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Effects of Educational Intervention on Nurses' Knowledge and Attitude Towards Providing Cervical Cancer Screening Information in Selected Health Facilities in Ibadan, Nigeria

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Abstract Cervical cancer is a major cause of death among women especially in developing nations. It can be prevented through screening yet many women are unaware of screening options. Nurses are in vantage position to provide cervical cancer screening (CCS) information and services especially in antenatal clinics. The purpose of this study is to evaluate the effects of an educational intervention (EI) on nurses' knowledge and attitude towards providing CCS information. This quasi-experimental study was conducted in eight health facilities in Ibadan, Nigeria. The facilities were randomly divided into intervention group (IG) and control group (CG). A total of 133 consenting nurses (60 in the IG and 73 in the CG) participated. Baseline data were collected using self-administered questionnaire. The nurses in the IG received the EI and both groups were administered with a post-test questionnaire after 6 months. Data were analysed using chi square and Student's *t* test at $p = 0.05$. Nurses' mean age was 41.7 years. Knowledge scores for the IG (11.8 ± 3.3) and CG (11.7 ± 3.3) were comparable at baseline ($p = 0.901$) but was significantly higher among nurses in the IG (14.63 ± 3.12) than CG (12.7 ± 3.5) at 6 months PI ($p = 0.01$). More nurses in the IG had high level of knowledge than CG. There was no significant difference in their attitude at baseline and at PI. There was a significant association between knowledge and attitude towards providing cervical cancer screening information ($p < 0.000$). Education improved knowledge of nurses on cervical cancer screening. Regular education programmes for nurses may result in improved counselling on major health issues like cancer.

Keywords Attitude · Cervical cancer · Educational intervention · Knowledge · Nurses

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Introduction

Cervical cancer, the second most common cancer among women, is a major cause of death with mortality data for all ages in a 5-year prevalence of 57,381(12.8%) for adult population proportions per 100,000 in Sub-Saharan Africa [1]. Cervical cancer is a preventable disease, if necessary measures are taken to avoid its occurrence. Mortality can be reduced if precancerous lesions are detected and treated early. Yet awareness, knowledge and uptake of cervical cancer have remained consistently low in this region [2–4]. The nurse as a professional has an important role to play in the early detection and prevention of cervical cancer and these roles are expanding. [5–7]. Nurses are expected to have more knowledge and to provide information about prevention services like cervical cancer but studies have documented that they do not provide necessary information on cervical cancer [8, 9]. Several studies have revealed gaps in nurses' knowledge of cervical cancer screening [9, 10]. Awodele et al. [10] among nurses in Lagos identified that the attitude of nurses towards cervical cancer prevention and screening uptake was generally good yet they were not providing information on cervical cancer prevention nor taking up screening services themselves. This study will determine the effect of cervical cancer screening educational

programme on the nurses' knowledge and attitude towards dissemination of cervical cancer screening information in selected health facilities in Ibadan, Nigeria.

Method

Study Design This interventional study utilized a quasi-experimental design with pre-test and post-test after 6-month follow-up.

Study Setting The study was carried out in eight selected health facilities in Ibadan, Oyo State, Southwest Nigeria. The facilities in the intervention group were Oniyanrin PHC, Alafara PHC, Jericho Nursing Home and General Hospital, Moniya, while the ones in the control group were Agbogbon PHC, Apete PHC, Adeoyo Maternity Hospital and St Mary's General Hospital, Eleta.

Study Population This comprised of nurses working in the maternal and child health units of the selected health facilities. The total population of nurses in the selected units of the facilities was 175.

Sampling The total population of nurses was used for the study. Only those nurses working in the selected units for over 1 year and were willing to participate were recruited for the study. A total of 133 nurses were recruited for the study with 60 in the intervention group and 73 in the control group.

Instrument Development The major instruments used for this study consisted of structured self-administered questionnaire designed from reviewed literature. The structured questionnaire (SQ) comprised of both open and close-ended questions and was used to elicit information on nurses' knowledge and attitude towards dissemination of cervical cancer screening information. The instrument was not based on a particular study but on information from various studies and was set to achieve the objectives of the study. The knowledge question items were 24 with various options while the attitude had 16 questions, presented on a 5 Likert scale format.

