

ORIGINAL ARTICLE

Umar SS. et al.. *Developing Capacity of Primary Health Centres in Screening, Early Diagnosis and Appropriate Referral of Cervical Cancer in a Low-Resource...*

DEVELOPING CAPACITY OF PRIMARY HEALTH CENTRES IN SCREENING, EARLY DIAGNOSIS AND APPROPRIATE REFERRAL OF CERVICAL CANCER IN A LOW-RESOURCE SETTING: A PILOT INTERVENTIONAL STUDY

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ABSTRACT

Background: Despite cervical cancer being preventable and treatable if detected early, it is predominantly characterised by late presentation with advanced disease in low-resource settings. This is due to a poor level of awareness of cervical cancer in the population. The Primary Health Centres (PHCs), which constitute 85.4% of all registered health facilities in Nigeria, serve as the first level of care for most patients, especially in low-resource settings. They represent potential for delivering effective interventions for cervical cancer prevention and control, if their capacities are to conduct community campaigns, health education, screening and early detection of symptoms.

Objective: The study aimed to develop the capacity of PHCs towards primary cervical cancer care through baseline assessments, training and monitoring of activities.

Methods: This study was a mixed-method study consisting of a cross-sectional and quasi-experimental design. The pre-interventional phase involved assessing knowledge of risk factors, symptoms and screening of cervical cancer by health care workers (HCWs) and patients in eight PHCs within Gusau metropolis. The intervention involved training 18 selected HCWs on cervical cancer risk factors, symptoms, treatment, screening and appropriate referral from four selected PHCs, for six consecutive weeks; while leaving the other four PHCs as controls without any training. The post intervention phase involved assessing knowledge of risk factors, symptoms, and screening for cervical cancer among the previously identified HCWs in the 8 PHCs. Furthermore, the 8 PHCs were followed up on activities for primary cervical cancer care at the end of the 6th and 13th week post-training.

Results: At baseline, there was poor knowledge of cervical cancer among the 210 patients surveyed attending PHCs. With only 30(14.3%), 4(1.9%) and 15(7.1%) of them having good knowledge of symptoms, risk factors and screening for cervical cancer. Following training of HCWs, there was significant improvement in knowledge of symptoms ($p=0.00078$), risk factors ($p<0.0001$), and screening ($p<0.0001$) for cervical cancer, among the HCWs compared to their pre-training levels. Furthermore, there were regular health education, identification of suspected cervical cancer cases or referrals from the PHCs in the intervention group within a follow-up period of 3 months post intervention, and none of these were found in the PHCs in the control group.

Conclusion: This pilot study shows promising tendencies that developing the capacity of PHCs towards cervical cancer primary care could be an effective strategy towards cervical cancer prevention and control in low-resource settings.

Keywords: Primary Health Centre, Cervical Cancer, Primary Cancer Care, Capacity Building

INTRODUCTION

The World Health Organisation (WHO) estimated that cervical cancer is the 4th leading cancer in incidence and mortality among women globally. It accounted for 660,000 new cases and 350,000 deaths in 2022. It is the commonest cancer in 25 countries and the leading cause of death in 37 countries, mainly in low and middle-income countries.^{1,2}

The low and middle-income countries carry the highest burden of incidence and mortality from cervical cancer, accounting for approximately 88% of incidence and 94% of deaths from cervical cancer globally.² However, developed countries in Europe and North America have much lower incidence and mortality from cervical cancer due to effective population-based screening that detects pre-cancerous lesions, administration

of Human Papilloma Virus (HPV) vaccines, and effective treatment of early disease.³ These laudable programmes that have been proven to reduce the incidence of cervical cancer are lacking in developing countries.⁴

The incidence of cervical cancer in Sub-Saharan Africa is over 10- fold higher than the elimination threshold set by the World Health Organization (WHO).⁴ Though most of the countries in this region, in a capacity survey by WHO, had National Cancer Control Plans (NCCPs) which included cervical cancer control, there were no organised programmes to meet the WHO Global Strategy towards Elimination of Cervical Cancer (the 90-70-90 targets that must be met by 2030).⁵

In Nigeria, cervical cancer accounted for 13,676 new cases and 7093 deaths in 2022, contributing 10.7% of new cases of cancer and 8.9% of deaths from cancer in Nigeria.

