



10.5281/zenodo.10216490

Vol. 06 Issue 11 Nov – 2023

Manuscript ID: #1141

## EFFECT OF NUTRITION EDUCATION ON NUTRITIONAL KNOWLEDGE OF RURAL PREGNANT WOMEN IN ENUGU STATE

Prof. J.O. Okafor & Nnadi, Irene Ukamaka

Depart. of Human Promotion and Public Health Education, Faculty of Education, NnamdiAzikiwe University, Awka

### ABSTRACT

The study investigated the effect of nutrition education on nutrition knowledge of rural pregnant women in Enugu State. Ten research questions guided the study and ten null hypotheses were tested at 0.05 level of significance. Quasi-experimental research design was adopted for this study. The population of the study comprised all the 17,164 registered pregnant women in the eight public antenatal clinic centres in Enugu East Local Government Area of Enugu State. The sample for the study comprised 851 registered pregnant women drawn using multistage sampling procedure. The instrument for data collection was “Nutritional Knowledge Test (NKT). The instruments were subjected to face and content validity by three experts, two from the Department of Human Promotion and Public Health Education and one from the Department of Educational Foundations, NnamdiAzikiwe University. The reliability of the instrument was established using Kuder–Richard 20 statistics which yielded coefficient of 0.94. Mean and standard deviation were used to answer the research questions and the hypotheses were tested using the Analysis of Covariance (ANCOVA). The findings of the study revealed among others that the nutritional knowledge mean scores of rural pregnant women of different levels of education and occupation in the experimental were greater than that of the control groups after nutrition education intervention. It was also found that there was significant difference in the nutritional knowledge mean scores of rural pregnant women of both experimental and control groups after nutrition education intervention. Based on the findings, it was recommended among others that health personnel should organize regular interactive sessions for nutrition education intervention to pregnant women during antenatal period in clinic or any health-care facility.

### KEYWORDS:

Nutrition Education, Knowledge, Rural, Pregnant Women.



This work is licensed under Creative Commons Attribution 4.0 License.

## Introduction

Pregnancy is a period that a woman's body undergoes physical and hormonal changes. Fetus that develops inside the woman's womb during pregnancy bring about weight gain in the woman. This period is a very nutritionally demanding period in every woman's life for fetal development. The intake of food during pregnancy is the source of nutrients for the fetus.

The consumption of healthy food from the period of conception is very essential for wellbeing of the mother and fetus in the uterus. In the views of Fallah, Pourabbas, Delpisheh, Vei-sani and Shadnoush (2013) pregnancy is an occasion when women should become more aware of the importance of healthy nutrition and seek for more nutrition-related information. Fallah, et al; further posited that compared to the period before conception and pregnancy, pregnant women should be more eager to know what they should eat and what not to eat. This is to say that the least adequate nutritional practice is crucial for the fetal wellbeing. The pregnant women could be exposed to information in connection to what they are to eat through nutritional education.

Nutritional education is an essential component of antenatal care, helping to promote the health of the pregnant mother and the fetus by creating an awareness of imbibing the culture of eating well through positive change in their nutritional behavior (Okueso&Anetor, 2016). Okueso and Anetor added that it is a component of health education that helps to create this awareness on how to source, prepare, combine and use food resources for promoting good health among all groups of human beings. During nutrition education pregnant women are often clearly informed of how they can improve dietary practices, nutritional status, and reduce the burden of malnutrition (Diddana, Kelkay, Dola&Sadore, 2018). Nutrition education during pregnancy about healthy diet and healthy lifestyle practices during pregnancy could encourage the consumption of adequate diets that contains iron, folic acid intake, and other pregnancy specific foods for well-being of pregnant woman. The pregnant women could gain sufficient knowledge to meet their increasing dietary demands through nutritional education programmes. Nutrition education programmes improve participants' dietary intakes during pregnancy by promoting balanced diet (Zelalem, Endeshaw, Ayenew, Shiferaw&Yirgu, 2017). Furthermore, Zelatem, et al. (2017) stressed that balanced nutrition during pregnancy helps the expected weight gain of the mother and the growth and development of the fetus. The authors added that it also helps to improve birth outcomes and prevents the child from developing diseases such as heart disease and obesity later in life. It provides information to pregnant women on diets that contain the required energy, protein, vitamins and minerals through the consumption of fruits, vegetables and other kinds of diets. Attesting to this fact, Girard and Olude (2012) pointed out that nutrition education focus on enhancing maternal diet quality by increasing

the diversity and amount of foods consumed, adequate weight gain through consumption of sufficient and balanced protein and energy and the consistent and continuing use of micro-nutrition supplements, food supplements or fortified foods. Nutrition education could inculcate in pregnant women health knowledge of diets to take and those to avoid during pregnancy. Pregnant women could make the right choice of diversified diets through health knowledge acquired from nutritional education.