Reliability The structured questionnaire for pre- and post-evaluation survey was validated using Cronbach alpha reliability coefficient; the value obtained was 0.81 after a pilot study.

Intervention Intervention package for the programme was adapted from Nurses' Training Manual on Cervical Cancer Control by the World Health Organization [11]. This training manual aimed at sensitizing nurses on the need to recognize cervical cancer as one of the major reproductive health problems that needs to be prevented. The adapted package consists of five modules and one practical counselling and teaching session.

Ethics Ethical approval was obtained from the research ethics committees of the Oyo State Ministry of Health reference no. AD 13/479/85. The participants were duly informed about the procedure adopted in the study. The study was undertaken with total confidentiality and information provided by respondents was not disclosed to others. Involvement in the study was voluntary. Informed consent forms were attached to the copies of the questionnaire to ensure that consent was duly obtained from participants.

Data Collection Data was collected after obtaining necessary permission. Pre-intervention questionnaire was administered to the selected nurses in both IG and CG after baseline data collection; intervention in the form of scheduled seminars using the module on cervical cancer control was adopted for the nurses in the experimental group. The nurses in the IG had the seminar for 3 days, two sessions per day. Method of seminar delivery comprised of lectures using multimedia projector and practical session on counselling. Post-test was administered to both groups 6 months after the intervention.

Data Analysis The data collected from 133 respondents were found suitable for analysis at pre-intervention and post-intervention phases. Baseline and post-intervention data were compared to determine the effect of the intervention. The items on knowledge were scored and each correct answer had 1 mark to a maximum of 24 marks. Knowledge of nurses on cervical cancer was scored and categorized as follows: Low = ≤10, Fair = 11-15, High = ≥16 from a total of 24 correct answers. Strongly agree = 5, Agree = 4, Undecided = 3, Disagree = 2, strongly disagree = 1 where the answer is positive.

Where the answer is negative, strongly agree = 1, Agree = 2, Undecided = 3, Disagree = 4, strongly disagree = 5. There were 16 items testing attitude with maximum of 5 marks for each; thus, the maximum score obtainable was 80 and minimum acceptable level was 60. A score of 60 and above was taken as positive or good attitude while below that is poor attitude.

Descriptive and inferential statistics were employed for analysis. The results were presented in tables and figures. Chi square statistics was used for testing relationships between variables, while Student's *t* test statistic was used to test differences in mean values of quantitative variables at $p = 0.05$.

Results

Sociodemographic Characteristics of the Respondents

Table 1 shows the sociodemographic characteristics of the nurses. The majority (35.3%) of nurses were within 41–

Table 1 Sociodemographic characteristics of nurses in intervention group (IG) and control group (CG)

Variable	Intervention (%)	Control (%)	Total	χ^2	*p* value
Age (years)					
21–30	3 (5.0)	16 (21.9)	19 (14.3)	8.604	0.035
31–40	20 (33.3)	23 (31.5)	43 (32.3)		
41–50	23 (38.3)	24 (32.9)	47 (35.3)		
> 50	14 (23.3)	10 (13.7)	24 (18.0)		
Mean age 41.7 ± 9.1 years					
Marital status					
Single	5 (8.3)	11 (15.1)	16 (12.0)	1.412	0.235
Married	55 (91.7)	62 (84.9)	117 (88.0)		
Education level					
Diploma	47 (78.3)	60 (82.2)	107 (80.5)	0.312	0.577
Degree	13 (21.7)	13 (17.8)	26 (19.5)		
MCH experience (years)					
1–10	44 (73.3)	54 (74.0)	98 (73.7)	2.155	0.340
11–20	10 (16.7)	16 (21.9)	26 (19.5)		
> 20	6 (10.0)	3 (4.1)	9 (6.8)		

50 years of age at baseline. The mean age of nurses was 41.62 ± 9.08 years. Majority (88.0%) were married and 87.2% of them were Christians. A greater proportion (80.5%) of them had diplomas, that is registered nurse certificate.

