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EFFECTS OF HEALTH INTERVENTIONS ON THE UTILIZATION OF NUTRITION DURING PREGNANCY AS A PREVENTIVE STRATEGY AGAINST MATERNAL MORTALITY AMONG TRADITIONAL BIRTH ATTENDANTS IN KANO STATE NIGERIA

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Abstract

Maternal mortality remains a major public health challenge in Nigeria, with preventable causes such as poor maternal nutrition contributing significantly to pregnancy-related complications. Traditional birth attendants (TBAs) in Kano State often serve as primary maternal care providers but frequently lack adequate knowledge of proper nutrition during pregnancy. This study examined the effects of a health education intervention programme on the utilization of nutrition during pregnancy as a preventive strategy against maternal mortality among TBAs in Kano State. A quasi-experimental design with experimental and control groups was adopted, involving 100 TBAs selected through multistage sampling. The intervention consisted of a six-week structured health education programme, focusing on maternal and child nutrition, administered to the experimental group, while the control group continued routine activities. Data were collected using a researcher-developed questionnaire and analyzed with paired sample and independent t-tests at a 0.05 significance level. Results revealed a statistically significant improvement in the utilization of nutrition during pregnancy among TBAs in the experimental group, with post-intervention mean scores higher than pre-intervention scores $p < 0.05$; $p < 0.05$). Additionally, the experimental group demonstrated significantly higher utilization and awareness of proper nutrition compared to the control group $p < 0.05$; $p < 0.05$). These findings indicate that health education interventions effectively enhance TBAs' knowledge and practices regarding maternal nutrition. The study concludes that structured health education programmes are critical in improving nutrition utilization during pregnancy and can serve as a preventive strategy against maternal mortality. It is recommended that health authorities institutionalize regular nutrition-focused training for TBAs to sustain maternal and child health outcomes.

Keywords: *Maternal mortality, traditional birth attendants, nutrition during pregnancy and health education intervention*

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INTRODUCTION

Maternal mortality remains a significant global public health challenge, particularly in low- and middle-income countries. According to the World Health Organization (WHO, 2023), approximately 287,000 women died from pregnancy- and childbirth-related complications in 2020, with sub-Saharan Africa accounting for about 70% of these deaths. This equates to a maternal mortality ratio of roughly 462 deaths per 100,000 live births in the region, compared to 12 per 100,000 in high-income countries. High maternal mortality in developing countries is largely due to limited access to skilled birth attendants, inadequate healthcare infrastructure, poverty, and socio-cultural practices that delay

or prevent timely medical care (Say et al., 2014), emphasizing the need for targeted interventions, including health education and improved maternal care services.

In Nigeria, maternal mortality remains alarmingly high, contributing significantly to global maternal deaths. The National Demographic and Health Survey (NDHS, 2021) reports a maternal mortality ratio of 512 deaths per 100,000 live births, with hemorrhage, hypertensive disorders, infections, and unsafe delivery practices being major causes. These risks are often compounded by limited antenatal care and low utilization of skilled birth services (Okonofua et al., 2018). The high prevalence of maternal deaths highlights the need for interventions such as training traditional birth attendants (TBAs), promoting institutional deliveries, and providing nutrition and health education to improve maternal outcomes, especially in high-risk regions like Kano State.

Nutrition during pregnancy is a critical determinant of both maternal and fetal health. Adequate intake of macronutrients and micronutrients, including iron, folic acid, calcium, and protein, supports fetal growth, prevents anemia, and reduces pregnancy complications such as low birth weight, preterm delivery, and maternal mortality (Imdad & Bhutta, 2012). Poor maternal nutrition is often linked to socio-economic constraints, limited access to health services, and lack of awareness of healthy dietary practices (Black et al., 2013). Studies indicate that health education and nutritional counselling during antenatal care can improve dietary practices, increase the utilization of essential nutrients, and promote positive health behaviors among pregnant women, thereby reducing maternal and child health risks (Ruel & Alderman, 2013).