This made it the cancer with the highest incidence and mortality after breast and prostate cancers.⁶

Despite cervical cancer being preventable and treatable if detected early, many studies have found late presentation and advanced-stage diagnosis among patients as a common problem in low-income countries.⁷⁻¹¹ In an attempt to find out the predictors of delayed presentation with advanced diseases, several studies assessed the knowledge and attitude of women¹²⁻¹³ and healthcare workers^{14,15} in hospitals on cervical cancer with varied results. Healthcare workers in tertiary, specialist and general hospital settings¹⁵⁻¹⁸ generally had good knowledge of cervical cancer with a fair understanding of its screening methods compared to those in primary healthcare centres or rural hospitals.^{13,19} This implies that high-risk females who present to the primary healthcare centres (PHCs) miss out on opportunities for health education, screening services, detection of early symptoms and appropriate referral of cervical cancer. This is further compounded by poor knowledge of cervical cancer amongst rural women and those attending PHCs.^{12,20,21}

Though literatures are not available to assess the role of Primary Healthcare (PHC) in screening, early diagnosis and appropriate referral of cervical cancer patients, it is postulated that models of healthcare delivery that incorporate cancer care services like community health education, population-based screening, post-treatment and end-of-life care into primary healthcare systems might significantly improve cancer control compared to those limited to secondary and tertiary hospitals.²²⁻²⁶

In Nigeria, of the 40,621 registered health facilities, 34,672 were primary health centres, accounting for 85.4%.²⁷ This implies that the majority of the populace relies on such facilities as their immediate source of health counselling, education and primary care. While healthcare workers in tertiary, specialist and general hospital settings have good knowledge of cancer with a fair understanding of its screening, the same may not be applicable to those in primary healthcare centres or rural hospitals, though there seem to be little or no studies to support such.

Therefore, education and training of healthcare workers in the PHCs on cervical cancer screening, diagnosis, and appropriate referral would develop their capacity for conducting community awareness campaigns, health education, screening, early detection and appropriate referral of cervical cancer. This, if sustained and elaborated, would ultimately lead to a significant reduction in morbidity and mortality from cervical cancer, leading to its effective control.

This study is a mixed-method study, therefore aimed to assess knowledge of cervical cancer and practice of its screening among women (with no previous diagnosis of cervical cancer) attending PHCs, and among healthcare workers in the PHCs. Training sessions were conducted for HCWs of PHCs based on identified gaps, and they were followed up to assessed effect of training on their knowledge and practice of primary care of cervical cancer in the selected PHCs.

MATERIALS AND METHODS

Study Area

The study was conducted in Zamfara State, North-western Nigeria. The study site includes four (4) selected PHCs in Gusau Local Government Area (LGA) of Zamfara State, with geographic proximity to the Federal Medical Centre (FMC) Gusau, which is situated in the state capital. The FMC Gusau, which is a tertiary health centre offering specialised cancer care and serves as the apex referral centre for primary and secondary health facilities in the state. There are established Departments of Oncology, Obstetrics and Gynaecology and Community Medicine with specialists involved in cervical cancer management, training and education. The hospital is also a centre for research and training of resident doctors in Gynaecology. Zamfara State has 14 Local Government Authorities (LGAs) with 147 political wards spread across these LGAs. Each political ward has a Primary Health Centre (PHC). The study site, Gusau LGA, has 11 wards, each serviced by a PHC. Four of these PHCs were selected for the study using a random sampling technique. This is greater than 10% of the possible total wards to be selected (4 out of 11- 36%), as recommended by WHO for sampling facilities. While another four PHCs were used as controls without any interventions carried out.

Study Design

A mixed-methods design consisting of a cross-sectional survey of knowledge of cervical cancer among women attending PHCs and healthcare workers of the PHCs and practices (Aim 1); and a quasi-experimental component evaluating effects of training on HCWs knowledge of cervical

cancer and practice of primary cervical cancer care in their respective PHCs (Aims 2 and 3)

Study Population

The target audience includes HCWs in selected PHCs and female patients above 18 years attending these PHCs for primary care (with no previous diagnosis of cervical cancer).

Study Scope

The pilot study was conducted within Gusau LGA. Gusau LGA has 11 wards, with each ward having an apex PHC. Eight of these apex PHCs were selected for the study, based on security and convenience, while those within high insecurity areas were excluded. The study was conducted from 8th September 2023 to 20th August, 2024.