Health knowledge of nutrition education could help rural pregnant women maintain and promote their well-being and that of their fetuses. It helps to create awareness on diets and activities to be undertaken in order to promote good health among pregnant women. Lim, Wong, Lim and Soon (2018) posited that nutritional knowledge during pregnancy is necessary to ensure optimal gestational weight gain and reduces complications both of which are linked to positive birth outcomes and contribute to mother's overall health. This information could help rural pregnant women maintain the ideal weight and prevent excessive weight gain for their well-being and that of their fetuses. The under-weight pregnant women could have more difficulty during delivery. On the other hand, over-weight ones stand the risks of complications, such as diabetes and high blood pressure during pregnancy. The nutritional knowledge and in-take could go a long way in determining the pregnancy outcome and the well-being of the mother and the child after delivery. Adequate nutritional knowledge and favourable attitude of pregnant women will influence their practices positively.

Nutritional practice is eating habits and behaviours of individuals. Nutritional practice is the intake of food necessary for optimal health. Pregnant women with good nutritional practice are more likely to have fewer complications and deliver healthier babies. According to Appiah, Korklu, Bonchel, Fenu and Yankey (2021), nutritional practice is the feeding habits that promote the wellbeing of the mother and foetus and supports health during pregnancy, delivery, and breastfeeding. The nutritional practice affects the growth and development of the foetus. According to Mahlet, Mahlet and Yohannes(2020), nutritional practice is the preference in food consumption or behaviors of dietary habits. Good nutritional practice is a feeding habit that maintains balance in the intake of calories, proteins and other nutrients.

The practice of eating healthy diets among rural pregnant women of various demographic characteristics in Enugu State is dependent on their level of knowledge of nutrition. The maternal demographical information may influence the health knowledge of nutrition education among pregnant women in Enugu State. Such demographic characteristics are age, level of education, occupation and marital status. The marital status are usually classified as single, married or divorced. Married pregnant rural women may be

enlightened by their husbands on nutrition education. This may influence their choice of diets during pregnancy.

Education level could boost rural pregnant women reception and acceptance of nutrition education. Similar to this, Burchi cited in Lim, Wong, Lim and Soon (2018) pointed out that educational level was one of the important predicating factors for nutritional knowledge among rural pregnant women. The education levels are namely; primary, secondary and tertiary levels of education. Udensi, Ifenkwe and Ashiegbu (2015) posited that the more educated the woman becomes, the higher the nutritional status she and members of her household would enjoy. Educated rural pregnant women could acquire knowledge of nutrition in schools. Uwaegbute and Oke cited in Udensi et al; stressed that there is a close link between women's educational level and their involvement in decision making regarding childcare and nutrition/family dietary needs.

The age of rural pregnant women is another variable that may improve their level of understanding and deeper experience in household health and nutritional issues. This implies that rural pregnant women may have experience of relevant nutrition as they advance in age. The older pregnant women could have been exposed to variety of nutritional experience which is likely to improve their knowledge of nutritional education. Gupta (2007) asserted that advancement in age is a factor that may expose older pregnant women to information on food to eat to remain healthy and reduce the risks of most unhealthy conditions such as hypertension, obesity, diabetes and cancer.

Rural pregnant women of different occupational classes may have different knowledge of nutritional education. Some occupations may give rural pregnant women the chance to acquire knowledge of nutrition. Some may keep them busy that they could not have enough time to acquire health knowledge of nutrition. Lim, Wong, Lim and Soon (2018) pointed out that employed pregnant women may have better access to internet, books and magazines as sources of information on nutrition. Lim, et al; (2018) added that they could equally have opportunity to share their experiences and knowledge on nutrition with colleagues in the workplace compared to self-employed ones. The pregnant women are most affected by the insufficient and unbalanced nutritional problems in the developing countries due to poor feeding habits.

