

Impact of Nutrition Education Intervention Programme On Nutritional Awareness Among Pregnant Women in Ningi Local Government Area of Bauchi State, Nigeria

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ABSTRACT: *This study assessed the impact of nutrition education intervention programme on nutritional awareness among pregnant women in Ningi Local Government Area of Bauchi State, Nigeria. The population for this study comprised of thirty-three thousand and thirty-five (33,035) pregnant women in Ningi LGA, Bauchi State. Multi-stage sampling techniques of clustered, simple random sampling, proportionate sampling and systematic sampling technique were used to select one hundred (100) participants as a sample size of the study. Quasi-experimental research design was adopted for this study. The research instrument for the collection of relevant data for this study is a researcher-developed closed-ended questionnaire which is divided into four (4) sections (A, B, C and D) on the adapted General Nutritional Awareness Questionnaire (AGNAQ) developed by Kliemann, Wardle, Jonhson, and Croker (2016). The instrument was validated by five (5) experts in the field of Human Kinetics and Health Education, Public Health and Nursing Science. Reliability index of 0.71 was obtained using split-half method of thirty (30) pregnant women who were attending ANC at the general hospital in the Birnin Kudu Local Government Area of Jigawa State and data collected was subjected to statistical test using Spearman Brown's Prophecy Formula. Frequency count and percentage were used to describe the described the socio-demographic information of the respondents. Paired sample t-test and independent t-test was used to test formulated null-hypotheses at 0.05 level of significant. The result of the study indicated that there is significant impact of nutrition education intervention programme on nutritional awareness among pregnant women in Ningi LGA, Bauchi State ($t=52.723$, $df: 99$; $P<0.05$); and there is significant difference between the experimental and the control groups after nutrition education intervention programme ($t=-39.2$, $df: 98$; $P<0.05$). It was recommended that Seminar and workshop should be organized periodically to the primary health workers on nutritional education intervention programme during ANC to improves nutritional awareness of pregnant women by optimising collaboration between primary health care agency, government, non-governmental organizations, and maternal and child health service providers.*

KEYWORDS: Impact, nutrition education, intervention programme, nutritional awareness, pregnant women

INTRODUCTION

Pregnancy is a sensitive and critical stage in women's lives and introduces different physical, physiological, hormonal and anatomical changes. These modifications necessitate life style alteration by pregnant woman. As a result, pregnant women should eat a balanced diet that is essential for their foetus's growth and development (Nesrin, Abu-Bakar, Hanan, Abusbaitan, Al-Ashram & Ali, 2021). During pregnancy, the body undergoes significant physical and hormonal changes and well-balanced diet is beneficial to the mother's predicted weight gain as well as the foetus's growth and development. It also aids in the improvement of birth outcomes and the prevention of ailments such as heart disease and obesity in later life (Zelalem, Endeshaw, Ayenew, Shiferaw & Yirgu, 2017). A typical pregnancy lasts 40 weeks from the first day of the last menstrual period (LMP) to the birth of the baby. It is divided into three stages, called trimesters: the first trimester, second trimester, and third trimester (Academy for Educational Development [AED], 2020). The recommended caloric intake for a normal weight woman who exercises less than 30 minutes per week is 1,800 calories per day during the first trimester, 2,200 calories per day during the second trimester, and 2,400 calories per day during the third trimester (Darnton, 2015; Becquey & Martin-Prevel, 2016; Duyer, 2018).

Nutritional awareness was defined as self-perception of the importance assigned to eating balanced diet and classified as high, moderate, or of little importance. Nutrition awareness has a profound influence on food choice and, concomitantly, nutrient intake (Dallongeville, Marecaux, Cottel, Bingham, & Amouyel, 2017; Gates & McDonald, 2019). Awareness about proper nutrition, food nutritive value, and healthy eating practices can make a difference in the health of a society and country as a whole (Amany & Naglaa 2018; Aslam, Khalid, Kamran, Jabeen, & Azhar, 2017). Theoretical models of food choices suggest that individuals' awareness or tacit assumptions about food are key determinants of food choices. Therefore, self-perception of the importance of balanced diet can be viewed as an important factor that may influence dietary choices and nutritional intake. However, awareness can be modified by knowledge gained through one's own perceptions or by means of communicating information (Paquette, 2018).