Study Eligibility

The inclusion criteria were all healthcare workers (HCWs) providing clinical services to women above 18 years in the primary health centres. Also, females above 18 years receiving care in the primary health centre were interviewed to assess their knowledge of cervical cancer.

Sample Size Determination and Sampling Technique

a) Baseline - female patients attending PHCs:

For assessing knowledge of cervical cancer among female patients above 18 years, the minimum sample size was calculated using:

$$n = \frac{Z^2 \cdot p \cdot q}{d^2} \quad \text{where:}$$

Z is the percentage point of the normal distribution corresponding to the required level of significance ($\alpha = 0.05$) = 1.96

p is the prevalence from a previous study, where 15%²⁹ of rural women in the study were aware of cervical cancer ($p = 0.15$)

q is the complimentary probability of **p**; $q = 1 - p$ ($q = 0.85$)

d is the precision/ margin of error of 5% (0.05)

Therefore, the minimum sample size, $n = 196$
Allowing for non- response of 10% of the minimum sample, the final sample size to allow for non- response is $196 \times 1.1 = 216$

b) Baseline - healthcare workers in PHCs:

Convenience sampling was used to administer the questionnaire to all the healthcare workers available and volunteering to participate in the study within the 8 selected PHCs. A total of 57 HCWs participated in the study.

c) Intervention- healthcare workers in PHCs: The 8 PHCs for the study were randomly assigned to two equal groups of 4 PHCs each: the **Intervention** and **Control** groups. Using purposive sampling, a total of 18 HCWs were selected from the 4 PHCs within the Intervention group (two PHCs had 4 participants selected, while two PHCs had 5 HCWs).

Baseline

Eight primary health centres (PHCs) in proximity to the Federal Medical Centre, Gusau, within Gusau Metropolis, were selected for the study. These include Damba,

Dr. Karima, Mareri, WCWC Kwata, Shagari, Kogo Bello, Ungwar Dallatu and Gada Biyu PHCs. An interviewer administered questionnaire over a period of 4 weeks across the 8 selected PHCs to assess the knowledge of female patients and healthcare workers on cervical cancer. Recruitment of participants was done using convenience sampling. A total of 210 female patients and 57 healthcare workers were recruited and interviewed. Also, a checklist was administered to all 8 PHCs assessing their practice of primary cervical cancer care, which includes health education, screening for cervical cancer, early detection of symptoms and referral of suspicious cases.

Intervention

The 8 PHCs were divided using simple randomisation into two equal groups: Intervention and Control groups. The Intervention group include Damba, Dr. Karima, Shagari, and Kogo Bello PHCs. While Mareri, WCWC Kwata, Ungwar Dallatu and Gada Biyu PHCs belonged to the Control group.

A total of 18 healthcare workers were selected from the intervention group, comprising 14 females and 4 males. A pre- training questionnaire was administered to assess their knowledge of risk factors, symptoms and screening of cervical cancer.

