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Impact of Training Programme on Knowledge and Perception of Primary Health Care (PHC) Workers on Nutrition Component of Safe Motherhood Initiative in South-West Nigeria

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Abstract

One of the core components of Safe Motherhood Initiatives (SMI) is nutrition, yet only few studies have considered this adequately. The goal of this intervention study was to evaluate the effect of training programme on knowledge and perception of PHC health workers on nutrition components of SMIs. The study was quasi-experimental involving two groups of 30 PHC health workers each purposively selected from Egbeda Local Government Area (LGA) (experimental group-EG) and Ido LGA (control group-CG). The two groups completed validated questionnaire at baseline. Knowledge and perception of nutrition components of SMIs were assessed using 42-point and 28-point scales respectively. Knowledge and perception gaps identified during the baseline survey were used to design module for training programme for the EG. Post-intervention assessment was conducted immediately and one month after the training among the two groups. These showed that knowledge scores at baseline, immediate post-intervention and one month post-intervention were 12.6±2.9, 36.9±3.6 and 39.9±1.7 respectively ($p<0.05$) and 12.2±2.8, 13.7±2.8 and 13.6±2.5 respectively in the CG ($p>0.05$). Difference in knowledge scores between the EG and CG groups at the different stages of assessment was significant ($p<0.05$), except at baseline. Perception scores at baseline, intervention and one month post-intervention for EG were 20.2±4.8, 21.1±2.3 and 23.0±3.4 respectively compared with 19.2±3.8, 20.3±3.6 and 22.4±4.3 in CG respectively ($p>0.05$). Training improved knowledge of health workers' but had insignificant effect on perception of nutrition components of SMIs. The PHC health workers have right perception of nutrition components of SMIs but lack adequate knowledge. There is need for continuous training of health workers' on nutrition components of SMI to enhance maternal and child care, especially at the PHC level.

Keywords: Safe Motherhood Initiative; Nutrition component; Training; Primary Health Workers

Introduction

The global campaign to reduce maternal mortality was launched in 1987, when three United Nations agencies— United Nations Population Fund (UNFPA), the World Bank, and World Health Organization (WHO) —sponsored the international Safe Motherhood Conference in Nairobi, Kenya. The event aimed to raise awareness about the numbers of women dying each year from complications of pregnancy and childbirth, and to challenge the world to intervene [1]. At that time the number of maternal deaths worldwide was estimated to be at least 600,000 each year - with 99% of deaths occurring in the developing world. In spite of the promises and good expectations associated with SMI when founded, the programme is yet to witness a quantum leap in progress to reduce maternal challenges. This may be related to neglect of some vital components in the planning of which nutrition is fundamental [15]. In Nigeria, maternal mortality ratio is put at 545 maternal deaths per 100,000 live births [2]. Safe Motherhood refers to a situation in which no woman going through the physiological processes of pregnancy and childbirth suffers any injury or loses her life or that of the baby [3].

Most maternal deaths occur in the developing world; making maternal mortality the health statistics with the largest disparity between developed and developing countries [4]. The consequences of malnutrition, in all its forms (both macronutrients and micronutrients) can be seen in poor birth outcomes and poor breast-feeding and other infant feeding and care practices.

Rapid and progressive physiological changes that occur during pregnancy require supply of adequate nutrients, especially some micronutrients that are needed during the first trimester to help in ensuring in cell division and multiplication. Women in developing countries may benefit from multiple-micronutrient prophylaxis in pregnancy, but the underlying basis and rationale for changing from supplementation with iron and folate to supplementation with multiple micronutrients has not been debated in the context of existing programme objectives [16]. In Nigeria, iodine deficiency among pregnant women causes 3% of children born to suffer cretinism, 10% moderate to severe mental retardation, 87% mild intellectual impairment and 20% goitre while vitamin A deficiency accounts for 300,000 child deaths [5,6].