The level of nutritional knowledge and practices among pregnant rural women seem to be unsatisfactory in Enugu State. This is buttressed by Ezeh, Maduforo, Nwamarah, Chikwendu and Okoro (2020) who noted that the nutritional knowledge and practice of pregnant women is below expectations which negatively influences their dietary practices and result in low birth weight, disorder of child development and infant mortality in Enugu State. The pregnant women in Enugu State engage in unhealthy nutritional practices of too much consumption of fast foods, snacks, soft drinks and taking dinner at late hour (Attah

and Osadebe, 2022). The pattern of feeding among pregnant women in rural areas in Enugu State may account for birth defects, decreased physical and mental potential of the child, low birth weight, anaemia, toxicaemias of pregnancy, post partum hemorrhage which result in high mortality and morbidity. It is against this background that the study sought to determine the effect of nutrition education on knowledge and practices of rural pregnant women in Enugu State.

### Statement of the Problem

Excessive in-take of some nutrients among pregnant woman may be the contributing factors to malformations or health problems in the fetuses among rural pregnant women in Enugu State. This seems to contribute to child mortality in rural areas in Enugu State. In rural areas of Enugu State, it is alleged that there could be the occurrence of children with birth defects such as low birth weight, over-weight and various malformations of body parts which could be associated with poor nutritional knowledge of pregnant mothers.

Concerted efforts seem to be made by government and non-governmental organisations towards improving the health knowledge of rural pregnant women in Enugu State through nutrition education which contributed to the nutritional development and well being of some rural pregnant women in Enugu State. Although some rural pregnant women may be aware that ideal dieting is imperative amid pregnancy yet they need more concerted information of ideal nutrition necessary for them and their fetus health. This problem prompted the researcher to investigate the effect of nutrition education on knowledge and practices of rural pregnant women in Enugu East Local Government Area of Enugu State.

### Purpose of the Study

The main purpose of the study is to ascertain the effect of nutrition education on nutrition knowledge of rural pregnant women in Enugu State. Specifically, the study determined:

1. The mean score of nutritional knowledge of rural pregnant women in both experimental and control groups, before and after nutrition education intervention.
2. The mean scores of nutritional knowledge of rural pregnant women of different levels of education in both experimental and control groups, before and after nutrition education intervention.
3. The mean scores of nutritional knowledge of rural pregnant women of different occupation in both experimental and control groups, before and after nutrition education intervention.

## Research Questions

The following research questions guided the study. Specifically:

1. What are the nutritional knowledge mean scores of rural pregnant women in the experimental and control groups after nutrition education intervention?
2. What are the nutritional knowledge mean scores of rural pregnant women of different levels of education in the experimental and control groups after nutrition education intervention?
3. What are the nutritional knowledge mean scores of rural pregnant women of different occupation in the experimental and control groups after nutrition education intervention?

## Hypotheses

The following hypotheses were tested at 0.05 level of significance.

1. There is no significant difference in the nutritional knowledge mean scores of rural pregnant women of both experimental and control groups after nutrition education intervention.
2. There is no significant difference in the nutritional knowledge mean scores of rural pregnant women of different levels of education in both experimental and control groups after nutrition education intervention.
3. There is no significant difference in the nutritional knowledge mean scores of rural pregnant women of different occupation in both experimental and control groups after nutrition education intervention.

## Methods

Quasi-experimental research design was adopted for this study. Specifically, it used pre-test, post test control group design. This research design is appropriate for this study because it allowed the researcher to manipulate variables under carefully controlled conditions so that the effects of these manipulations could be observed on the experimental and control groups. The study was conducted in Enugu State of Nigeria, which is one of the states in the South-Eastern part of Nigeria. The choice of Enugu State is due to fact that there are enough food stuff in the area but pregnant women cannot be said to have adequate knowledge of these different food stuffs nor utilize them as their meals. The population of the study comprised all the 17,164 registered pregnant women in the eight public antenatal clinic centres in Enugu East and Nkanu West Local Government Areas of Enugu State. The sample for the study comprised 851 registered pregnant women drawn using multistage sampling procedure. Firstly, simple random sampling technique which involved sampling without replacement was used to select 2 Local Government Areas out of the 17 Local Government Areas in Enugu State, Nigeria. As a result of this procedure, Enugu

East and Nkanu West LGAs were drawn for the study. In the second stage, purposive sampling technique was used to draw two health centres from centres in the two sampled LGAs. Therefore, two health centres participated in the study. The health centres with registered pregnant women that met the criteria of this study in with regards to different age, education level, occupations and marital status as well as qualified medical doctors were purposively sampled. In the third stage, simple random sampling technique was used to draw two intact health centres for the study. The treatment groups which were exposed to nutritional education was 478 registered pregnant women, while the control group constituted 373 registered pregnant women.