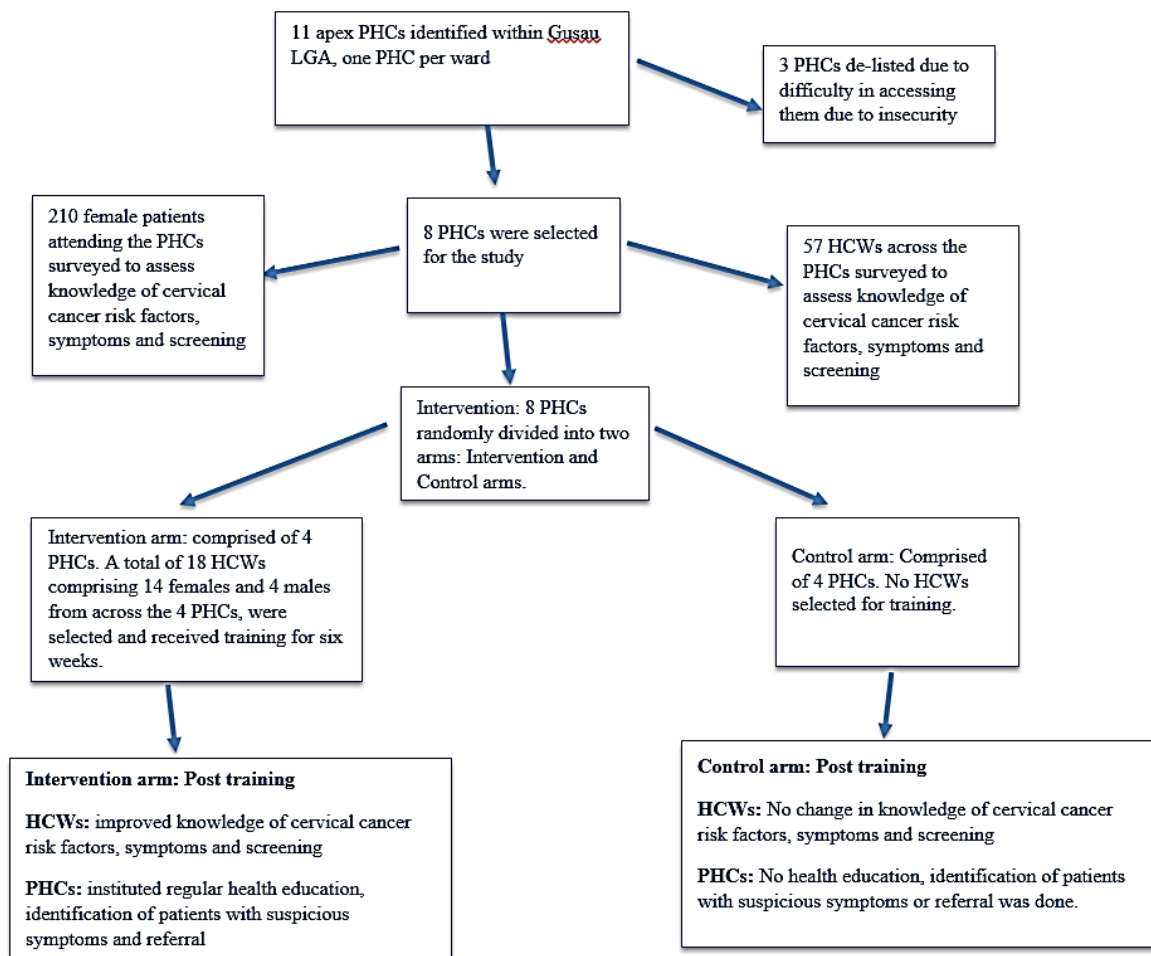


Plate 1. Flow chart showing detail of the study protocol

They were trained sequentially for a period of six weeks. The training comprised 90-minute lectures, practical demonstration of cervical cancer screening technique using Lugol's iodine and interactive sessions. These were conducted on a weekly basis for six weeks. The topics were presented using PowerPoint in the Department of Surgery Seminar Room, Federal Medical Center Gusau. The topics covered include:

Week/ Date	Topic
Week 1	Recruitment/ registration/ Introduction and orientation to the course
Week 2	Epidemiology, risk factors, symptom and signs of cervical cancer,
Week 3	Management, Treatment modalities, cure and supportive care for cervical cancer
Week 4	Prevention of cervical cancer: primary, secondary and tertiary prevention

- Week 5 Screening for cervical cancer: Aims, methods and precautions (including practical demonstration of screening using Lugol's iodine)
- Week 6 Practical approach to conducting health education, screening, early symptom detection and referral of cervical cancer at the PHC level, Post-test/ conclusion

Post- Intervention

A post-training questionnaire was administered to the trained healthcare workers following completion of training. A total of 16

out of 18 healthcare workers who participated in the training filled the questionnaire (two were excluded due to missing one or more training sessions). They were tasked with conducting health education on cervical cancer, identifying early symptoms and appropriate referral of suspicious patients. By the end of the 6th and 13th weeks post completion of training, the 8 PHCs were visited by the research team, and the checklist on primary care for cervical cancer was administered to each health facility.



Plate 2. Cross-section of participants and some facilitators following completion of the training in March 2024 at FMC Gusau, Zamfara state, Nigeria

Data Collection

The data on HCWs and female patients were collected using Kobo Toolbox, which is a secure online data collection application. It was interviewer-administered and included the following:

Biodata: Age, gender, marital status, occupation, place of residence, etc.

Questions on awareness of cervical cancer.

Questions on knowledge of risk factors, symptoms, screening and treatment of cervical cancer.

The data on PHC primary care on cervical cancer will be obtained using an adapted checklist.

Statistical Analysis

Data were analysed using Statistical Package for the Social Sciences (SPSS) software, version 25.0 (IBM Corp., Armonk, New York, USA). Continuous variables were summarised using mean and standard deviation (normal distribution) or median and interquartile range (non- normal distribution), while categorical data were summarised using tables.