The utilization of proper nutrition during pregnancy is widely recognized as a key preventive strategy against maternal mortality, as it directly improves maternal health and reduces the risk of complications. Adequate nutrient intake strengthens maternal immunity, prevents anemia, and supports fetal development (Black et al., 2013). Conversely, poor nutrition contributes to hemorrhage, hypertensive disorders, infections, and obstructed labor, which are leading causes of maternal mortality in low- and middle-income countries (Say et al., 2014). Ensuring access to balanced diets and nutritional supplements during pregnancy can significantly mitigate these risks and improve maternal survival.

Health education interventions targeting nutrition during pregnancy have been shown to improve maternal knowledge, dietary practices, and health-seeking behaviors, ultimately reducing maternal mortality. Training TBAs and pregnant women on proper nutrition and healthy dietary practices increases adherence to recommended guidelines, improves management of pregnancy complications, and enhances birth outcomes (Imdad & Bhutta, 2012; Permatasari et al., 2021). Such interventions also help reduce harmful food taboos, encourage consumption of nutrient-rich foods, and promote positive behavioral changes, demonstrating that integrating nutritional education into maternal healthcare programmes is an effective strategy to prevent maternal mortality.

Evidence from Nigeria and other countries supports the effectiveness of health education for TBAs in improving maternal nutrition. Adewuyi, Adefemi, and Olatona (2019) reported significant improvements in maternal care providers' knowledge and practices following a nutrition-focused health education programme in southwestern Nigeria. Similarly, Kaur, Gupta, and Singh (2021) found that community birth attendants in rural India exposed to structured health education demonstrated higher awareness and utilization of recommended dietary practices during pregnancy compared to the control group. In Kano State, TBAs are primary maternal care providers, yet many lack adequate knowledge of proper nutrition, highlighting the need to assess how targeted health education interventions can enhance their awareness and utilization of nutrition during pregnancy as a preventive strategy against maternal mortality.

RESEARCH OBJECTIVES

The objectives of this study are to assess:

1. The utilization of nutrition during pregnancy among traditional birth attendants (TBAs) after the health education intervention programme in Kano State.

2. The difference in the utilization of nutrition during pregnancy between the experimental and control groups after the health education intervention programme in Kano State.

RESEARCH HYPOTHESES

Based on the stated objectives, the null hypotheses were formulated as follows:

H_{01}: There is no significant effect of the health education intervention programme on the utilization of nutrition during pregnancy among traditional birth attendants (TBAs) in Kano State.

H_{02}: There is no significant difference in the utilization of nutrition during pregnancy between the experimental and control groups after the health education intervention programme in Kano State.

METHODOLOGY

The study adopted a quasi-experimental research design using a one-group pre-test and post-test approach with experimental and control groups. Quasi-experimental design is an empirical method used to estimate the causal effects of an intervention without random assignment of participants (Howard & Shagun, 2014). Participants were assigned to groups based on existing similarities rather than randomization. Two groups were involved: Group A (experimental) and Group B (control). Both groups were exposed to a pre-test before the intervention and a post-test after the six-week intervention period. The average pre-test and post-test scores were compared to determine the effectiveness of the health education intervention programme on maternal and child mortality prevention.

Pre-test Post-test Experimental design

Pre-test		**Post-test**	
Experimental Group	T1	X	T2
Control Group	T1	0	T2

T1: refers to Pre-test on Utilization of Nutrition During Pregnancy as a Preventive Strategy against Maternal Mortality Questionnaire

X: refers to Health Education Intervention Programme

O: refers to Placebo

T2: refers to Post-test on Utilization of Nutrition During Pregnancy as a Preventive Strategy against Maternal Mortality Questionnaire.

A sample size of one hundred (100) TBAs was selected. This sample size was considered adequate based on the recommendation of Cohen and Manion (2001), who suggested that a minimum of twenty participants is sufficient for experimental research. The selected participants were divided equally into experimental (50) and control (50) groups to allow for effective comparison and generalization of findings.