The instrument for data collection was “Nutritional Knowledge Test (NKT) that has been developed based on the programme of the study. The instrument was developed by the researcher based on review of related literature. NKT is made up of two sections namely A and B. Section A consisted of demographic variable of the respondents such as education levels and occupations. NKT contains 40 questions as follow: six questions for classes of food, six questions for balance diet, six questions for deficiency diseases, six questions for food borne diseases, six questions for food taboos/healthy feeding habits, six questions for food hygiene and four questions for food for pregnant women.

The instrument was subjected to face and content validity. To do this, the researcher presented the title, purposes of the study, research questions and hypotheses with copies of the test instrument to three experts, two in the Department of Human Promotion and Public Health Education, and one in Measurement Evaluation in the Department of Educational Foundations, all in the Faculty of Education, NnamdiAzikiwe University, Awka. The researcher requested them to examine and scrutinize the items in terms of relevance, suitability, clarity of instruction and content coverage. The experts suggested that the development of more nutritional education intervention programmes, re-arrangement and numbering of answers provided in the post-test of NKT. The validators’ suggestions were put into consideration in the production of the final copy of the instrument.

The test items of the NKT were assessed for reliability using thirty (30) rural pregnant women from Anambra State attending antenatal clinic centres that share similar characteristics and homogenous culture with the women that was used for the study in Enugu State.. The reliability of the instrument was established using Kuder-Richard 20 statistics. The reliability of the instrument was found to be 0.94 for NKT.

Direct method of administration of the instrument was utilized by the researcher together with five research assistants who are Health centre personnel in Enugu East of Enugu State.A permission letter was written to the Ethical Committee of the Ministry of Education. Permission to conduct the study was requested for and obtained from the Head



of the Health Centres (HHC). Arrangement was made with the HHC to inform pregnant women about the purpose of the programme and their consent to participate in the exercise obtained. At the end of the teaching programme, copies of the same instrument was reshuffled and administered to the participants by the researcher and research assistants.

After collecting the pre-test data, the pregnant women were exposed to six sessions (one session each week) of health teaching on various aspects of nutrition education. Each group of women was visited every week to continue with the exercise which lasted for two hours per day. The treatment lasted for a total period of nine (9) weeks. The first week was used for pretreatment, the second to eighth weeks were used for the treatment on topics such as classes of food, balance diet, deficiency diseases, food borne diseases, food taboos/healthy feeding habits, food hygienic and food for pregnant women respectively, while the ninth week was the post-treatment stage. The activities for the seven weeks of treatment are highlighted as follow: the first week was used for teaching classes of food. During the second week, the pregnant women were taught balance diet. In the third week, the pregnant women were taught deficiency diseases. The topic to be covered in the fourth week was food borne diseases. At the fifth week, the pregnant women were taught food taboos/healthy feeding habits. During the sixth week, the pregnant women were taught food hygiene. The topic to be covered in the seventh week was food for pregnant women. Each of the 40 questions on the NKT was scored 1 mark, giving a total of 40 marks. A pregnant woman's score was obtained by summing their scores for all the items. The data were finally be analyzed based on the scores.

Analysis of Covariance (ANCOVA) was employed to control the initial differences of subjects in these intact health centres. The regular health personnel of health centres under the study were briefed and used as research assistants to control the experimental bias. The researcher limited the experimental period to six weeks to minimize the effect of maturation. To control this internal validity threat, the items in the instrument was renumbered and reshuffled to minimize the ability of the pregnant women realizing that they were being re-tested. Data obtained were analyzed using mean and standard deviation to answer the research questions and Analysis of Covariance (ANCOVA) was used to test all the hypotheses at 0.05 level of significance. In the test of hypotheses using ANCOVA, F ratio value was used to determine the acceptance or rejection of the hypotheses.

## Results

**Research Question 1:** What are the nutritional knowledge mean scores of rural pregnant women in the experimental and control groups after nutrition education intervention?

**Table 1:** Nutritional Knowledge Mean Scores of Rural Pregnant Women in the Experimental and Control Groups After Nutrition Education Intervention



Method	N	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Mean differ
Experiential Group	478	15.67	9.08	32.16	7.48	16.49
Control Group	373	14.79	10.11	23.58	8.01	8.79

Table 1 shows that pregnant women in experimental groups exposed to nutrition education had pre-test nutritional knowledge mean score of 15.67 with standard deviation of 9.08, their posttest nutritional knowledge mean score was 32.16 with 7.48 value of standard deviation and mean gain of 16.49. On the other, pregnant women in the control groups had pre-test nutritional knowledge mean score of 14.79 with standard deviation of 10.11, their posttest nutritional knowledge mean score was 23.58 with 8.01 value of standard deviation and 8.79 mean gain. The spread of score in the posttest is more homogenous among pregnant women in the experimental groups (SD = 7.48) than those in the control group (SD = 8.01). The mean knowledge gain difference between the experimental group and control group was 7.70 in favour of the experimental group. The result indicated that the nutritional knowledge mean scores of rural pregnant women in the experimental groups was higher than that of those control groups after nutrition education intervention.