A total of 7, 7 and 5 questions for risk factors, symptoms and screening of cervical cancer, respectively, were used to assess knowledge of cervical cancer. This was adapted from a previous study on knowledge of cervical cancer among healthcare workers in PHCs.¹⁴ The knowledge of symptoms, risk factors and screening was computed by assigning a score of 1 (or 2 for questions with multiple correct options, where a score of 2 is assigned to ticking all the correct options, and 1 assigned for ticking half or more correct options), and zero for wrong options. The total obtainable score for each of the knowledge of symptoms, risk factors and screening was 10. A total score of 0- 3 was classified as poor, 4- 6 was average, while 7- 10 was good knowledge. The proportion of HCWs and female patients with good knowledge of cervical cancer screening, risk factors and symptoms was presented using a bar chart.

Other observations were documented using simple tables or charts. The significant

difference in knowledge grade of HCWs was assessed pre- and post- training, of HCWs using McNemar's Chi-square test with the level of significance α set at 0.05.

Ethical Consideration

Ethical approval was obtained from the Health Research and Ethics Committee of the Federal Medical Centre Gusau, Zamfara State (FMC/2021/985/008/NNREC/TR/19/03/2026). Furthermore, the Zamfara State Primary Development Board adopted the ethical approval for HREC FMC Gusau and gave permission to use their PHC facilities for the study. Informed consent was obtained from every study participant before administering the questionnaire. None of the patients has had screening for cervical cancer previously.

RESULTS

Pre-Intervention

Female patients attending PHCs

A total of 210 female patients attending the selected PHCs were interviewed. Their mean age was 29.6 ± 8.2 years. Majority 184 (87.2%) of them were married. Only 84 (39.8%) ever heard of cervical cancer. Of those who ever heard of cervical cancer ($n=84$), over two-thirds 57 (67.9%) got their information through radio programmes. There was paucity of knowledge of cervical cancer, with only 30 (14.3%), 4 (1.9%), and 15 (7.1%) having good knowledge of symptoms, risk factors and screening of cervical cancer, respectively (Figure 1).

A total of 57 healthcare workers were recruited and interviewed. Their mean age was 28.4 ± 8.1 years. Most of them, 54 (94.7%) being community health extension workers (CHEWs) (Table 1). Other socio-demographic characteristics are outlined in Table 1.

Table 1: Socio-demographic characteristics of healthcare workers in PHCs (n= 57)

Variable	Frequency (%)
Age (years)	
< 20	12 (21.1)
21- 30	28 (49.1)
31- 40	12 (21.1)
41- 50	4 (7.0)
>50	1 (1.7)
Gender	
Female	49 (86.0)
Male	8 (14.0)
Marital status	
Married	48 (84.2)
Single	5 (8.8)
Divorced	2 (3.5)
Widowed	2 (3.5)
Cadre	
Community Health Extension Worker (CHEW)	54 (94.7)
Community Health Officer (CHO)	2 (3.5)
Nurse	1 (1.8)
Previous training on cervical cancer	
None	48 (84.2)
Yes	0 (0.0)
Not sure	9 (15.8)
Religion	
Islam	57 (100.0)

Only 8 (14.0%), 2 (3.5%) and 5 (8.8%) of the healthcare workers had good knowledge of symptoms, risk factors and screening of cervical cancer (Figure 2).

Most of the healthcare workers, 48 (84.2%), did not know the role of PHCs in primary cervical cancer care, and 50 (87.7%) did not know the appropriate physician to refer a patient with suspicion of cervical cancer.