The components of SMI include pre-conception care, which consists of information and services given to an individual or couple who intend to biologically raise a child. It also includes ante-natal care and education given to a woman during pregnancy. The purpose is to help achieve optimal maternal and infant outcome as much as possible. In addition, SMI considers post-partum care, which encompasses management of the mother, newborn, and infant during the first few days after delivery up to the mother's post-partum check-up with her health care provider. Immediate breastfeeding after birth has been found to help mothers by stimulating the contractions of the uterus that protects against severe bleeding and it equally protects infants by providing nutrients and essential immunities from disease [17].

Nutrition component of safe motherhood concept is considered from four perspectives, which include food intake, basic hygiene and sanitation, health status and access to evidence-based nutrition information. For the purpose of this study, more emphasis is laid on food intake as one of the key components of SMI. Optimal nutritional status prior to pregnancy enhances the likelihood of conception and helps ensure a healthy pregnancy outcome. Access to and consumption of iodized salt in order to control iodine deficiency disorders is of utmost important to SMI [7]. Maintenance of a healthy body weight, using Body Mass Index (BMI) between of 18.5–24.9 as cut-off point before pregnancy is required for every woman of reproductive age. Reduce workload and rest to conserve energy and prevention of diseases and infection such as diabetes, hypertension that may be transmitted to offspring are all the essential nutrition component of SMI [7].

Rather than focusing exclusively on the prenatal period, it is important to describe a life cycle approach to improving maternal nutrition, which goes beyond the traditional provision of nutrition services during pregnancy, by addressing risk factors that are present well before pregnancy, even before childbearing age, which include nutrition of girl and adolescent child [18]. Potential risks of childbearing can be greatly reduced if a woman is healthy and well-nourished before becoming pregnant, if she has a health check-up by a trained health worker at least four times during every pregnancy, and if the birth is assisted by a skilled birth attendant such as a doctor, nurse or midwife [8]. In Nigeria, more than half of women who had a live birth received antenatal care from a health professional (58%); 23% from a doctor, 30% from a nurse or midwife and 5% from an auxiliary nurse or midwife. Thirty-six percent of mothers did not receive any antenatal care [2].

Adequate and relevant knowledge of nutrition is required to prevent complication during delivery. Unguided supplementary feeding could increase risk of obstructed labour, especially among primiparous women <1.5 m in height and should be avoided when there is poor access to obstetric care [19]. Training of health professionals has been found to improve significantly the course of safe motherhood initiative. Therefore, exposing them to basic training in nutrition components of SMI will go a long way in ensuring the success of the initiative [20]. Presently, there is dearth of information on knowledge of nutrition component of SMI among health workers at the PHC level in Nigeria. The objective of this study was to investigate the impact of training on knowledge gaps of health workers on nutrition component of SMI.

Material and Methods

Study design and Location

This was an intervention study, with a quasi- experimental design. Two groups of professionally similar primary health care workers were identified and purposively selected from two different communities, namely: Egbeda and Ido. Egbeda and Ido LGAs share similar characteristics, consisting of both urban and rural communities. These were designated as the Experimental Group (EG) and Control Group (CG), respectively. Both the EG and CG consisted of 30 consented primary health care workers each from Egbeda and Ido PHCs in Oyo State of Nigeria. An interviewer-administered semi-structured questionnaire was used to collect baseline information, which included 42-point and 28-point scales to assess knowledge and perception. The scales were developed from nutrition variables under the Essential Nutrition Actions by USAID [21]. Knowledge score was categorized as poor (0-20) and good (>20) while the perception score was classified as wrong (0-13) and right (>13). The Principal Investigator and Co-investigator were involved in the administration of the questionnaire. The instrument was developed by both investigators and was equally pre-tested together. Interviewer's variability in questionnaire administration was not observed as the two interviewers worked together. A training guide was developed based on the gaps identified from the survey conducted on the two groups, using the Academy for Educational Development standard [9]. The experimental group received a two-day training, using the training guide as intervention tool while the control group received placebo training on HIV/AIDS prevention, which was not directly related to the focus of intervention. Once a week, a reminder text message was sent to the experimental group for a month post-training to serve as reinforcement to the training programme. However, at the end of the study, the control groups were also trained based on principle of ethics. At the end of the two trainings, both groups were subjected to immediate and one-month post-training evaluation.