**Research Question 2:** What are the nutritional knowledge mean scores of rural pregnant women of different levels of education in the experimental and control groups after nutrition education intervention?

**Table 2:** Mean Pre-test and Post-test Nutritional Knowledge Scores of Rural Pregnant Women of Different Levels of Education in the Experimental and Control Groups After Nutrition Education Intervention

	Educational Levels	n	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Mean Gain
<b>Experiential Group</b>	Primary	243	13.01	7.10	16.40	4.88	3.39
	Secondary	201	19.54	5.57	25.88	4.01	6.34
	Tertiary	34	21.02	4.00	34.01	2.08	12.99
<b>Control Group</b>	Primary	176	12.79	6.02	14.01	4.12	1.22
	Secondary	155	17.11	6.53	22.71	3.89	5.60
	Tertiary	42	19.34	5.21	26.03	4.11	6.69

Table 2 shows that the pretest nutritional knowledge mean scores of rural pregnant women in the experimental groups who completed primary, secondary and tertiary education were 13.01, 19.54 and 21.02 respectively, while their posttest nutritional knowledge mean scores

were 16.40, 25.88 and 34.01 respectively with mean gain of 3.39, 6.34 and 12.99 respectively. The results showed that the pregnant women in the experimental groups who attended tertiary institution had greater nutritional knowledge mean score than those who attended primary and secondary schools.

The pretest nutritional knowledge mean scores of rural pregnant women in the control groups who completed primary, secondary and tertiary education were 12.79, 17.11 and 19.34 respectively, while their posttest nutritional knowledge mean scores were 14.01, 22.71 and 26.03 respectively with mean gain of 3.39, 6.34 and 12.99 respectively. The results showed that the pregnant women in the control group who attended tertiary institution had greater nutritional knowledge mean score than those who attended primary and secondary schools. The findings indicated that pregnant women in the experimental groups and control groups who attended tertiary institution yielded greater nutritional knowledge mean score after nutrition education intervention than those who attended primary and secondary schools. The result shows that the nutritional knowledge mean scores of rural pregnant women of different levels of education in the experimental groups after nutrition education intervention were greater than that of those in control groups.

**Research Question 3:** What are the nutritional knowledge mean scores of rural pregnant women of different occupation in the experimental and control groups after nutrition education intervention?

**Table 3:** Mean Pre-test and Post-test Nutritional Knowledge Scores of Rural Pregnant Women of Different Occupation in the Experimental and Control Groups After Nutrition Education Intervention.

	Occupation	N	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Mean Diff.
<b>Experiential Group</b>	Unemployed	44	4.10	2.77	6.18	1.11	2.08
	Students	81	13.55	4.29	25.88	2.11	12.33
	Farmers	156	5.76	3.10	8.97	1.12	3.21
	Traders	142	11.06	2.07	21.01	1.01	9.95
	Civil Servants	55	18.42	8.18	32.02	4.33	13.60
<b>Control Group</b>	Unemployed	51	5.29	2.76	7.02	1.33	1.73
	Students	71	14.10	6.81	18.13	4.55	4.03
	Farmers	123	11.17	3.87	14.66	3.22	3.49
	Traders	104	13.77	5.76	16.11	3.19	2.34
	Civil Servants	24	17.43	7.99	23.49	2.07	6.06

As shown in table 3, the pretest nutritional knowledge mean scores of rural pregnant women in the experimental groups who are unemployed, students, farmers, traders and civil servants were 4.10, 13.55, 5.76, 11.06 and 18.42 respectively, while their posttest nutritional knowledge mean scores were 6.18, 25.88, 8.97, 21.01 and 32.02 respectively with mean gain of 2.08, 12.33, 3.21, 9.95 and 13.60 respectively. The results showed that the pregnant women in the experimental groups who were civil servants had greater nutritional knowledge mean score than those who in other occupation.