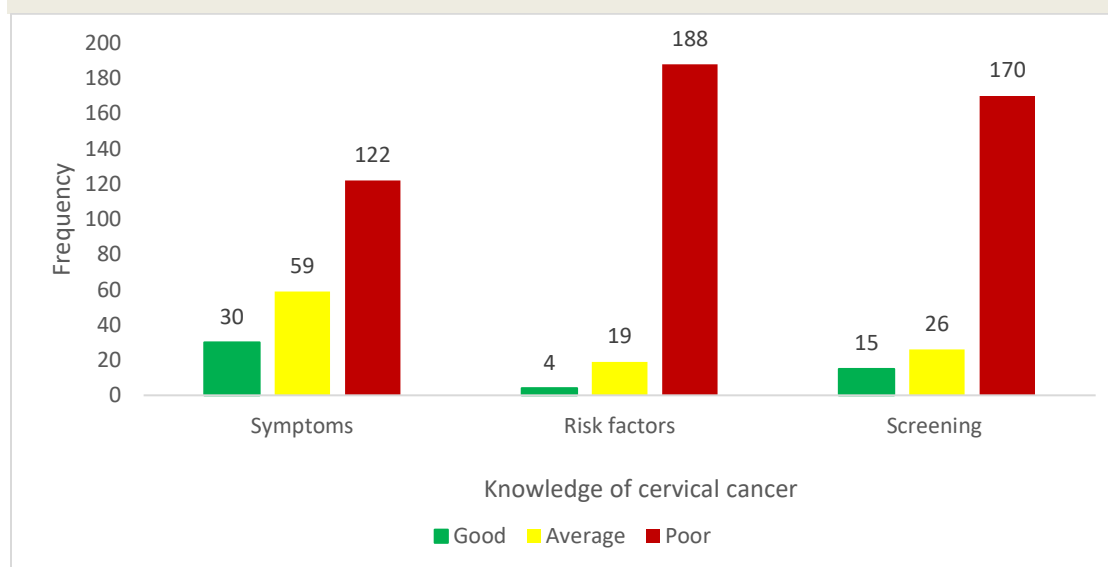


Figure 1: Knowledge of cervical cancer among female patients attending primary health centres (n=210)
Healthcare workers in PHCs

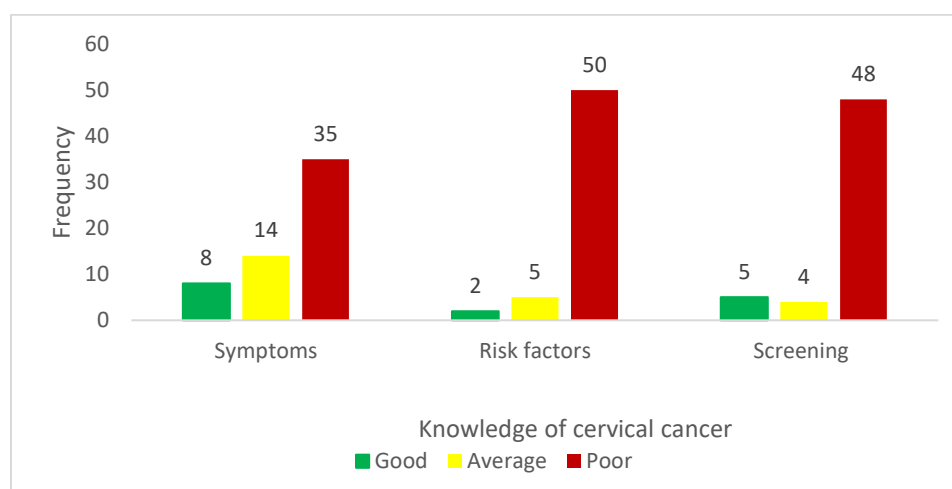


Figure 2: Knowledge of cervical cancer among healthcare workers in primary health centres (n= 57)

Primary Health Centre Survey

None of the 8 PHCs surveyed conducted regular health education on cervical cancer, nor did they have a record of presumptive diagnosis or referral of patients for cervical cancer within the last three months.

Post Intervention

Healthcare workers in PHC

Following training, 11 (68.8%), 14 (87.5%), and 16 (100%) of the healthcare workers had good knowledge of symptoms, risk factors and screening of cervical cancer (Figure 3).