Validity and reliability of instrument

Review of relevant literature, comments from experts in public health disciplines were conducted for face and content validity. The questionnaire was pre-tested for reliability and the Cronbach Alpha value was 0.76 after adjustments were made on the initial draft.

Data Management and Analysis

The questionnaire was sorted, cleaned and coded, using coding guide. Data were subsequently entered into the computer, using SPSS Version 15.0 for analysis. Data were analyzed using descriptive statistics (mean, percentage, frequency etc) and t-test was run using Wilcoxon's test because the sampling was non- parametric.

Ethical Consideration

The study followed the ethical principles guiding the use of human participants in research. Ethical approval was sought from the ethics review committee of University College Hospital, Ibadan, Nigeria.

Results

Socio-demographic characteristics for the experimental and control groups

Socio-demographic characteristics of the participants are presented in Table 1. Age of the experimental and control groups were 46.0±4.0 and 47.6±5.5 years respectively. More of the participants (86.7%) were within the 41-60 years age bracket among the experimental group and 80.0% were within the same age bracket among control group. All the participants were female in both groups. All the respondents in both groups were Yoruba and claimed to have tertiary level of education. A majority of the respondents (80.0%) were Community Health Worker, 20.0% were Nurse among the experimental group while 93.3% were Community Health Worker and 6.7% were Nurse among the control group. Majority (93.3%) of experimental and control (96.7%) groups had been providing health care services for ≤ 20 years.

Characteristic	Category	Experimental(N=30)		Control(N=30)	
		N	%	N	%
Age group (yrs)					
20-40		4	13.3	6	20.0
41-60		26	86.7	24	80.0
Sex	Female	30	100.0	30	100.0
Ethnicgroup	Yoruba	30	100.0	30	100.0
Educational status	Tertiary	30	100.0	30	100.0
Current qualification	Nurse	6	20.0	2	6.7
	Community Health Worker	24	80.0	28	93.3
Years of Service	0-20	28	93.3	29	96.7
	21-40	2	6.7	1	3.3

Table 1: Socio-demographic characteristics of experimental and control groups at pre-intervention.

Knowledge of Nutrition Component of Safe Motherhood Initiatives at Pre-test among the Experimental and Control Groups

Table 2 shows participants' knowledge of nutrition component of SMI at pre-test. None from both the experimental and control groups had good knowledge of SMI. However, 28 (93.3%) participants in the experimental and 25 (83.3%) in the control group had poor knowledge of what SMI entails while 2 (6.7%) in the experimental group and 5 (16.7%) in the control group had no knowledge of such. No member of both groups had good knowledge of two components of SMI but 19 (63.3%) participants in the experimental group compared to 15 (50.0%) in the control group had poor knowledge of component of SMI. Similarly, in all the other variables listed in the table, no members of the two groups had good knowledge of all nutrition-related component of SMI at pre-test. However, data presented show that some of them (both in the experimental and control groups) had poor knowledge of some of the listed variables.

Knowledge of the Nutrition Component of Safe Motherhood Initiative at Post-test among the Experimental and Control Groups

Table 3 shows participants' knowledge of nutrition component of SMI at post-test. Sixteen (53.3%) participants in the experimental group and none in the control group had good knowledge of what SMI is all about. However, 14 (46.7%) participants in the experimental and 27 (90.0%) in the control groups still had poor knowledge of the same subject matter while none of the participants in the experimental group and 3 (10.0%) in the control group had no knowledge of such after the training. Similar trends were observed in all the other variables tested as the data are presented in Table 3.