The pretest nutritional knowledge mean scores of the rural pregnant women in the control groups who were unemployed, students, farmers, traders and civil servants were 5.29, 14.10, 11.17, 13.77 and 17.43 respectively, while their posttest nutritional knowledge mean scores were 7.02, 18.13, 14.66, 16.11 and 23.49 respectively with mean gain of 1.73, 4.03, 3.49, 2.34 and 6.06 respectively. The results showed that the pregnant women in the control groups who were civil servants had greater nutritional knowledge mean score than those who in other occupations. The findings indicated that pregnant women in the experimental groups and control groups who are civil servants yielded greater nutritional knowledge mean score after nutrition education intervention than those in different occupation. The result shows that the nutritional knowledge mean scores of the rural pregnant women of different occupation in the experimental groups after nutrition education intervention was greater than that of those in control groups.

**Hypothesis 1:** There is no significant difference in the nutritional knowledge mean scores of rural pregnant women of both experimental and control groups after nutrition education intervention.

**Table 4:** ANCOVA on Summary of the Nutritional Knowledge Mean Scores of Rural Pregnant Women of both Experimental and Control Groups Before and After Nutrition Education Intervention

Source of variation	SS	Df	MS	F	P-value	Decision
Corrected Model	773.805	2	386.90	114.37	.000	
Intercept	92.956	1	92.96	27.48	.001	Sig.
Pretest	21.721	1	21.72	6.42	.032	
Group	219.575	1	219.58	64.91	.000	
Error	2866.24	848	3.38			
Total	6223.000	851				
Corrected Total	804.250	850				

Table 4 shows that at 0.05 level of significance, 1df numerator and 850 df denominator, the calculated F was 64.91 with P-value of .000 which is less than 0.05. Thus, the null hypothesis was rejected. Therefore, there was significant difference in the nutritional

knowledge mean scores of rural pregnant women of both experimental and control groups after nutrition education intervention.

**Hypothesis 2:** There is no significant difference in the nutritional knowledge mean scores of rural pregnant women of different levels of education in both experimental and control groups after nutrition education intervention.

**Table 5:** ANCOVA Summary of Nutritional Knowledge Mean Scores of Rural Pregnant Women of Different Levels of Education in Both Experimental and Control Groups after Nutrition Education Intervention

Source of variation	SS	Df	MS	F	P-value	Decision
Corrected Model	2623.972	2	1311.99	111.31	.002	
Intercept	273.927	1	273.93	23.24	.017	
Pretest	61.306	1	61.31	5.20	.107	
Group	388.291	1	388.29	32.94	.011	Sig.
Error	9997.92	848	11.79			
Total	37620.000	851				
Corrected Total	2659.333	850				

Table 5 shows that at 0.05 level of significance, 1df numerator and 850 df denominator, the calculated F is 32.94 with p-value of 0.011 which is less than 0.05. Thus, the null hypothesis was rejected. Therefore, there was significant difference in the nutritional knowledge mean scores of rural pregnant women of different levels of education in both experimental and control groups after nutrition education intervention.

**Hypothesis 3:** There is no significant difference in the nutritional knowledge mean scores of rural pregnant women of different occupation in both experimental and control groups after nutrition education intervention.

**Table 6:** ANCOVA Summary of Nutritional Knowledge Mean Scores of Rural Pregnant Women of Different Occupation in both Experimental and Control Groups After Nutrition Education Intervention.

Source of variation	SS	Df	MS	F	P-value	Decision
Corrected Model	2287.906	2	1143.95	9.23	.000	
Intercept	20203.083	1	20203.08	162.93	.000	
Pretest	2210.713	1	2210.71	17.83	.000	
Group	13.261	1	13.26	.11	.035	Sig.
Error	20343.52	848	23.99			

Total	338920.00	851
	0	
Corrected Total	9975.754	850

Table 6 shows that at 0.05 level of significance, 1df numerator and 850 df denominator, the calculated F is 0.11 with p-value of 0.035 which is less than 0.05. Thus, the null hypothesis was rejected. Therefore, there was significant difference in the nutritional knowledge mean scores of rural pregnant women of different occupation in both experimental and control groups after nutrition education intervention.

## Discussion

The finding of the study showed that nutritional knowledge mean scores of rural pregnant women in the experimental were greater than that of the control groups after nutrition education intervention. This agreed with the finding of Zalalem, Endeshaw, Ayenew, Shiferaw and Yirgu (2017) which indicated that the proportion of pregnant women with knowledge of proper nutrition after nutritional education programme intervention increased in those in experimental than those in control group. The agreement between the findings of the studies could be connected to the fact that they were conducted in African countries which shared similarity in education and health care practices. This disagreed with the finding of Teweldemedhin et al. (2021) which revealed that there was no difference in nutritional knowledge mean scores of pregnant women in the experimental and control groups after nutrition education intervention. This disagreement in the findings could be attributed to difference in geographical location and also the pregnant women in both rural and urban areas used by the study of Teweldemedhin et al., unlike this study focused on only rural pregnant women. This finding is explained by the fact that nutritional education intervention received by rural pregnant women in experimental group exposes them to knowledge of healthy and balanced diet for the well being of the fetus and mother during pregnancies. The intervention increase the knowledge of rural pregnant women on nutrients needed for fetus to develop well.

