in Niger state, Northcentral Nigeria.

Materials and Methods

Background information on study area

Niger state is situated in the Northcentral region of Nigeria. The river Niger from which it derives its name runs across the entire southern boundary of the state. The river Kaduna flows into it along its course in the state. Three (3) hydroelectric dams are also located in the state. Fishing is an important occupation especially along the vast riverine network in the state. The state is also blessed with one of the largest and most fertile agriculture lands in the country making farming a viable occupation and the state producing most of Nigeria's staple crops. It also has vast cattle grazing lands. The state has a rich network

of markets in all the LGAs because of the fishing activities, bountiful agricultural produce yearly and its situation to the North of the national capital, Abuja.

Study design

A quasi-experimental study with intervention and control groups and pre-test, post-test design conducted in the first half of 2014.

Inclusion criteria

Registered market women in selected market associations.

Sample size determination

Sample size was determined based on findings from a previous similar study in Nigeria. A minimum sample size of 84 was obtained for each group (intervention and control), a correction for non-response was done and 93 participants were enrolled per group. Sampling: Multi stage sampling technique was used for recruiting the study participants into the study groups. Two health zones were selected from the three in the state using simple random sampling and randomly assigned as the intervention and control groups. One LGA each was selected from each of the selected health zones using simple random sampling. Three wards with markets were eventually selected from each selected LGA. Subsequently, participants were recruited using systematic random sampling into the intervention and control group.

Data collection

The intervention was in 3 stages.

Stage I: This was the pre-intervention phase, which involved the collection of cross-sectional baseline information using

interviewer administered questionnaires consisting of structured, close-ended items. The study instrument was divided into sections comprising of socio-demographic information, knowledge of cervical cancer risk factors and symptoms and Pap smear which were administered by trained female interviewers.

Stage II: The intervention was the provision of health education on cervical cancer for the intervention group only. Information, Education and communication (IEC) materials were produced by the researchers and the content was written in both English and the local languages (Nupe, Hausa) languages and was distributed at the end of each educational meeting (two sessions were held four weeks apart) to all participants in the intervention group.

Stage III: A post-intervention survey was carried out 3 months after the intervention to provide sufficient time for a levelling effect. The same instrument that was used for data collection pre-intervention was also used at post-intervention in both groups. After post-intervention data collection, the control group was also given a series of health education intervention to enable them benefit from the essence of the study.

Data analysis

The proportion of the respondents who knew about the risk factors, symptoms, prevention and diagnosis of cervical cancer and knew about indication for Pap smear were used as indices for the measurement of knowledge of cervical cancer among the respondents.

The questionnaires were manually checked for completeness. SPSS statistical software was used for data entry, editing

and analysis. Mean and standard deviation of quantitative variables were done while mean difference of quantitative variables in both groups and between pre and post intervention were checked for using independent and paired t test respectively. Statistical tests of significance between pre- and post-intervention data were done using Chi-square for categorical variables, with level of significance set at $P<0.05$.

The Research and Ethics Committee of the Usmanu Danfodiyo University Teaching Hospital approved the study protocol. Permission was sought from the Niger state Ministry of health and the necessary market authorities and informed consent obtained from the participants with an assurance of confidentiality of every information given.

Results

Respondents' age ranged from 18 years to 60 years. Most of the respondents were within the age groups 35-54 years with a mean age of 38.54 ± 11.06 years and 41.94 ± 10.94 years for the intervention and control group respectively. There was no statistically significant difference in the age group distribution of the two groups ($\chi^2=4.7$, $P=0.323$). The proportion of married respondents were similar in both groups (92.5% in intervention and 87.1% in control group respectively). The proportion of those without any formal education was statistically significantly higher in the intervention group ($\chi^2=16.6$, $P<0.001$) however the mean respondents' children was similar in both groups ($t=1.387$, $CI=-0.254$ to 1.459 , $P=0.167$) (Table 1).

Table 1. Socio-demographic characteristics of the respondents (n=93).