Variables	Response basedon the Content of the TrainingModule	Experimental		Control	
		N	%	N	%
Understanding of safe motherhood	Good	0	0.0	0	0.0
	Poor	28	93.3	25	83.3
	Nil	2	6.7	5	16.7
List 2 components of safe motherhood initiative	Good	0	0.0	0	0.0
	Poor	19	63.3	15	50.0
	Nil	11	36.7	15	50.0
State 2 nutrition related information that should be given to women of reproductive age at preconception care	Good	0	0.0	0	0.0
	Poor	20	66.7	16	53.3
	Nil	10	33.3	14	46.7
Mention 3 food sources of Vitamin A	Good	0	0.0	0	0.0
	Poor	23	76.7	17	56.7
	Nil	7	23.3	13	43.3
List 2 specific nutrients (micronutrients) required at the first trimester of pregnancy	Good	0	0.0	0	0.0
	Poor	15	50.0	11	36.7
	Nil	15	50.0	19	63.3
Mention 3 food sources of these specific nutrients listed in question 5 above	Good	0	0.0	0	0.0
	Poor	24	80.0	20	66.7
	Nil	6	20.0	10	33.3
Mention 2 groups of people that are vulnerable to under-nutrition	Good	0	0.0	0	0.0
	Poor	19	63.3	16	53.3
	Nil	11	36.7	14	46.7
State 2 benefits of family planning services in relation to safe motherhood concept	Good	0	0.0	0	0.0
	Poor	11	36.7	12	40.0
	Nil	19	63.3	18	60.0
Mention 2 ways that women of child-bearing age can be economically empowered	Good	0	0.0	0	0.0
	Poor	13	43.3	11	36.7
	Nil	17	56.7	19	63.3
Mention 2 ways of helping pregnant and lactating women reduced their workload to reduce calorie (nutrient) depletion	Good	0	0.0	0	0.0
	Poor	14	46.7	10	33.3
	Nil	16	53.3	20	66.7

Good: the participant was able to give correct response to the question as stated in the training module/guide
Poor: the participant responded faintly to the question as stated in the training module/guide
Nil: the participant could not respond at all to the question asked

Table 2: Knowledge of Nutrition Component of SMI among Experimental and Control groups at Pre-Test (N=30)

Variables	Response based on the Content of the Training Module	Experimental		Control	
		N	%	N	%
Understanding of safe motherhood	Good	16	53.3	0	0.0
	Poor	14	46.7	27	90.0
	Nil	0	0.0	3	10.0

Variables	Response based on the Content of the Training Module	Experimental		Control	
		N	%	N	%
List 2 components of safe motherhood initiative	Good	27	90.0	0	0.0
	Poor	3	10.0	17	56.7
	Nil	0	0.0	13	43.3
State 2 nutrition related information that should be given to women of reproductive age at preconception care	Good	16	53.3	0	0.0
	Poor	14	46.7	19	63.3
	Nil	0	0.0	11	36.7
Mention 3 food sources of Vitamin A	Good	24	80.0	0	0.0
	Poor	6	20.0	19	63.3
	Nil	0	0.0	11	36.7
List 2 specific nutrients (micronutrients) required at the first trimester of pregnancy	Good	27	90.0	0	0.0
	Poor	3	10.0	16	53.3
	Nil	0	0.0	14	46.7
Mention 3 food sources of these specific nutrients listed in question 5 above	Good	25	83.3	0	0.0
	Poor	5	16.7	22	73.3
	Nil	0	0.0	8	26.7
Mention 2 groups of people that are vulnerable to under-nutrition	Good	26	86.7	0	0.0
	Poor	4	13.3	19	63.3
	Nil	0	0.0	11	36.7
State 2 benefits of family planning services in relation to safe motherhood concept	Good	21	70.0	0	0.0
	Poor	9	30.0	13	43.3
	Nil	0	0.0	17	56.7
Mention 2 ways that women of child-bearing age can be economically empowered	Good	16	53.3	0	0.0
	Poor	14	46.7	15	50.0
	Nil	0	0.0	15	50.0
Mention 2 ways of helping pregnant and lactating women reduced their workload to reduce calorie (nutrient) depletion	Good	23	76.7	0	0.0
	Poor	7	23.3	13	43.3
	Nil	0	0.0	17	56.7