Nurses' Level of Knowledge of Cervical Cancer

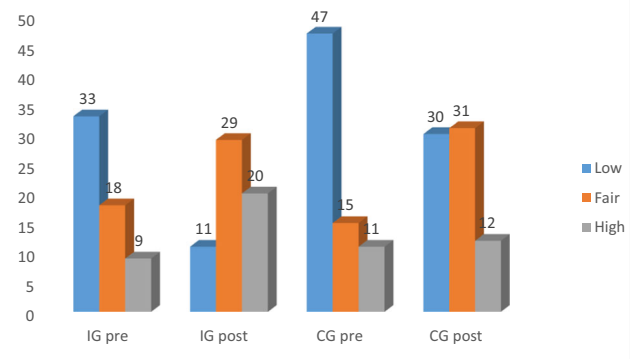
Nurses' responses to some knowledge questions on cervical cancer on Table 2 show some gaps in their knowledge at baseline as less than 25.0% in both groups knew about HPV vaccination for the prevention of cervical cancer, less than 35% identified VIA as a new screening test for cervical cancer. At post-intervention, there was over 50% improvement in most of the items for the respondents in the IG while CG did not improve much. The questions were from some of the critical issues on cervical cancer control covered during the study.

Figure 1 shows that in IG at baseline, 33 (55%) had poor knowledge level, 18 (30%) had fair knowledge while 9 (15%) had high level of knowledge but at PI 11 (26.8%) had poor knowledge, 29 (48.3%) had fair knowledge and 20 (33.3%) had high knowledge.

In the CG, 47 (64.4%) had low knowledge, 15 (20.5%) fair knowledge and 11 (15.1%) had high knowledge at baseline while at PI 30 (41.1%) had low knowledge, 31 (42.5%) moderate and 12 (16.4%).

Table 2 Responses on knowledge of cervical cancer screening tests, preventive and treatment options for pre-invasive cervical cancer

Baseline					Post-intervention			
	IG (%) *N* = 60	CG (%) *N* = 73	χ^2	*p* value	IG (%) *N* = 60	CG (%) N = 73	χ^2	*p* value
HPV vaccine for prevention of CC								
Yes	15 (25.0)	14 (19.2)	0.655	0.418	34 (56.7)	17 (23.3)	15.520	0.001
No	45 (75.0)	59 (80.8)			26 (43.3)	56 (76.7)		
Screening tests								
Visual inspection with Acetic Acid								
Yes	20 (33.3)	23 (31.5)	0.05	0.823	35 (58.3)	20 (27.4)	12.996	0.001
No	40 (66.7)	50 (68.5)			25 (41.7)	53 (72.6)		
Pap smear								
Yes	52 (86.7)	67 (91.8)	0.915	0.339	53 (88.3)	67 (91.8)	0.444	0.505
No	8 (13.3)	6 (8.2)			7 (11.7)	6 (8.2)		
Treatment of precancerous lesions								
Cryotherapy								
Yes	15 (25.0)	14 (19.2)	0.655	0.418	30 (50.0)	8 (11.0)	24.596	0.001
No	45 (75.0)	59 (80.8)			30 (50.0)	65 (89.0)		



Key: IG: Intervention Group, CG: Control Group, %: percentage, Pre: Pre-intervention, Post: Post-intervention

Fig. 1 Respondents' level of knowledge of cervical cancer at baseline and post-intervention

Table 3 indicates that there was no significant difference in the knowledge of nurses in the IG and CG, $t = 0.125$, $p = 0.901$ at baseline. But at PI, there was a significant difference, $t = 3.341$, $p = 0.01$.

Nurses Attitude Towards Dissemination of Cervical Cancer Screening Information

Table 4 shows the comparison of mean change in attitude score of nurses between intervention and control groups. There was no significant difference in attitude at IG ($t = 0.903$, $p = 0.368$) and CI ($t = 0.521$ and $p = 0.603$) both at baseline and post-intervention. The attitude score between study periods, at baseline the score was 67.95 ± 7.84 while at post-intervention, it was 70.30 ± 7.99, ($t = -2.763$, $p = 0.007$). The maximum score obtainable was 80 and minimum acceptable level was 60. A score of 60 and above was taken as positive attitude.

Association Between Respondents' Knowledge and Attitude Towards Cervical Cancer Screening

Table 5 shows that there was a significant association between nurses' level of knowledge and their attitude towards cervical cancer screening both at baseline ($\chi^2 = 6.445$; $p = 0.04$) and at PI ($\chi^2 = 15.695$, $p = 0.000$).

