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

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ABSTRACT

The study investigated the effect of nutrition education on nutritional practices of rural pregnant women in Enugu State. Three research questions guided the study and three 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 Practice Questionnaire (NPQ)''. The instrument was subjected to face validity by three experts, two from the Department of Human Promotion and Public Health Education, and one from the Department of Educational Foundations, Nnamdi Azikiwe University. The reliability of the instrument was established using Cronbach alpha method which yielded coefficient of 0.81. 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 practices and practice mean scores of rural pregnant women 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 practice 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 Chief Medical Directors of Clinics should display posters that educate and create awareness of knowledge and practice of right food choice among rural pregnant women of different levels of education.

Keywords: Nutrition Education, Practices, Rural, Pregnant Women

Introduction

Nutrition is very crucial for survival of human beings throughout their life span. It is more required by pregnant women to support the development of their tissues and the fetus. Attah and Osadebe (2022) asserted that nutrition in pregnancy is the dietary planning and intake which takes before, during and after pregnancy. They added that nutrition in pregnancy is required to support the increased metabolic demand that pregnancy places on a woman's heart, lungs, and other organs. Healthy pregnancy is enhanced by the intake of balanced and suitable nutrition.

A balance and stable diet helps pregnant women to stay healthy and also improve the development of fetus. Ghirmai and Gebreyohannes (2021) opined that a diet which is sufficient in energy, with a variety of nutrients, minerals and vitamins promote the health of the pregnant women and development of the fetus. A balanced diet enhances healthy maternal and fetus weight gain which improve the chance of positive birth outcomes. Nutritional education among pregnant women is one of the crucial preconditions for their intake of balanced and suitable nutrition.

Nutritional education is an intervention programme which is designed to disseminate information on intake of balanced and suitable diet for healthy living. It is the means of raising awareness of the right food choices and nutrition-related behaviour among pregnant women. Hanior, Igbokwe and Dibia (2022) noted that nutrition education is a programme that ensures pregnant women are well-informed about nutrition in pregnancy. Nutrition education is learning experience geared towards disseminating information that enhances healthy eating behaviour for the well-being of individuals. Getachew et al. (2018) maintained that nutrition education programme covers topics such as; importance of good nutrition in pregnancy; essential nutrient required in pregnancy; common food sources needed in pregnancy; healthy weight gain during pregnancy; iron supplementation; other nutritional concern; food cravings and other aversions and alcohol consumption in pregnancy. It is also an interventional programme and activity that equips pregnant women with sound knowledge, requisite skills and positive attitudes towards diet and right food in-take to enhance their wellness and development of the fetus. Ningi, Abubakar, Abdulkadir and Bello (2022) asserted that nutrition education is a programme that improves dietary intakes during pregnancy by promoting a balanced diet. Furthermore, Ningi et al. (2023) stressed that it also promotes healthy diet and lifestyle during pregnancy by encouraging in-take of adequate daily iron, folic acid intake, and other pregnancy-specific foods. Nutrition education could help pregnant women acquire information that might help them engage in healthy nutritional practices.

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 fetus. 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 in Enugu State could be depended on their demographic

variables. The maternal demographical information may influence the nutrition practices among pregnant women in Enugu State. Such demographic variables are level of education and occupation. Mahlet, Mahlet and Yohannes (2020) pointed out that pregnant women with high level of education have more chances to acquire nutrition and other health-related information from different sources like leaflets, magazines and other media to improve their nutritional practices. Literate pregnant women are likely to engage in good nutrition practices when compared to illiterates (Abute, Beyamo, Erchafo, Tadesse, Sulamo & Sadoro, 2020). Occupation could be significant factor that influences nutrition practices of rural pregnant women. Civil servants are more likely to engage in nutritional practices than traders and house wives. The reason might be that civil servants are more likely to get access information about diet during pregnancy (Abute et al, 2020). Also, pregnant women who work in the health sector may constantly get information that could influence their nutrition practices.

Pregnant women in rural areas in Enugu State tend be limited to the in-take of certain kinds of food probably due to cultural beliefs and poor knowledge regarding various healthy diet to be eaten during pregnancy. Ezeh, Maduforo, Nwamarah, Chikwendu and Okoro (2020) reported that nutritional practices of pregnant women in Enugu State are poor and they take food with low nutrients. In the same vein, Attah and Osadebe (2022) noted 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. Excessive in-take of some nutrients among rural pregnant woman may be the contributing factors to malformations or health problems in the fetuses among rural pregnant women in Enugu State. The poor nutritional practices among pregnant women seem to contribute to the risk of developing some complications in pregnancy such as low birth weight, over-weight, miscarriages, preterm delivery, and insufficient breast milk production. It also leads to iron-deficiency anaemia and other nutrients required for normal metabolism which may contribute to maternal mortality among rural pregnant women in Enugu State. This prompted the investigation into the effect of nutrition education on nutritional 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 nutritional practices of rural pregnant women in Enugu State. Specifically, the study determined:

1. The mean scores of nutritional practice of rural pregnant women in both experimental and control groups, before and after nutrition education intervention.
2. The mean scores of nutritional practice 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 practice 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:

1. What are the nutritional practice mean scores of rural pregnant women, in the experimental and control groups after nutrition education intervention?
2. What are the nutritional practice 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 practice 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 practice mean scores of rural pregnant women in both experimental and control groups after nutrition education intervention.
2. There is no significant difference in the nutritional practice 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 practice mean scores of rural pregnant women of different occupation in both experimental and control groups after nutrition education intervention.

Research Method

Quasi-experimental research design was adopted for this study. Specifically, it used pre-test, post test control group design. The study was conducted in Enugu State of Nigeria, which is one of the states in the South-Eastern part of Nigeria. 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 was drawn for the study. In the second stage, purposive sampling technique was used to draw two health centres 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 from the two sampled LGAS. In the third stage, simple random sampling technique was used to draw two intact health centres for the study.

The instrument for data collection was ‘‘Nutritional Practice Questionnaire (NPQ)’’ that has been developed based on the programme of the study. The instrument was developed by the researcher based on review of related literature. NPQ is made up of two

sections namely A and B. Section A consisted of demographic variable of the respondents such as ages, education levels, occupations and marital status. Section B contained 21 items structured on a four-point rating scale of Strongly Agree (SA), Agree (A), Disagree (D); Strongly Disagree (SD) and weighted 4, 3, 2 and 1 respectively. The instrument was subjected to face 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, Nnamdi Azikiwe University, Awka. The validators' suggestions were put into consideration in the production of the final copy of the instrument. The test items of NPQ 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 will used for the study in Enugu State. The instrument was administered to the respondents by the researcher and research assistants on face-to-face basis and collected on the spots. Cronbach alpha method was used for the Nutritional Practices Questionnaire because the items are polytomously scored. The reliability of the instrument was found to be 0.81. This is in line with Creswelll (2009) who advocated that coefficient value of 0.75 or above is adequate for establishing the reliability of a research instrument.

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. The researcher and research assistants carried out weekly visit to the designated villages. 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. Experimental groups were taught using lesson plan on Nutrition Education. The actual experiment was conducted by the research assistant that is the health personnel that have been coached by the researcher. The abilities of control and experimental control are similar due to the fact that they are in the same area, attend similar clinics, go to same markets, mix up together and share views. The scripts were collected, marked and scored.

The following measures were employed to control some of the extraneous variables in this study. The intact registered pregnant women in each health centre was be used for the study. Analysis of Covariance (ANCOVA) was employed for data analysis 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 study lasted for six weeks to control of the effect of pre-test on post-test. The pre-test was administered in the first week, thereby allowing extra eight weeks before the post-test. Also the post-test items were reshuffled. The researcher limited the experimental period to nine weeks to minimize the effect on pregnant women growing older**.** 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.

Presentation of Results

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

Table 1: Nutritional Practice 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 Diff.
Experiential Group	478	12.11	7.54	31.67	4.12	19.56
Control Group	373	13.09	6.10	22.91	5.10	9.82

As shown in table 1, the pregnant women in experimental groups exposed to nutrition education had pre-test nutritional practice mean score of 12.11 with standard deviation of 7.54, their posttest nutritional knowledge mean score was 31.67 with 4.12 value of standard deviation and gain mean of 19.56. On the other, those in the control groups had pre-test nutritional practice mean score of 13.09 with standard deviation of 6.10, their posttest nutritional practice mean score was 22.91 with 5.10 value of standard deviation and 9.82 gain mean. The spread of score of the women in the posttest was more homogenous than those in the experimental groups because their SD score of 4.12 was smaller than that of the SD score of 5.10 for those in control groups. The difference in mean gain of nutritional practice difference between the experimental group and control group was 9.74 in favour of the experimental group. The result indicated that the nutritional practice mean scores of rural pregnant women in the experimental groups were higher than that of those control groups after nutrition education intervention.