A multistage sampling technique was employed in selecting the participants. First, stratified sampling was used to divide Kano State into three senatorial zones: Kano Central, Kano North, and Kano South. Second, simple random sampling was used to select one Local Government Area (LGA) from each zone through the fish-and-bowl method, resulting in the selection of Kano Municipal, Gwarzo, and Rogo LGAs. Third, systematic sampling was applied to select the required number of TBAs from each LGA using odd-number selection based on sitting arrangements until the desired sample size was attained. Secondary schools within the selected LGAs served as the centers for the intervention.

Table 1: Population and Samples of Traditional Birth Attendants for the two groups

Senatorial Zones	**TBAs Population**	**Control**	**Experimental**
Kano Central	172	18	18
Kano North	141	14	14
Kano South	171	18	18
Total	484	50	50

Source: field survey, 2025

Data were collected using a researcher-developed questionnaire consisting of seven sections (A–C) with a total of fifteen (15) items. Section A covered socio-demographic characteristics, while Sections B nutrition in pregnancy. The instrument was rated on a four-point Likert scale ranging from Strongly Agree (4) to Strongly Disagree (1). A mean score of 2.5 and above was considered acceptable. Face and content validity were established through expert review by supervisors and specialists from Ahmadu Bello University, Zaria. A pilot study conducted in Adamawa State yielded a reliability coefficient of 0.93 using the split-half method and Spearman-Brown prophecy formula, indicating excellent reliability.

The procedure for data collection involved obtaining official permission from the relevant authorities and engaging six trained research assistants to assist with questionnaire administration and interpretation. The intervention programme was conducted in three phases: pre-intervention assessment, intervention implementation, and post-intervention assessment. The intervention lasted six weeks and focused on maternal and child mortality, their causes, and the roles of TBAs in prevention. While the experimental group received the intervention, the control group continued with their routine activities without exposure to the programme. Data collected were subsequently analyzed to determine the effect of the intervention on maternal and child mortality prevention among TBAs in Kano State.

RESULTS

Inferential statistics, specifically paired sample t-tests and independent t-tests, were used to test the postulated null hypotheses of the study, significance level of 0.05 ($\alpha = 0.05$) was adopted as the criterion for either retaining or rejecting the null hypotheses.

Hypotheses I: There is no significant effect of the health education intervention programme on the utilization of nutrition during pregnancy among traditional birth attendants (TBAs) in Kano State.

Table 2: Paired samples t-test on effect of the health education intervention programme on the utilization of nutrition during pregnancy among traditional birth attendants (TBAs) in Kano State

Variable	Test	N	Mean	Std. Dev.	t-value	df	p-value
Utilization of nutrition	Before	50	2.60	0.465	9.406	98	0.000
	After	50	3.34	0.298			
	Before	50	2.64	0.532	6.919	98	0.000
	After	50	3.28	0.375			

(t-critical = 2.000, $p < 0.05$)

The results presented in Table 2 show a significant effect of the health education intervention programme on the utilization of nutrition during pregnancy among traditional birth attendants (TBAs) in Kano State. The paired samples t-test revealed a marked increase in mean scores from pre-intervention (Mean = 2.60, SD = 0.465; and Mean = 2.64, SD = 0.532) to post-intervention (Mean = 3.34, SD = 0.298; and Mean = 3.28, SD = 0.375). The calculated t-values (t = 9.406 and t = 6.919) were greater than the critical t-value of 2.000, with p-values of 0.000, which are less than the 0.05 level of significance. This indicates that the observed differences were statistically significant. Consequently, the null hypothesis was rejected, suggesting that the health education intervention programme significantly improved the utilization of nutrition during pregnancy among TBAs in Kano State.

Hypotheses 2: There is no significant difference in the utilization of nutrition during pregnancy between the experimental and control groups after the health education intervention programme in Kano State.