Nutritional education about a healthy diet and lifestyle during pregnancy can be a good time to encourage adequate daily iron, folic acid intake, and other pregnancy-specific foods. Nutrition education programs endeavor to improve participants' dietary intakes during pregnancy by promoting a balanced diet. Overwhelming evidence suggests that nutrition education during pregnancy has a significant impact on awareness and dietary habits of pregnant women, which enables them to improve maternal and birth outcomes (Claire, Stallin, & Robert, 2018; Ethiopian Demographic and Health Survey [EDHS], 2019). However, pregnant women's awareness of nutrition is a vital element in ensuring positive results of pregnancy, whether for the woman or foetus.

Fallah, Pourabbas, Delpisheh, Veisani, and Shadnoush (2018) conducted a study on effects of nutrition education on levels of nutritional awareness of pregnant women in western Iran and reported that the awareness level of pregnant women about healthy nutrition was significantly

increased from 3% before intervention to 31% after the nutritional education intervention. Another study was carried out by Permatasari, Rizqiya, Kusumaningati, Suryaalamsah, and Hermiwahyoeni (2021) on effect of nutrition and reproductive health education of pregnant women in Indonesia using quasi experimental study and reported that pregnant women in the intervention group indicated a significant increase in awareness regarding dietary behaviour after receiving nutritional education. Similar study was conducted by Chrismiari and Novita (2019) on improved nutrition awareness and practice through intensive nutrition education: A Study among pregnant women in Nias Island, Indonesia, which observed that significant improvement in awareness scores was observed in the intensive nutrition education (INE) group after the intervention, whereas only a insignificant improvement in awareness was found in the non-intensive nutrition education (NNE) group. Gezahegn, Amanuel, and Abinet (2018) carried out a study on effect of nutrition education based on the health belief model on nutritional awareness and dietary behaviour of pregnant women in Dessie Town, Northeast Ethiopia: a cluster randomized control trial and the finding revealed that the mean pre-and post-intervention nutritional awareness was 6.9. The increase in mean nutritional awareness was statistically significant. In the control group, the pre-and post-intervention mean nutritional awareness was 7.4.

Bauchi State is one of the states in the northern part of Nigeria that spans two distinctive vegetation zones, namely the Sudan Savannah and the Sahel Savannah. Bauchi State is located in the northern eastern part of Nigeria and consists of twenty (20) Local Government Areas (Bauchi State Government [BASG], 2018). Ningi is a local government area and an emirate in Bauchi State, Nigeria. The Ningi emirate comprised two local government areas (Ningi LGA and Warji LGA) with a combined area of 5,250 km² and a population of 501, 912 according to the 2006 Census. Anasari, Pimentel, Omer, Gidado, Baba, and Anderssonm (2020) reported that anemia in pregnancy is a common health problem in Ningi LGA, Bauchi State and it is associated with both maternal and prenatal complications. They further added that there is a high prevalence of anemia in pregnancy-related to under-nutrition among pregnant women in Ningi LGA, Bauchi State.