Discussion

This quasi-experimental study was carried out among 133 nurses in the selected hospitals in Ibadan using pre-test, intervention and post-test design.

Sociodemographic Characteristics of the Respondents

The nurses that participated in the study were mainly within 41–50 years of age group with mean age of 41.62 years ± 9.08 and majority (88.0%) were married; this is similar to findings by Arologun and Maxwell [9]. The demographic variables did not show significant difference between the groups except age. This shows that some facilities had older nurses than the others based on the recruitment patterns as they were not owned by the same level of government and was not within the control of the researcher. This was not seen as having negative influence as they were within similar age ranges.

Table 3 Mean difference between knowledge of respondents on cervical cancer screening

	Mean	S.D.	*t* test	*p* value	95% CI	
					Lower	Upper
Baseline						
Intervention ($N = 60$)	11.78	3.29	0.125	0.901	−1.056	1.198
Control ($N = 73$)	11.71	3.25				
Post-intervention						
Intervention ($N = 60$)	14.67	3.12	3.341	0.01	0.7915	3.089
Control ($N = 73$)	12.72	3.50				

S.D. standard deviation

Knowledge of Cervical Cancer Among Nurses in the Intervention and Control Groups

The major finding from this study was that nurses were fairly knowledgeable about cervical cancer though their knowledge improved with the study especially in the IG. There were also gaps in their knowledge in terms of new developments like human papillomavirus vaccination for prevention of cervical cancer, some newer screening methods and use of cryotherapy for the treatment of precancerous lesion. Various studies, Arologun and Maxwell [9], Awodele et al. [10] and Tchounga et al. [12] carried out among nurses showed average knowledge of cervical cancer; only a few had high level of

Table 4 Comparison of attitude score of nurses between intervention and control groups at baseline and post-intervention and between the study periods

Variable	Mean attitude score	*t* test	*p* value	95% CI	
				Lower	Upper
Baseline					
Experimental	68.63 ± 7.96	0.903	0.368	− 1.471	− 3.944
Control	67.39 ± 7.76				
Post-intervention					
Experimental	70.70 ± 6.98	0.521	0.603	− 2.034	− 3.489
Control	69.96 ± 8.76				
Study period					
Baseline	67.95 ± 7.84	− 2.763	0.007	− 4.025	0.667
Post-intervention	70.30 ± 7.99				

Table 5 Association between respondents' knowledge and attitude towards cervical cancer screening

	Attitude (baseline $N = 133$)				Attitude (post-intervention $N = 133$)			
	Good (%)	Poor (%)	χ^2	p value	Good (%)	Poor (%)	χ^2	p value
Knowledge								
Poor	36 (32.7)	14 (60.9)	6.445	0.04	14 (53.8)	7 (53.8)	15.695	0.000
Fair	47 (42.7)	6 (26.1)			54 (45.0)	3 (23.1)		
High	27 (24.5)	3 (13.0)			52 (43.3)	3 (23.1)		

knowledge of cervical cancer. It is expected that as professionals, they should provide information and should be highly knowledgable about cervical cancer issues. There was a significant increase in mean knowledge score at PI especially in the IG (14.6 ± 3.1 = 60.8%) than CG (12.7 ± 3.5 = 52.9%) compared to baseline IG (11.8 ± 3.3 = 49.1%) and CG (11.7 ± 3.3 = 48.8). The slight increase in CG is expected as they are professionals and having seen the questionnaire may have some interest in personal improvement but this did not make so much difference in CG knowledge. The effect of the intervention was seen more in the IG. Similarly, Nagamatsu et al. [13] found out from a study carried out among nurses in Japan that the knowledge score was significantly higher in the intervention group post-test.

The study equally showed there was a significant mean difference in knowledge score of the nurses that received the educational intervention and those that did not. This was consistent with findings from a study on knowledge dissemination and evaluation in a cervical cancer screening implementation programme in Nigeria by Miller et al. [14] which resulted in a significant gain in knowledge among the nurses who participated in the programme. Pawlowski et al. [15] documented that health education has been found to be effective in improving knowledge and prevention behaviour.