Table 3: Knowledge of Nutrition Component of SMI among Experimental and Control groups at Post-Test (N=30)

Knowledge of the Nutrition Component of Safe Motherhood Initiative at One Month Follow up (Post-test) among Experimental and Control Groups

Table 4 shows participants' knowledge of nutrition components of safe motherhood initiatives at one month follow up (post-test). Twenty-three participants (82.1%) in the experimental group and none in the control group had good understanding of safe motherhood; five participants (17.9%) in the experimental group and 25 (83.3%) in the control group had poor understanding of safe motherhood. Twenty-seven participants (96.4%) in the experimental group and none in the control group could mention two nutrition components of SMI. Twenty-two participants (78.6%) in the experimental group and none in the control group were able to mention two nutrition-related information that should be given to women of reproductive age at pre-conception care. Six participants (21.4%) in the experimental group compared to 18 (60.0%) in the control group had poor knowledge. Twenty-seven participants (96.4%) in the experimental group and none in the control group were able to mention three food sources of vitamin A; only one participant (3.6%) in the experimental group compared to 19 (63.3%) in the control group were able to mention only one food source of vitamin A. Twenty-five participants (89.3%) in the experimental group and none in the control group were able to list two specific micronutrients required during the first trimester of pregnancy; three participants (10.7%) in the experimental group compared to 17 (56.7%) in the control group could mention only one specific micronutrient required during the same period. Twenty- six participants (92.9%)in the experimental group and none in the control group were able to mention three food

sources of the specific micronutrients required during first trimester of pregnancy; only two participants (7.1%) in the experimental group compared to 21 (70.0%) in the control group were able to mention one of such food sources. Twenty-six participants (92.9%) in the experimental group and none in the control group were able to mention two groups of people who are vulnerable to under-nutrition; two participants (7.1%) in the experimental group compared to 18 (60.0%) in the control group were able to mention only one vulnerable group of people. Twenty-three participants (82.1%) in the experimental group and none in the control group were able to state two benefits of family planning services in relation to SMI; five participants (17.9%) in the experimental group compared to 13 (43.3%) in the control group were able to state one of the benefits. Twenty-four participants (85.7%) in the experimental group and none in the control group were able to mention two ways women of child-bearing age can be economically empowered; four (14.3%) participants in the experimental group compared to 16 (53.3%) in the control group were able to mention only one of the ways. Twenty-six participants (92.9%) in the experimental group and none in the control group were able to mention two ways of helping pregnant and lactating women reduced their workload to conserve energy and prevent depletion; two participants (7.1%) in the experimental group compared to 12 (40.0%) in the control group were able to mention only one way.