According to medical records from some of the health facilities in Ningi LGA, Bauchi State, pregnant women in Ningi LGA, Bauchi State, have been affected by under-nutrition due to insufficient amounts of micronutrients as a result of resource limitations and intake of micronutrients less than recommended values, which increases women's risk of micronutrient deficiencies. It was also discovered that the burden of maternal and child under-nutrition is extremely high in Ningi LGA, Bauchi State therefore, poor pregnancy outcomes, such as obstructed labor, are on the rise. It is in line with the WHO (2021) report that pregnancy is a critical stage of development during which maternal nutrition can strongly influence obstetric and neonatal outcomes. Optimal nutrition is necessary to maintain the health of the mother, to help ensure a normal, healthy delivery, and to reduce the risk of birth defects. Therefore, during pregnancy, the body's needs increase by 13% energy, 54% protein, and 50% vitamins and minerals. It is against this background that the researcher intends to investigate the impact of nutrition education intervention programme on nutritional awareness among pregnant women in Ningi local government area of Bauchi state, Nigeria. The study answered the following questions by testing the formulated null-hypotheses: (1) What is the impact of the nutrition

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education intervention programme on nutritional awareness among pregnant women in Ningi LGA, Bauchi State? (2) What is the difference between the experimental and control groups after nutrition education intervention programme?

Purpose of the Study

The purpose of this study is to determine:

1. The impact of the nutrition education intervention programme on nutritional awareness among pregnant women in Ningi LGA, Bauchi State
2. The difference between the experimental and control groups after nutrition education intervention programme

Hypotheses

On the basis of stated research questions, the following hypothesis are formulated to guide the study:

H₀₁ There is no significant impact of nutrition education intervention programme on nutritional awareness among pregnant women in Ningi LGA, Bauchi State

H₀₂ There is no significant difference between the experimental and the control groups after nutrition education intervention programme

METHODOLOGY

Research Design

Quasi-experimental research design with pre-test and post-test experimental and control groups was adopted for this study. Therefore, the treatment group was exposed to a nutrition education intervention programme while the control group was not exposed to any treatment but will be given a placebo. The two groups of participants were: Group A (the experimental group) and Group B (the control group).

Population

The population for this study comprised of thirty-three thousand and thirty-five (33,035) pregnant women in Ningi LGA, Bauchi State, which is 5% of the total population of the entire people of Ningi LGA. According to WHO (2020), pregnant women represent approximately 5% of the total population. The sample size of this study is one hundred (100) participants. Yamane (1967) stated that if the population of the study is greater than one hundred thousand (100,000), the sample size should be one hundred (100), at 10% precision levels where the confidence level is 95% and $P=.5$, therefore, sample for this study was selected among the pregnant women who have attended Ante-Natal care (ANC) at all the health facilities in Ningi LGA, Bauchi State. The sampling for this study consists of multi-stage sampling techniques: Stage I: In this first stage, Primary Health Care in Ningi LGA are clustered into thirty-seven (37) health facilities. (Bauchi State Primary Health Care Development Agency [BSPDA], 2021). Stage II: A simple random sampling technique was used to select six (6) health facilities from the thirty-seven (37) clustered health facilities in Ningi LGA. Stage III: Proportionate sampling technique was used to select ten percent (10%) of the respondent as sample size from the records of pregnant women in each of the selected health facility. Stage IV: The respondents in each selected facility were selected using a systematic sampling technique. This was done

Instrument for Data Collection

The research instrument for the collection of relevant data for this study is a researcher-developed closed-ended questionnaire which is divided into four (4) sections (A, B, C and D). Section "A" consists of the four items on socio-demographic characteristics of participants, section "B" consists of the twenty-three (23) items on the adapted General Nutritional Awareness Questionnaire (AGNAQ) for this study, developed by Kliemann, Wardle, Jonhson, and Croker (2016). It is designed on a modified 4-point Likert scale of Strongly Agree, Agree, Disagree, and Strongly Disagree. The positive statements on the questionnaire are scored from 4-points to 1-point, while the negative statements are scored from 1-point to 4-points. Five (5) copies of the instruments were given to five (5) experts in the field of Human Kinetics and Health Education, Public Health and Nursing Science. Reliability index of 0.71 was obtained using split-half method of thirty (30) pregnant women who were attending ANC at the general hospital in the Birnin Kudu Local Government Area of Jigawa State and data collected was subjected to statistical test using Spearman Brown's Prophecy Formula.