Further finding indicated that there was significant difference in the nutritional knowledge mean scores of rural pregnant women of both experimental and control groups after nutrition education intervention. This supported the finding of Ningi, Abubakar, Abdulkadir and Bello (2023) which indicated that there was significant difference between the knowledge of women in experimental and control groups after nutrition education intervention programme. The agreement in the findings could be explained by the fact that the studies were conducted in the same country where pregnant women are exposed to similar nutritional education. This disagreed with the finding of Teweldemedhin et al. (2021) which revealed that the nutritional knowledge mean scores of pregnant women of both

experimental and control groups after nutrition education intervention did not significantly differ. The disagreement in findings could be attributed to the difference in geographical location and participants of the study. The finding could be explained by the fact that nutritional education intervention to rural pregnant women of experimental groups enabled them to gain more knowledge of better food choice.

The finding of the study indicated that nutritional knowledge mean scores of rural pregnant women of different levels of education in the experimental groups were greater than that of the control group after nutrition education intervention. This agreed with the finding of Aktac et al. (2018) which revealed that rural pregnant women of different levels of education in the experimental group had higher nutritional knowledge mean scores than that of the control group after nutrition education intervention. The agreement in findings could be explained by the fact that only rural pregnant women of different levels of education participated in the studies. The possible explanation for this finding could also be that rural pregnant women of different levels of education in the experimental groups were more able to read and understand health instructions and communicate effectively with health providers than those in control groups that were not exposed to any intervention. The rural pregnant women of different levels of education in the experimental groups were more inclined to learn and acquire more knowledge of healthy eating behaviour.

It was also found that there was significant difference in the nutritional knowledge mean scores of rural pregnant women of different levels of education in both experimental and control groups after nutrition education intervention. This affirmed the finding of Aktac et al (2018) which showed that the difference in the nutritional knowledge mean scores of rural pregnant women of different levels of education in both experimental and control groups after nutrition education intervention was significant. The agreement in findings could be attributed to the fact similar participants (rural pregnant women) were used for the studies. The possible explanation for the finding is that rural pregnant women of different levels of education in experimental groups has the edge over accessing and absorbing more nutrition information than those in control groups which are not exposed to such intervention.

The findings of the study indicated that nutritional knowledge mean scores of rural pregnant women of different occupations in the experimental were greater than that of the control groups after nutrition education intervention. This agreed with the Aktac et al (2018) which revealed that rural pregnant women of different occupation in the experimental group of their study had higher nutritional knowledge mean scores than those of the control groups after nutrition education intervention. The agreement in findings could be explained by the fact that rural pregnant women of different occupations who received nutrition education intervention broaden their knowledge of nutrition than those who were not exposed to such intervention. Different occupations could give rise to a very wide range of

experience and information on nutrition education which could improve nutrition knowledge among rural pregnant women.

It was also revealed that there was significant difference in the nutritional knowledge mean scores of rural pregnant women of different occupations in both experimental and control groups after nutrition education intervention. This was in line with the finding of Aktac et al. (2018) which showed that the difference in the nutritional knowledge mean scores of rural pregnant women of different occupations in both experimental and control groups after nutrition education intervention was significant. This finding might be explained by the fact that nutritional education is received unequally by pregnant women of different occupation in both experimental and control groups

## Conclusion

Based on the findings, it was concluded that nutrition education intervention is effective in improving the nutritional knowledge of rural pregnant women in Enugu State. The rural pregnant women exposed to nutritional education intervention were more knowledgeable of nutrients requirement during pregnancy for their wellbeing and that of their fetus than those who are not exposed to the intervention. The rural pregnant women of different levels of education and occupation in the experimental groups had more knowledge of nutritional education than those in control groups after nutrition education intervention.

## Recommendations

Based on the findings of this study, the following recommendations were made:

1. Health personnel should organize regular interactive sessions for nutritional education intervention to pregnant women during antenatal period in clinic or any health-care facility.
2. Ministry of Health should embark on public enlightenment campaign on nutritional education through mass media to increase knowledge of healthy eating among rural pregnant women of different level of education.
3. Officials of Ministry of Health should pay regular visit to clinics to sensitize and offer nutritional education to rural pregnant women of different occupation to improve their knowledge and practices of eating healthfully during pregnancy.