Variables	Response basedon the Content of the TrainingModule	Experimental		Control	
		N	%	N	%
Understanding of safe motherhood	Good	23	82.1	0	0.0
	Poor	5	17.9	25	83.3
	Nil	0	0.0	5	16.7
List 2 components of safe motherhood initiative	Good		96.4	0	0.0
	Poor	1	3.6	15	50.0
	Nil	0	0.0	15	50.0
State 2 nutrition related information that should be given to women of reproductive age at preconception care	Good		78.6	0	0.0
	Poor	6	21.4	18	60.0
	Nil	0	0.0	12	40.0
Mention 3 food sources of Vitamin A	Good	27	96.4	0	0.0
	Poor	1	3.6	19	63.3
	Nil	0	0.0	11	36.7
List 2 specific nutrients (micronutrients) required at the first trimester of pregnancy	Good	25	89.3	0	0.0
	Poor	2	10.7	17	56.7
	Nil	0	0.0	13	43.3
Mention 3 food sources of these specific nutrients listed in question 5 above	Good	26	86.7	0	0.0
	Poor	2	6.7	21	70.0
	Nil	2	6.6	9	30.0
Mention 2 groups of people that are vulnerable to under-nutrition	Good		86.7	0	0.0
	Poor	2	6.7	18	60.0
	Nil	2	6.6	12	40.0
State 2 benefits of family planning services in relation to safe motherhood concept	Good		76.7	0	0
	Poor	4	13.3	13	43.3
	Nil	3	1.0	17	56.7
Mention 2 ways that women of child-bearing age can be economically empowered	Good		80.0	0	0.0
	Poor	2	6.7	16	53.3
	Nil	4	13.3	14	46.7
Mention 2 ways of helping pregnant and lactating women reduced their workload to reduce calorie (nutrient) depletion	Good		86.7	0	0.0
	Poor	2	6.7	12	40.0
	Nil	2	6.6	18	60.0

Table 4: Knowledge of Nutrition Component of SMI among Experimental and Control groups One Month Follow up (Post-test) N=30

Overall, knowledge scores at baseline, immediate post-intervention and one month post-intervention were 12.6±2.9,36.9±3.6 and 39.9±1.7 respectively in the experimental group ($p<0.05$) and 12.2±2.8, 13.7±2.8 and 13.6±2.5 respectively in the control group ($p>0.05$). Difference in knowledge scores between the experimental and control groups at the different stages of assessment was significant ($p<0.05$), except at baseline.

Current Qualifications and Knowledge of Experimental and Control groups on the Nutrition Component of Safe Motherhood Initiative

Table 5 shows the current qualification and knowledge of experimental and control groups on nutrition components of SMI. At pre-test, six (100.0%) of the Nurses in the experimental group and two (100.0%) of the Nurses in the control group had no knowledge of nutrition component of SMI while among the Community Health Workers, 24 (100.0%) in the experimental group and 28 (100.0%) in the control group had no knowledge of the nutrition component of safe motherhood initiatives with no significant difference ($p>0.05$).

At post-test, six (100.0%) of the Nurses in the experimental group and none in the control group had good knowledge of nutrition component of SMI while among the Community Health Workers, 24 (100.0%) in the experimental group and none in the control group had good knowledge of nutrition component of safe motherhood initiatives with significant difference ($p<0.05$). Cadre of health workers did not significantly associate with knowledge of nutrition component of SMI.

At one month follow up (post-test), six (100.0%) of the Nurses in the experimental group and none in the control group had good knowledge of nutrition component of SMI while among the Community Health Workers, 22 (100.0%) in the experimental group and none in the control group had good knowledge of nutrition components of SMI.

Variables	Stage	Category	Experimental				Control				P- value
			Knowledge				Knowledge				
			Good		Poor		Good		Poor		
			N	%	N	%	N	%	N	%	
Current qualification	Pre-test	Nurse	0	0.0	6	100.0	0	0.0	2	100.0	>0.05
		Community Health Worker	0	0.0	24	100.0	0	0.0	28	100.0	
	Post-test	Nurse	6	100.0	0	0.0	0	0.0	2	100.0	<0.05
		Community Health Worker	24	100.0	0	0.0	0	0.0	28	100.0	
	One Month Follow up (Post- test)	Nurse	6	100.0	0	0.0	0	0.0	2	100.0	<0.05
		Community Health Worker	22	100.0	0	0.0	0	0.0	28	100.0	

Table 5: Current Qualification and Knowledge of Experimental and Control groups on the Nutrition Component of Safe Motherhood Initiative (N=30)

Years of Service and Knowledge of Experimental and Control groups on Nutrition Component of SMI

Table 6 shows years of service and knowledge of experimental and control groups on the nutrition component of SMI. At pre-test, 28 (100.0%) of the participants who had worked for 0-20 years in the experimental group and 29 (100.0%) in the control group had no knowledge of nutrition component of SMI. Among those who had worked for 21-40 years, two (100.0%) of the participants in the experimental group and only one (100.0%) in the control group had no knowledge of nutrition component of SMI ($p>0.05$).