Variables	Intervention Group, No (%)	Control Group, No (%)	Test statistics, P-values
Age (years)			
18-24	8 (8.6)	4 (4.3)	$\chi^2=4.7$; $P=0.323$
25-34	27 (29)	18 (19.4)	
35-44	26 (28)	29 (31.2)	
45-54	20 (21.5)	27 (29)	
≥ 55	12 (12.9)	15 (16.1)	
Mean age \pm SD	38.54 ± 11.06	41.94 ± 10.94	
Marital status			
Single	4 (4.3)	6 (6.5)	$\chi^2=1.55$; $P=0.461$
Married	86 (92.5)	81 (87.1)	
Widowed/Divorced	3 (3.2)	6 (6.5)	
Educational status			
No formal education	71 (76.3)	46 (49.5)	$\chi^{*}=16.6$; $P=0.001$
Primary level	15 (16.1)	23 (24.7)	
Secondary level	6 (6.5)	18 (19.4)	
Tertiary level	1 (1.1)	6 (6.5)	
Respondents' living children, mean \pm SD	4.73 ± 2.94	5.33 ± 2.97	$t=1.387$, $df=184$, $P=0.167$, $CI=-0.254$ to 1.459

χ^2 = Pearson chi square test; χ^2 * = Likelihood ratio chi square test.

Knowledge of cervical cancer

Only 9.7% of the respondents in the intervention group and 8.6% of the respondents in the control group knew that early onset of sexual intercourse is a risk factor for cervical cancer ($P=0.474$, Fisher's exact). 11.8% of respondents in both groups knew that having multiple sexual partners is a risk factor of cervical cancer ($\chi^2=3.237$, $P=1.000$). 7.5% of respondents in the intervention group and 5.4% of respondents in the control group knew that history of human papilloma virus infection was associated with cervical cancer ($\chi^2=5.116$,

$P=0.164$) (Table 2).

Post intervention: 55.7% of respondents in the intervention group and 9.2% of those in control group knew that early onset of sexual intercourse is a risk factor for cervical cancer ($\chi^2=250.655$, $P<0.0001$), 68.2% of those in intervention group and 16.1% of those in control group knew that having multiple sexual partners is a risk factor of cervical cancer ($\chi^2=249.912$, $P<0.0001$), 54.5% of those in intervention group and 13.8% of those in control group knew that vaginal bleeding after intercourse and weight loss were symptoms of cervical cancer ($\chi^2=257.63$, $P<0.0001$) (Table 3).

Uptake of Pap smear test

Awareness about Pap smear test was 1.1% in the intervention group pre-intervention and 7.5% in the control group ($P=0.064$, Fischer's exact), at post-intervention it was 34.1% in the intervention group and 5.7% in the control group ($\chi^2=21.966$, $P<0.0001$). Only one respondent in both groups (1.1%) had ever done Pap smear test before the study while post-intervention it was 3.4% of respondents in intervention group and it remained 1.1% in the control group (Fisher's exact, $P=0.621$) (Tables 4 and 5).

Table 2. Comparative knowledge of risk factors among respondents in both groups pre and post intervention.

Variables	Study group		Control group		Test statistics and P-values	
	Pre-intervention, n=93; No (%)	Post-intervention, n=88; No (%)	Pre-intervention, n=93; No (%)	Post-intervention, n=87; No (%)	Study Group	Control Group
Early onset of sexual intercourse	7 (7.5)	49 (55.7)	8 (8.6)	8 (9.2)	$\chi^2=58$, $P<0.0001$	$\chi^2=9$, $P=0.253$
Multiple sexual partners	11 (11.8)	60 (68.2)	11 (11.8)	14 (16.1)	$\chi^2=57$, $P<0.0001$	$\chi^2=11$, $P=0.027$
Family history of cervical cancer	8 (8.6)	48 (54.5)	12 (12.9)	8 (9.2)	$\chi^2=57$, $P<0.0001$	$\chi^2=12$, $P=0.10$
Human papilloma virus infection	7 (7.5)	25 (28.4)	5 (5.4)	8 (9.2)	$\chi^2=56$, $P<0.0001$	$\chi^2=10$, $P=0.125$
High parity	6 (6.5)	42 (47.7)	6 (6.5)	6 (6.9)	$\chi^2=58$, $P<0.0001$	$\chi^2=11$, $P=0.276$
Vaginal bleeding after menopause	6 (6.5)	48 (54.5)	11 (11.8)	12 (13.8)	$\chi^2=58$, $P<0.0001$	$\chi^2=9$, $P=0.109$
Weight loss	8 (8.6)	48 (54.5)	11 (11.8)	12 (13.8)	$\chi^2=57$, $P<0.0001$	$\chi^2=10$, $P=0.075$

χ^2 =McNemar Bowker test.

Table 3. Post intervention knowledge of cervical cancer among study and control groups.