## REFERENCES

- Aktac, S., Sabuncular, G. Kargin, D. &Gunes, F.E. (2018).Evaluation of nutrition knowledge of pregnant women before and after nutrition education according to Socio-demographic characteristics.*Ecology of Food and Nutrition*, 57(6), 441–445.
- Appiah, P.K., Korklu, A.R.N., Bonchel, D.A., Fenu, G.A. &Yankey, F.W. (2021).Nutritional knowledge and dietary intake habits among pregnant adolescents attending Antenatal Care Clinics in urbancommunity in Ghana.*Journal of Nutrition and Metabolism*, 1(1), 1– 9.
- Attah, B.I.&Osadebe, C.O. (2022). Awareness of nutrition in pregnancy among newly married women in Uzo-Uwani Local Government Area, Enugu State, Nigeria. *International Journal of Home Economics, Hospitality and Allied Research*, 1(2), 221–232.
- Diddana, T.Z., Kelkay, G.N., Dola, A.N. &Sadore, A.A. (2018). Effect of nutrition education based on health belief model on nutritional knowledge and dietary practice of pregnant women in Dessie Town, Northeast Ethiopia: A Cluster randomized control trial. *Journal of Nutrition and Metabolism*, 1(1), 1–10.
- Ezeh, C.J., Maduforo, A.N., Nwamarah, J.U., Chikwendu, J.N.&Okoro, C.E. (2020).Nutrition knowledge and practice among pregnant women in Igbo-Eze south local government area, Enugu State. *Nigeria Journal of Nutritional Sciences*, 41(1), 52–65.
- Fallah, F., Pourabbas, A., Delpisheh, A., Vei-sani, Y. &Shadnoush, M. (2013).Effects of nutrition education on levels of nutritional awareness of pregnant women in Western Iran. *International Journal of Endocrinology and Metabolism*, 11(3), 175–178.
- Girard, A.W.&Olude, O. (2012). Nutrition education and counseling provided during pregnancy: Effects on maternal, neonatal and child health outcomes. *Pediatric and Perinatal Epidemiology*, 26(1), 35–40.
- Gupta, K. (2007). *High blood pressure: Causes, prevention and treatment*. New Delhi: Orient Paperbacks.
- Lim, Z.X., Wong, J.L., Lim, P.Y. & Soon, L.K. (2018).Knowledge of nutrition during pregnancy and associated factors among antenatal mothers.*International Journal of Public health and Clinical Sciences*, 5(1), 117–121.
- Mahlet, Y., Mahlet, B.&Yohannes, A. (2020). Dietary practices and their determinants among pregnant women in Gedeo Zone, Southern Ethiopia: A community-based cross-sectional study. *Nutrition and Dietary Supplements*, 12(1), 267–275.

- Ningi, A.U., Abubakar, Z., Abdulkadir, S. & Bello, Y. (2023). Impact of nutrition education intervention programme on nutritional awareness among pregnant women in Ningi Local Government Area of Bauchi State, Nigeria. *European Journal of Biology and Medical Science Research*, 11(1), 47–56.
- Okueso, S.A. & Anetor, G.O. (2016). Effects of nutrition education among pregnant women using fruits and vegetables for the achievement of MDG5 in Odogbolu LGA, Ogun State. *International Journal of Nursing, Midwife and Health Related Cases*, 2(3), 1–14.
- Teweldemedhin, L.G., Amanuel, H.G., Berhe, S.A., Gebreyohans, G., Tsige, Z. & Habte, E. (2021). Effect of nutrition education by health professionals on pregnancy-specific nutritional knowledge and health dietary practice among pregnant women in Asmara Eritrea: A quasi-experimental study. *BMJ Nutrition Prevention & Health*, 4(1) 181–194.
- Udensi, C.O, Ifenkwe, G.E & Ashiegbu, G.N. (2015). Socio-economic determinants of nutritional status of women beneficiaries of UNICEF-assisted nutrition enhancement programme in Abia State, Nigeria. *Journal of Agriculture and Social Research*, 15(2), 7–16.
- Zelalem, A., Endeshaw, M., Ayenew, M., Shiferaw, S. & Yirgu, R. (2017). Effect of nutrition education on pregnancy specific nutrition knowledge and healthy dietary practice among pregnant women in Addis Ababa. *Clinics Mother Child Health*, 14(3), 1–10.