At post-test, 28 (100.0%) of the participants who had worked for 0-20 years in the experimental group and none in the control group had good knowledge of the nutrition components of SMI. However, among those who had worked for 21-40 years, two participants (100.0%) in the experimental group and none in the control group had good knowledge of nutrition component of SMI.

Data in Table 6 show that at one month follow up (post-test), 26 (100.0%) of the participants who had worked for 0-20 years in the experimental group and none in the control group had good knowledge of nutrition components of SMI. In addition, among those who had worked for 21-40 years, two participants (100.0%) in the experimental group and none in the control group had good knowledge of the same subject matter.

Stage	Years of Service	Experimental				Control				P- value
		Knowledge				Knowledge				
		Good		Poor		Good		Poor		
		N	%	N	%	N	%	N	%	
Pre-test	00-20	0	0.0	28	100.0	0	0.0	29	100.0	>0.05
	21-40	0	0.0	2	100.0	0	0.0	1	100.0	
Post-test	0-20	28	100.0	0	0.0	0	0.0	29	100.0	<0.05
	21-40	2	100.0	0	0.0	0	0.0	1	100.0	
One Month Follow up (Post- test)	0-20	26	100.	0	0.0	0	0.0	29	100.0	<0.05
	21-40	2	100.0	0	0.0	0	0.0	1	100.0	

Table 6: Years of Service and Knowledge of Experimental and Control groups on the Nutrition Components of Safe Motherhood Initiatives (N=30)

Cadres of Health Worker and Perception of Experimental and Control groups on the Nutrition Component of SMI

Table 7 shows the cadres of health workers and perception of experimental and control groups on the nutrition components of safe motherhood initiatives. At pre-test, six (100.0%) of the Nurses in the experimental group and two (100.0%) of the Nurses in the control group had right perception of nutrition component of SMI while among the Community Health Workers, 24 (100.0%) in the experimental group and 28 (100.0%) in the control group had right perception of nutrition component of SMI. Similar results were obtained at post-test and one month follow-up post-test with no significant difference ($p>0.05$). Generally, perception scores at baseline, intervention and one month post-intervention for experimental group were 20.2±4.8, 21.1±2.3 and 23.0±3.4 respectively compared with 19.2±3.8, 20.3±3.6 and 22.4±4.3 in control respectively ($p>0.05$).

Stage of Intervention	Cadres of Health Workers	Experimental				Control				P- value
		Knowledge				Knowledge				
		Good		Poor		Good		Poor		
		N	%	N	%	N	%	N	%	
Pre-test	Nurse	6	100.0	0	0.0	2	100.0	0	0.0	>0.05
	Community Health Worker	24	100.0	0	0.0	28	100.0	0	0.0	
Post-test	Nurse	6	100.0	0	0.0	2	100.0	0	0.0	<0.05
	Community Health Worker	24	100.0	0	0.0	28	100.0	0	0.0	
One Month Follow up (Post- test)	Nurse	6	100.0	0	0.0	2	100.0	0	0.0	<0.05
	Community Health Worker	22	100.0	0	0.0	28	100.0	0	0.0	

Table 7: Cadres of Health Worker and Perception of Experimental and Control groups on the Nutrition Components of Safe Motherhood Initiatives (N=30)

Discussion

Participants in the experimental and control groups in this study had no knowledge of the nutrition component of SMI at pre-intervention. This lack of knowledge may be a reflection of no understanding of health workers on nutrition component of SMI among many PHC workers. At immediate post- intervention and one month post-intervention (follow up), knowledge of experimental group increased while there was no significant change in the knowledge of nutrition component of SMI among the control group. It could be argued that the increase in knowledge among the experimental group was because the group was exposed to training intervention. This was in consonant with the study on the impact of training on the performance of Community Health Care Workers in New York City, which found that training improved the performance of this group of health workers on selected skills [10]. A study by Oshiname and Brieger, which adopted the quasi-experimental design, yielded this pattern of knowledge gain reported among the experimental and control groups at post-intervention [11]. It was observed that there was little improvement in the knowledge of the control at post-test, even though the group was not exposed to any training.