Procedure for Data Collection

An introductory letter was collected from the Head of department, Physical and Health Education, Aminu Saleh College of Education Azare, which was submitted to the office of the Director of Primary Health Care in Ningi LGA, Bauchi State, and the research ethical committee's report was submitted to the office director of primary health care in Ningi LGA, Bauchi State, for permission to carry out the study. Four research assistants was hired and instructed on how to administer and retrieve the instruments: one with a Bachelor of Science in Education, one with a Bachelor of Science in Health Education, and two with Bachelor's degrees in Nutrition and Dietetics. The instruction was take place over two sessions, lasting one hour each week for two weeks. Intervention programme: The administration of the research instruments was done in three phases, that aree: Phase 1: Pre-intervention assessment, Phase 2: Intervention assessment, Phase 3: Post-intervention assessment

Data Analysis

Simple frequency counts and percentage was used to organize and described the socio-demographic information of the respondents. An inferential statistic of a one paired sample t-test was used to test null hypothesis 1, while independent t-test was used to test null-hypotheses 2, Alpha level of 0.05 was used as a criterion for either retaining or rejecting the null-hypotheses with the Statistical Package for the Social Science (SPSS) software vision 23.0.

Table 1: Demographic information of the respondents

Age	Frequency	Percentage
16-20 years	15	15.0
21-25	12	12.0
26-30	18	18.0
31-35	30	30.0
36-40	20	20.0
41 and above	05	05.0
Total	100	100.0
Location		
Urban	39	39.0
Rural	61	61.0
Total	100	100.0
Stage of pregnancy		
First Trimester	32	32.0
Second Trimester	45	45.0
Third Trimester	23	23.0
Total	100	100.0
Socio-economic Status		
Single Room	43	43.0
Room and Palour	27	27.0
A Room Self-contain	19	19.0
Mini-Flat	07	07.0
Two Bedroom-Flat	03	03.0
Three Bedroom-Flat	01	01.0
Total	100	100.0
Family Monthly Income		
Below ₦50, 000	45	45.0
₦60,000-100,000	17	17.0
Above ₦100,000	38	30.0
Total	100	100.0

Table 1 shows that 15(15.0%) of the respondents are between the age of 16-20 years, 12(12.0%) are between 21-25 years of age, 18(18.0%) are between 26-30 years of age 30(30.0%) are between 31-35 years of age, 20(20.0%) of the respondents are between the age of 36-40 years while 05(05.0%) of the respondents are 41 and above years of age. Regarding the location of the respondents, 39(39.0%) are from urban areas while 61(61.0%) from rural areas. In regard to the stage of pregnancy of the respondents 32(32.0%) are in first trimester, 45(45.0%) of the respondents second trimester and 23(23.0%) are in third trimester. The table 1 also indicated the socio-economic status of the respondents 43(43.0%) have single room apartment, 27(27.0%) have room and palour, 19(19.0%) have a room self-contain apartment, 07(07.0%) have mini-flat, 03(03.0%) have two bedroom-flat apartment and 01(01.0%) have three bedroom-flat apartment. In regard to the family monthly income of the respondents 45(45.0%) earned below ₦50, 000, 17(17.0%) ₦60,000-100,000 monthly income while 38(38.0%) earned above ₦100,000 monthly income.

Null-hypothesis: There is no significant impact of nutrition education intervention programme on nutritional awareness among pregnant women in Ningi LGA, Bauchi State

Table 2: Summary of paired sample t-test on impact of Nutrition Education Intervention Programme on Nutritional Awareness among Pregnant Women in Ningi LGA, Bauchi State

Variable	Test	Mean	N	SD	t	df	P
impact of NEP on nutritional awareness	Pre-Test	26.8900	100	5.48072	-52.723	99	.000
	Post-Test	62.6300	100	4.85477			

$t_{tab}=1.99$, df: 99; $P<0.05$

The result on table 2 shows that the post-test mean scores (62.6300) of the respondents on nutritional awareness is greater than the pre-test mean scores (26.8900) of respondents after nutrition education intervention programme. This indicated that there is significant impact of nutrition education intervention programme on nutritional awareness among pregnant women in Ningi LGA, Bauchi State ($t=52.723$, df:99; $P<0.05$). Therefore, the hypothesis tested is rejected.