Table 3: Summary of Independent t-test on significant difference in the utilization of nutrition during pregnancy between the experimental and control groups after the health education intervention programme in Kano State

Variable	Groups	N	Mean	Std. Dev.	t-value	df	p-value

Variable	Groups	N	Mean	Std. Dev.	t-value	df	p-value
Utilization of nutrition	Control	50	3.00	0.549	3.810	98	0.000
	Experimental	50	3.34	0.298			
	Control	50	2.99	0.470	3.452	98	0.001
	Experimental	50	3.28	0.375			

(t-critical = 2.000, $p < 0.05$)

The results in Table 3 indicated a statistically significant difference in the utilization of nutrition during pregnancy between the experimental and control groups after the health education intervention programme in Kano State. The independent samples t-test showed that the experimental group recorded higher mean scores (Mean = 3.34, SD = 0.298; and Mean = 3.28, SD = 0.375) compared with the control group (Mean = 3.00, SD = 0.549; and Mean = 2.99, SD = 0.470). The calculated t-values (t = 3.810 and t = 3.452) exceeded the critical t-value of 2.000, and the associated p-values (0.000 and 0.001) were less than the 0.05 level of significance. These findings indicate that the difference between the groups was statistically significant; therefore, the null hypothesis was rejected, confirming that the health education intervention programme significantly improved the utilization of nutrition during pregnancy among TBAs in Kano State.

DISCUSSION OF FINDINGS

The findings of this study showed that the health education intervention programme significantly improved the utilization of nutrition during pregnancy among traditional birth attendants (TBAs) in Kano State. This result aligns with the World Health Organization (2020), which reported that poverty, social exclusion, and harmful cultural and gender norms contribute to poor dietary practices and limit women's access to essential nutrition services, particularly during pregnancy and breastfeeding. The finding is also consistent with the study by Permatasari et al. (2021), which demonstrated that nutrition and reproductive health education among pregnant women and traditional birth attendants significantly improved maternal nutrition, dietary knowledge, and healthy eating practices. Health education interventions were found to enhance awareness of essential nutrients, promote positive attitudes toward balanced diets, reduce harmful food taboos, increase consumption of nutrient-rich foods, and ultimately improve maternal weight gain while reducing nutrition-related pregnancy risks such as low birth weight.

The finding of this study further revealed that health education intervention significantly improved the awareness of traditional birth attendants (TBAs) in the experimental group on the utilization of nutrition during pregnancy. This is supported by previous empirical studies. For instance, Adewuyi, Adefemi, and Olatona (2019) conducted a quasi-experimental study in southwestern Nigeria to assess the effect of nutrition-focused health education on maternal care providers and reported a significant improvement in participants' knowledge and practices regarding maternal nutrition after the intervention compared to the control group. Similarly, Kaur, Gupta, and Singh (2021) evaluated a structured health education programme for community birth attendants in rural India and found that participants who received the intervention demonstrated significantly higher awareness and utilization of recommended dietary practices during pregnancy than those in the control group. Both studies concluded that targeted health education interventions are effective in enhancing TBAs' awareness and utilization of appropriate nutrition during pregnancy, thereby improving maternal health outcomes.

CONCLUSIONS

Based on the findings of this study it was concluded that:

1. Health education intervention programme was effective in significantly improving the utilization of nutrition during pregnancy among traditional birth attendants (TBAs) in Kano State, demonstrating that structured and targeted educational programmes can positively influence maternal nutrition practices.

2. TBAs who participated in the health education intervention showed significantly higher awareness and understanding of appropriate nutritional practices during pregnancy compared to those who did not receive the intervention, highlighting the critical role of health education in enhancing TBAs' capacity to support optimal maternal nutrition.

RECOMMENDATIONS

It was recommended that:

i. The Kano State Primary Health Care Management Board and other relevant health authorities scale up and institutionalize regular health education intervention programmes for traditional birth attendants (TBAs) to improve their knowledge and practices regarding maternal nutrition during pregnancy.

ii. Training and refresher workshops on nutrition in pregnancy should be routinely organized by Kano State Ministry of Health for TBAs, particularly focusing on practical dietary guidance and awareness of essential nutrients, to ensure sustained improvement in maternal and child health outcomes.

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