Variables	Study group, n=88; No (%)	Control group, n=87; No (%)	Test statistics and P-values
Early onset of sexual intercourse	49 (55.7)	8 (9.2)	$\chi^2=250.655$, $P<0.0001$
Multiple sexual partners	60 (68.2)	14 (16.1)	$\chi^2=249.912$, $P<0.0001$
Family history of cervical cancer	48 (54.5)	8 (9.2)	$\chi^2=259.742$, $P<0.0001$
Human papilloma virus infection	25 (28.4)	8 (9.2)	$\chi^2=261.873$, $P<0.0001$
High parity	42 (47.7)	6 (6.9)	$\chi^2=256.429$, $P<0.0001$
Vaginal bleeding after menopause	48 (54.5)	12 (13.8)	$\chi^2=264.7$, $P<0.0001$
Weight loss	48 (54.5)	12 (13.8)	$\chi^2=257.63$, $P<0.0001$

χ^2 =Likelihood Ratio chi square test.

Table 4. Awareness about Pap smear test.

Awareness about Pap smear test	Study group		Control group		Test statistics and P-value
	Post-intervention; n=88, No (%)	Post-intervention; n=87, No (%)	Study group, n=88	Control group, n=87	
Yes	30 (34.1)	5 (5.7)			$\chi^2=21.966$, $P<0.0001$
No	58 (65.9)	82 (94.3)			

χ^2 =Pearson chi square test.

Table 5. Comparative Pap smear uptake pre and post-intervention.

Have you ever done Pap smear test?	Before intervention		Test statistics and P-value	After intervention		Test statistics and P-value
	Intervention group, n=93	Control group, n=93		Study group, n=88	Control group, n=87	
Yes, n (%)	1 (1.1)	1 (1.1)	$P=1.000^*$	3 (3.4)	1 (1.1)	$P=0.621^*$
No, n (%)	92 (98.9)	92 (98.9)		85 (96.6)	86 (98.9)	

*Fisher's exact.

The single most important reason for non-uptake of Pap smear test pre-intervention in both groups was *not being aware of the test* and finding was similar in both groups while post-intervention other significant contributing factors were; do not have time to do the test (15.9%), not having symptoms (13.6%), not feeling at risk of the disease (11.5%) ($P<0.0001$, Fisher's exact) (Table 6).

Discussion

This study aimed at evaluating the effect of an educational intervention on the knowledge of cervical cancer and subsequently the uptake of Pap smear test among market women. Most of the respondents were in the age range of 35-54 years with mean ages of 38.54 ± 11.06 years and 41.94 ± 10.94 years for respondents in the study and control groups respectively. This is unlike the trend seen in market women in two studies done in Lagos south western Nigeria¹⁵ where the peak age group of respondents was the 25-34 year age group closely followed by the 35-44 year age group.

Approximately nine out of every ten market women in both the intervention (92.5%) and control (87.1%) groups were married. This reflects the importance placed on the marriage institution particularly in this environment. This finding is the same with that of a similar study done in Owerri South eastern Nigeria among the general women populace where about 87% of women were married⁽³⁾ but much higher than that from a study in Lagos South western Nigeria where only about 72% of the respondents were married.¹⁵

The study groups were comparable in terms of knowledge of risk factors for cervical cancer because no statistically significant difference was seen in the proportion of respondents in each group that had good knowledge for each of the risk factors.

Respondents in both groups had very poor knowledge of risk factors for cervical cancer, only 9.7% had good knowledge in the intervention group and 10.8% in the control group at baseline. This is not encouraging considering that a study conducted in rural South Africa showed that 64% of respondents' knew at least one risk factor for cervical cancer.¹⁶ This was due to the institution of a National policy in South Africa (national guideline for cervical cancer screening) to improve the health of a vulnerable group of the population and implemented through its primary health care system since year 2000 with a goal to screen 70% of the target women within 10 years of initiation.¹⁶ Nigeria ought to have done better but in our present state we can at least learn from them.

In the same vein the respondents' knowledge of symptoms of cervical cancer was comparable at baseline as no statistically significant difference was seen in the proportion of respondents in each group who had good knowledge about symptoms of cervical cancer. The respondents equally had very poor knowledge of symptoms for cervical cancer, as only 10.8% of respondents in the intervention group and 12.9% of those in the control group had good knowledge.