Null-hypothesis: There is no significant difference between the experimental and the control groups after nutrition education intervention programme

Table 3: Summary of independent t-test on Difference between the Experimental and the Control groups after Nutrition Education Intervention Programme

Gender	N	Mean	SD	SE	df	t	P
Control Group	50	30.66	2.300	.325	98	-39.2	.000
Experimental Group	50	51.70	3.019	.427			
Total	100						

$t_{tab}=1.99$, df: 98; $P<0.05$

The result on table 3 shows that the mean scores (30.66) of the control group after nutrition education intervention programme is less than the mean scores (51.70) of experimental group after nutrition education intervention programme. It also indicated that there is significant difference between the experimental and the control groups after nutrition education intervention programme ($t=-39.2$, df: 98; $P<0.05$). Therefore, the hypothesis tested is rejected.

DISCUSSION

The result was aimed at finding out impact of nutrition education intervention programme on nutritional awareness among pregnant women in Ningi Local Government Area of Bauchi State, Nigeria. The outcome of this study revealed that there is significant impact of nutrition education intervention programme on nutritional awareness among pregnant women in Ningi LGA, Bauchi State ($t=52.723$, df: 99; $P<0.05$). This finding is in line with the study of Fallah, Pourabbas, Delpisheh, Veisani, and Shadnoush (2018) on the effects of nutrition education on levels of nutritional awareness of pregnant women in western Iran reported that the awareness level of pregnant women about healthy nutrition was significantly increased from 3% before intervention to 31% after the nutritional education intervention. This finding is also similar

with the study of Permatasari, Rizqiya, Kusumaningati, Suryaalamsah, and Hermiwahyoeni (2021) on effect of nutrition and reproductive health education of pregnant women in Indonesia using quasi experimental study and reported that pregnant women in the intervention group indicated a significant increase in awareness regarding dietary behaviour after receiving nutritional education.

The finding of the study also indicated that there is significant difference between the experimental and the control groups after nutrition education intervention programme ($t=-39.2$, $df: 98$; $P<0.05$). The findings of this study was also consistent with the study of Chrismiari & Novita (2019) on improved nutrition awareness and practice through intensive nutrition education: A Study among pregnant women in Nias Island, Indonesia, which observed that significant improvement in awareness scores was observed in the intensive nutrition education (INE) group after the intervention, whereas only a insignificant improvement in awareness was found in the non-intensive nutrition education (NNE) group. The finding also in line with the study of Gezahegn, Amanuel, and Abinet (2018) on the effect of nutrition education based on the health belief model on nutritional awareness and dietary behaviour of pregnant women in Dessie Town, Northeast Ethiopia: a cluster randomized control trial, and the finding revealed that the mean pre-and post-intervention nutritional awareness was 6.9 and 13.4 the intervention group, respectively. The increase in mean nutritional awareness was statistically significant. In the control group, the pre-and post-intervention mean nutritional awareness was 7.4 and 9.8.

CONCLUSIONS

Based on the findings of this study, the following conclusions were drawn:

1. There is significant impact of nutrition education intervention programme on nutritional awareness among pregnant women in Ningi LGA, Bauchi State ($t=52.723$, $df: 99$; $P<0.05$).
2. There is significant difference between the experimental and the control groups after nutrition education intervention programme ($t=-39.2$, $df: 98$; $P<0.05$)

Recommendation

Based on the findings of the study, the following recommended that, Seminar and workshop should be organized periodically to the primary health workers on nutritional education intervention programme during ANC to improves nutritional awareness of pregnant women by optimising collaboration between primary health care agency, government, non-governmental organizations, and maternal and child health service providers

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