Nurses' Attitude Towards Providing Information

The self-reported attitude of nurses towards information dissemination was generally good both at pre- and post-intervention, but improved at PI. Nagamatsu, Natori, Yanai and Horiuchi [13] also found in their study that attitude score was significantly higher at post-test and follow-up test. Nurses with higher knowledge reported better attitude towards dissemination of cervical cancer information. Turner et al. [16] conveyed that increased confidence in nurses' ability to provide information and support for patients and to initiate discussion about emotional issues following an educational intervention programme. On the contrary, Dauer et al. [17] reported that, though a training intervention was effective for increasing cognitive knowledge, it was less effective at improving overall attitudes. Also, a qualitative study among women attending antenatal clinic in Ibadan by Ndikom and Ofi [18] showed that cervical cancer screening was not usually discussed by nurses in the clinics as most of the women verbalized that they had never heard about it. Similarly, a study on cervical cancer prevention knowledge, attitudes and practices of midwives in Côte d'Ivoire by Tchounga et al. [12] showed that only about a third of midwives routinely advised their clients about screening to their patients. Awodele [10] reported from a study carried out among nurses in Lagos, Nigeria, that though the respondents had good attitudes (89%) towards Pap smear, most of them have never done it before. This is similar to findings a study on nurse's knowledge and attitude regarding cervical cancer screening at a tertiary care hospital in India by Pegu et al. [19] which showed that close to 90% of the respondents had good attitude, yet none of them had their own screening. Being role models, no matter how they believe in screening if they do not uptake it themselves, it may be difficult to tell other women to go for cervical cancer screening. Giving women comprehensive information will enhance their likelihood of complying with follow-up instructions, treatment protocols and behaviours. This is necessary because screening is the major method of early detection of cervical cancer; thus, health care workers, who come into contact with women, should inform them about cervical cancer screening [20]. There is a need to retrain health workers on proper counselling skills for effective implementation of routine screening in cervical cancer prevention [21].

This study is limited based on the fact that it was based on self-report. There is need for an observational study using a check list to see if nurses have really improved in the act of providing cervical cancer screening information and counselling.

Implications for Practice

The nurse/midwife has the important role of taking care of women and meeting their reproductive health needs. Yildirimj et al. [22] opined that 'Screening and HPV vaccine present nurses with exciting opportunities as one of the most important roles of nurses is to increase the awareness of the public by fulfilling the caregiving, training and consulting roles, especially to the group under risk in the society'. To fulfil this role confidently, nurses and other health care

workers need to have constant update programmes on health-related issues.

As a matter of policy, there should be a structured programme in terms of health information provision relevant to each unit so that these are covered within a cycle of visits. All nurses must be able to provide adequate and current information on cervical cancer in order to match their good attitude with appropriate action.

Also, they need good communication and counselling skills in order to practice more effectively. As cervical cancer prevention programme is tending towards nurse-led interventions, there is need for the nurses to be abreast of current developments in the health care system.

Conclusion

Cervical cancer screening awareness and uptake is reported to be low in developing countries. Nurses are placed in strategic positions to provide information on cervical cancer and its preventive strategies. Yet their knowledge level was suboptimal at baseline but they had good attitude both at baseline and post-intervention. This study showed that there was a significant increase in knowledge at post-intervention in the experimental group. Attitude was good but increased slightly at post-intervention and there was a significant association between knowledge and attitude of the respondents.

Educational intervention is a useful tool for improving knowledge and attitude of nurses towards cervical cancer screening. Improved knowledge will likely empower the nurses to provide information on cervical cancer. Nurses at all levels of health care should be trained and re-trained periodically to provide this information to women. Government and health-related agencies should provide information and empower nurses to render cervical cancer services at all levels. Non-availability of screening services in most of the centres needs to be urgently addressed as it is a major barrier to screening uptake.

Strength and Weaknesses of the Study

The strength this study is that it has helped to fill some gaps in the nurses' knowledge of recent methods of prevention of cervical cancer.

The major weakness of this study is that it used self-report.

Implications for Further Research

Structured Direct observational study should be carried out to explore the attitude of nurses which was not really consistent with some anecdotal and published observations. Larger studies can be carried out using other centres.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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