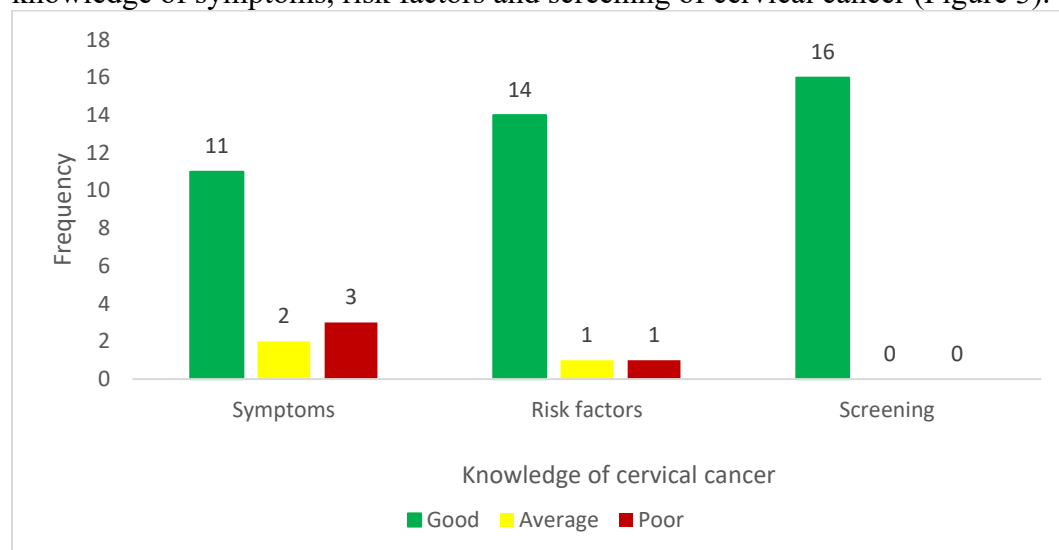


Figure 3: Knowledge of cervical cancer among healthcare workers in primary health centres (PHCs) in the intervention group (n= 16)

When compared to the pre-intervention values, there was significant improvement in knowledge of symptoms ($p= 0.00078$), risk factors ($p< 0.00001$), and screening ($p< 0.00001$) of cervical cancer among the HCWs who received training (Table 2).

Table 2: Comparison of knowledge of cervical cancer pre- and post-intervention for healthcare workers who received and completed training using McNemar's Chi-square test

Knowledge of cervical cancer	Frequency		Test statistics	
	Score grade		X ²	p value
	Good	Average/ Poor		
Symptoms				
Pre-intervention	1	15	11	0.00078
Post-Intervention	11	5		
Risk factors				
Pre-intervention	1	15	20	<0.00001
Post-Intervention	14	2		
Screening				
Pre-intervention	1	15	25	<0.00001
Post-Intervention	16	0		

Primary Health Centre Survey Post Intervention

None of the 4 PHCs in the control group surveyed conducted regular health education on cervical cancer, nor did they have a record of presumptive diagnosis or referral of patients for cervical cancer within three months after the training. However, the PHCs in the intervention groups had varying degrees of these primary cervical cancer care within the same period (Table 3).

Table 3: Cervical cancer primary care in PHCs in the intervention group within 3 months following training

PHCs in the intervention group	Health education		Patients with suspicious symptoms diagnosed	Patients with suspicious symptoms referred
	Frequency	Rate	Frequency	Frequency
Dr Karima	10	2- weekly	8	6
Kogo Bello	15	Weekly	6	3
Damba	11	2- weekly	5	2
Shagari	16	Weekly	9	4

DISCUSSION

The study found a low level of knowledge of cervical cancer symptoms, risk factors and screening among patients attending primary health care, which is a good reflection of the level of knowledge at the community level. This was in keeping with similar studies in Southwest and Southeast Nigeria,^{30,31} and other low-resource settings in Saudi Arabia,³² India,³³ and Thailand.³⁴ The findings of this study were in keeping with similar studies from low and middle-income countries, reflecting low knowledge, which has been observed as a significant barrier to effective cervical cancer prevention and control.³⁵ This finding reflects inadequate penetration of the education campaign to women who generally, are potentially at risk of coming down with cervical cancer. For effective cervical cancer control, young girls and women must be targeted through community mobilisation, health education and counselling by trained healthcare workers.³⁶ Thus, the closest

healthcare workers to these targets are those providing care within the primary health centres.

The study equally found a low level of knowledge of symptoms, risk factors and screening of cervical cancer, among healthcare workers in primary health centres who were predominantly community health extension workers (CHEWS). Furthermore, there were no baseline primary cervical cancer activities like health education, identification of early symptoms and appropriate referral for cervical cancer. Similar studies found a lack of sufficient knowledge among the health workers at the PHC on cervical cancer.^{37,38} The observed pattern implies that these health care workers do not have sufficient knowledge of cervical cancer, hence were ineffective in providing primary cervical cancer care in the PHCs. This is due to lack of training on such roles, and a lack of basic structure or programmes to offer primary cervical cancer care.^{37,38}

Furthermore, these health care workers were at risk of recirculating misconceptions about cervical cancer to the general population and misdirecting patients presenting with potentially early symptoms.