The reason that could be provided for this observation can be linked with the fact that when the control group was asked some questions on nutrition component of SMI, they could not respond correctly. However, the questions asked might have prompted them to seek for answers to those questions before the post-testing. Although, this action did not provide them the leverage to answer the questions correctly like the trained group (the experimental) but it has influenced their knowledge to some extent and this could have been the reasons for showing poor knowledge at post-test rather than no knowledge shown at the pre-test in Tables 3 and 4 especially.

In this study, qualification, level of education, years of service and cadre/post of the experimental and control groups at pre-intervention, immediate post-intervention and one month post-intervention were not determinants of their knowledge of nutrition component of SMI and insignificantly different. This finding is in contradiction to Mehta and Helen who reported that educational qualification was a determinant of the level of knowledge regarding lead and lead poisoning among parents [12].

A comparison of the mean knowledge scores of the experimental and control groups at pre-intervention showed it was nil and insignificantly different. The comparison of the mean knowledge scores at immediate post-intervention and one month post-intervention within the experimental and control groups indicated a significant difference only in the experimental group because they were exposed to training and this intervention increased their knowledge on the nutrition component of SMI. Similar results were obtained by Strange et al who conducted a study to assess the effects of a peer-led sex education training intervention on participant's knowledge and attitudes relating to sexual health issues and their perception of the impact of the peer education programme on them [13]. They observed a significant difference in the pre-test and post-test scores of the experimental group only. The knowledge of the intervention group increased at one month post-intervention because they all put into practice things they learnt at the training and the influence of text message as reinforcement may not be ruled out. Also, some of the participants might have engaged in self-study of the training manual that was given to them at the training over again.

Impact evaluation of the training intervention

The impact of the training intervention on the experimental group was measured one month after the training. Each of the participants explained how the knowledge acquired had helped them in giving nutrition information to the pregnant and lactating women who visited their clinics. They were able to counsel them to increase their intake of adequate nutrients essential during SMI, monitor their weight gain, counsel them to reduce energy expenditure/workload by using energy saving devices, diversify their diets, prescribe and provide iron and folic acid supplements for the pregnant ones. Also, recommend multiple micronutrient supplements, diagnose and treat those with severe anaemia, distribute vitamin A to post–partum women, discourage them from strenuous physical activity or work as the pregnancy advances, encourage women of reproductive age to observe more rest during pregnancy, advise to request family members to help with domestic chores, help to manage common symptoms related to food intake like vomiting, diarrhoea and loss of appetite.

Participants perceived nutrition components of safe motherhood initiatives

On comparing the perception of the experimental and control groups at baseline, immediate post- intervention and one month post-intervention relating to nutrition component of SMI, it was noted that all the participants had right perception. This observation did not corroborate what Dreyer found in an intervention aimed at assessing the effect of training on teachers' perception of violence against women in South Africa [14]. Dreyer noted that there was a change in perception after exposure to a training intervention.

Conclusion and Recommendation

The level of knowledge of health workers on nutrition component of SMI in both Egbeda and Ido LGAs at pre-intervention stage was nil. The training programme was found to be effective in improving the experimental group's knowledge on the nutrition component of SMI.

Lack of significant change in knowledge in the control group of health workers was a demonstration of the positive effects of the training intervention on the intervention group of health workers. A periodic in- service training on nutrition component of SMI is recommended to improve services rendered by PHC workers.

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