A study done in Maiduguri among the general women populace revealed that a similar dismal proportion (less than 10%) had good knowledge about cervical cancer.¹⁷ An interventional study done among female secondary school teachers in Birnin kebbi, north western Nigeria also revealed that only few respondents had good knowledge about cervical cancer as only $17.1\pm6.3\%$ of respondents' in the intervention group and $14.1\pm6.4\%$ of respondents' in the control group had good knowledge of cervical cancer¹⁸ which is quite disturbing considering the vantage role of the teachers in educating the female students under their custody. Surprisingly, these secondary school teachers who are supposed to be

University graduates or at least NCE holders appear to have very poor knowledge about cervical cancer as corroborated by another study among secondary school teachers in Osogbo, Nigeria where only 12.8% of respondents had good knowledge about cervical cancer.¹⁹ This is worrisome because by implication secondary school students/leavers will not be properly educated about cervical cancer and the benefits of screening because their teachers are not well informed either.

Studies showing good knowledge about cervical cancer included those carried out among undergraduates and understandably female health care professionals as seen in Kano, Ibadan, Lagos, Umuahia, Nnewi and Port Harcourt.²⁰⁻²⁵ However studies done among undergraduates with good knowledge about cervical cancer were those that had medical students or students in the core sciences inclusive as respondents such as studies in Ibadan south west Nigeria and Nnewi south eastern Nigeria respectively.^{21,26} This appears to show that being educated to tertiary level isn't a sufficient criterion to be knowledgeable about cervical cancer.

The proportion of respondents who had ever done Pap smear test in both groups was 1.1% at baseline. This was similar to a study done among market women in Lagos, Nigeria where only 1.1% of women in the intervention group and 2.9% in the control group had ever done the test at baseline.¹⁵ Another study done among market women in Ibadan revealed an uptake rate for Pap smear test to be 5.2%.²⁷ A study done among female health workers in Ilorin, Nigeria revealed that only 3% of all respondents had ever been screened at least once previously.²⁸ Studies done among female health workers in different parts of Nigeria revealed surprisingly low uptake rates of cervical cancer; Nwobodo *et al.* in Sokoto revealed an uptake of 4.4%,²⁹ Udigwe in Nnewi revealed an uptake of 5.7%,²⁴ Anya *et al.* in Umuahia revealed an uptake of

Table 6. Reasons for lack of uptake of Pap smear test.

Why haven't you done Pap smear test?	Intervention group		Control group	
	Pre-intervention, n=92; No (%)	Post-intervention, n=85; No (%)	Pre-intervention, n=92; No (%)	Post-intervention, n=86; No (%)
Not feeling at risk of the disease	3 (3.3)	11 (12.5)	4 (4.3)	4 (4.6)
Cultural or Religious reasons	1 (1.1)	1 (1.1)	1 (1.1)	0 (0)
Don't have symptoms	3 (3.3)	12 (13.6)	2 (2.2)	2 (2.3)
Not aware of the test	84 (91.3)	42 (47.7)	80 (87)	75 (86.2)
Don't have time to do the test	1 (1.1)	14 (15.9)	5 (5.4)	5 (5.7)
Test is expensive	0 (0)	3 (3.4)	0 (0)	0 (0)
Fear of outcome of result	0 (0)	2 (2.3)	0 (0)	0 (0)

P=0.539, Fisher's exact; P<0.0001, Fisher's exact.

9%,²³ Addah *et al.* in Port Harcourt revealed an uptake of 12.8%.²⁵ All these studies have revealed an abysmally low uptake rate in a subset of the populace who are the most knowledgeable about the disease and in most cases have the screening services at their workplace.

The generally poor uptake of Pap smear test seen in studies involving the general women populace should not be surprising and can be variously explained as follows; firstly the female health workers who are supposed to encourage women to go for Pap smear test at every opportunity that presents itself (family planning clinics, ante-natal care clinics, general out-patient clinics etc.) have not availed themselves of it. Secondly, the process of health education goes from *being unaware, to being aware, to being knowledgeable, to getting the right attitude, right behaviour; to right habit and right practice*. These stages take variable amount of time and is individualized so the 6 months duration of the study may not have been sufficient for some respondents to have considered making Pap smear test a habit. Thirdly, a consideration that doing the test involves the respondent exposing their private part may have also affected their decision to have the test done.

Conclusions

This study showed the importance of educational interventions in increasing the knowledge about cervical cancer and Pap smear test however the uptake of Pap smear test remained low even after intervention. This may be explained by the fact that it takes people variable time frame to transit between the different stages of health education (from awareness through habitual practice). This calls for a need to re-inforce and sustain educational interventions to encourage this women to transit to habitual practice/ uptake of Pap smear test.

Limitations

Provision of subsidized and not free Pap smear test screening during the study.

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