The intervention was simple, innovative, and cost-effective. This was rolled into a 6-week module which included didactic lectures, interactive sessions and practical sessions on cervical cancer screening using Lugol's iodine. The immediate effects included significant improvement in knowledge of trained healthcare workers, and their practice of primary cervical cancer care in their PHCs, which include health education, detection of early symptoms and appropriate referral. This study was in tandem with an intervention study with a broader scope, conducted in Liberia, South Africa and Grenada.³⁹ Where nurses in rural hospitals were trained on cervical cancer, including risk factors, symptoms and screening methods.³⁹ The trained nurses reported improved knowledge of cervical cancer and skills of its screening.³⁹ Over a period of one year, the 79 trained nurses across the studies screened over 1600 women for cervical cancer.³⁹

The global strategy for cervical cancer elimination developed by the World Health Organisation aims to eliminate cervical cancer as a disease of public cancer by 2030 by reducing the cases globally to <4 cases per 100,000 women.⁴⁰ The strategy to achieve this aim includes vaccination of 90% of girls by 15 years; screening of 70% of women by 35 and 45 years; and treatment of 90% of women with pre-cancerous or cancer lesions.⁽⁴⁰⁾ This framework was well received, especially in low-income countries like Nigeria. However, many low-income countries, including

Nigeria, struggle to implement this strategy due to many factors, including finance and weak healthcare structure.⁴⁰ In addition, successful implementation of these strategies will require acceptance and uptake of the services provided, on a large scale, by the community. In low-resource settings like Nigeria, the recent implementation of HPV vaccination using the primary health centres as focal points was a good development.^{41,42} However, the roles of the primary health centres, in this regard, can be expanded by establishing dedicated cancer units that will provide primary cervical cancer care, which includes health education, screening, detection of early symptoms and appropriate referral of cervical cancer.

It will be difficult to achieve any significant cervical cancer control if the majority of the women at risk have poor knowledge of cervical cancer, and if the primary healthcare worker does not have the basic minimum knowledge and skills to institute primary cervical cancer care at the PHC level.^{43,44} Other endemic diseases like malaria, HIV, tuberculosis, as well as obstetric care, have achieved great successes in strengthening their control by advocating and implementing strategies and programmes at the primary healthcare levels.⁴⁵⁻⁴⁸ This index study shows promising tendencies of effective utilisation of PHC towards prevention and control of cervical cancer. This study may be expanded to give more insight into the practical implementation of the global strategy for the elimination of cervical cancer in low-resource settings, with PHCs as a fulcrum.

Limitations of the study

This study is not without several limitations. First, it is a pilot study limited to only 8

primary health centres; thus, it has limited generalizability. Second, the statistical methods used did not account for clustering of the PHCs, which may be a potential source of bias, exaggerating type 1 error. Furthermore, the pre and post-test assessment for the HCWs in the control group, which would have given more balance to the effectiveness of training in the intervention group, was not done. Also, this study was short-lived with only 3 months of follow-up; hence, the sustainability of primary cervical cancer care and the effect on knowledge, attitude and perception of the women in the community, who are the ultimate target of the intervention, could not be assessed. Finally, the funding of the project was limited, hence could not

procure instruments and reagents for screening of cervical cancer in the PHCs selected for intervention.

CONCLUSION

The results from this pilot study show promising tendencies that developing the capacity of PHCs towards cervical cancer primary care could be an effective strategy towards cervical cancer prevention and control in low-resource settings. Therefore, more detailed studies should be conducted to ascertain the feasibility and cost-benefit analysis of utilising PHCs as a fulcrum for cervical cancer prevention and control programmes in low-resource settings.

RECOMMENDATIONS

Stakeholder	Recommendation
National Institute for Cancer Research and Treatment (NICRAT) and National Primary Healthcare Development Agency (NPHCDA)	• Should escalate the study to involve more primary health centres across the country. This will provide the external validity lacking in this study. • Should collaborate and establish cancer units in primary health centres that will provide primary cancer care as routine activities
State Governments and Local Government Authorities	• Should fund procurement of facilities and capacity development of healthcare workers in the primary health centers on cervical cancer primary care services.
Communities and Organised Societies	• Should collaborate with primary health centres towards improved cervical cancer advocacy, especially in remote areas relying mainly on primary health centres for health care.

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