Research Question 2: What are the nutritional practice 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 Practice 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 Diff
Experiential Group	Primary	243	10.11	4.32	12.90	2.32	2.79
	Secondary	201	16.76	6.87	28.11	4.86	11.35
	Tertiary	34	19.33	5.06	32.99	2.00	13.66
Control Group	Primary	176	9.08	3.44	11.05	2.24	1.97
	Secondary	155	14.16	5.05	17.76	2.45	3.60
	Tertiary	42	19.01	7.11	28.07	3.03	9.06

Table 2 shows that the pretest nutritional practice mean scores of rural pregnant women in the experimental groups who had primary, secondary and tertiary education were 10.11, 16.76 and 19.76 respectively, while their posttest nutritional practice mean scores were 12.90, 28.11 and 32.99 respectively with mean gain of 2.79, 11.35 and 13.66 respectively. The results show that the pregnant women in the experimental groups who attended tertiary institution had greater nutritional practice mean score than those who had primary and secondary education.

The pretest nutritional practice mean scores of rural pregnant women in the control groups who had primary, secondary and tertiary education were 9.08., 14.16 and 19.01 respectively, while their posttest nutritional practice mean scores were 11.05, 17.76 and 28.07 respectively with mean gain of 1.97, 3.60 and 9.06 respectively. The results showed that the pregnant women in the control group who attended tertiary institution had greater nutritional practice 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 practice mean score after nutrition education intervention than those who attended primary and secondary schools. The result shows that the nutritional practice mean scores of rural pregnant women of different levels of education in the experimental groups are greater than that of those in control groups after nutrition education intervention.

Research Question 3: What are the nutritional practice 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 Practice 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.
Experiential Group	Unemployed	44	3.16	2.77	4.99	1.11	1.83
	Students	81	12.14	4.29	20.32	2.11	8.18
	Farmers	156	6.84	3.10	12.13	1.12	5.29
	Traders	142	8.03	2.07	15.19	1.01	7.16
	Civil Servants	55	17.13	8.18	30.01	4.33	12.88
Control Group	Unemployed	51	3.98	2.76	4.12	1.33	0.14
	Students	71	11.45	6.81	15.64	4.55	4.19
	Farmers	123	9.90	3.87	12.88	3.22	2.98
	Traders	104	10.11	5.76	13.02	3.19	2.91
	Civil Servants	24	13.13	7.99	22.98	2.07	9.85

Table 3 indicated that the pretest nutritional practice mean scores of rural pregnant women in the experimental groups who are unemployed, students, farmers, traders and civil servants were 3.16, 12.14, 6.84, 8.03 and 17.13 respectively, while their posttest nutritional practice mean scores were 4.99, 20.32, 12.13, 15.19 and 30.01 respectively with mean gain of 2.77, 4.29, 3.10, 2.07 and 8.18 respectively. The results showed that the pregnant women of the study in the experimental groups who were civil servants yielded greater nutritional practice mean score than those in other occupations.

The pretest nutritional practice mean scores of the women in the control groups who were unemployed, students, farmers, traders and civil servants were 3.98, 11.45, 9.90, 10.11 and 13.13 respectively, while their posttest nutritional knowledge mean scores were 4.12, 15.64, 12.88, 13.02 and 22.98 respectively with mean gain of 0.14, 4.19, 2.98, 2.91 and 9.85 respectively. The results showed that the pregnant women in the control groups who were civil servants had greater nutritional practice 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 practice mean score after nutrition education intervention than those who are different occupation. The result showed that the nutritional knowledge mean scores of the women of different occupations 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 practice mean scores of rural pregnant women in both experimental and control groups before and after nutrition education intervention.

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Table 4: ANCOVA Summary of Nutritional Practice Mean Scores of Rural Pregnant Women in Both Experimental and Control Groups After Nutrition Education Intervention.

Source of variation	SS	Df	MS	F	P-value	Decision
Corrected Model	20047.446	2	10023.72	433.12	.000	
Intercept	73215.132	1	73215.13	3108.81	.000	
Pretest	.287	1	.29	.089	.906	
Group	20154.467	1	20154.47	810.03	.000	Sig.
Error	17061.76	848	20.12			
Total	401346.010	851				
Corrected Total	21628.233	850				

Table 4 shows that at 0.05 level of significance, 1df numerator and 850 df denominator, the calculated F is 810.03 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 practice mean scores of rural pregnant women in both experimental and control groups after nutrition education intervention.

Hypothesis 2: There is no significant difference in the nutritional practice 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 Practice 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	112.168	2	56.08	1.07	.353	
Intercept	22398.561	1	22398.56	1082.14	.000	
Pretest	12.991	1	12.99	.58	.450	
Group	28.388	1	28.39	1.38	.038	Sig.
Error	17511.2	848	20.65			
Total	108900.000	851				
Corrected Total	890.909	850				

Table 5 shows that at 0.05 level of significance, 1df numerator and 850 df denominator, the calculated F is 1.38 with P-value of .038 which is greater less than 0.05. Thus, the null hypothesis was rejected. Therefore, there was significant difference in the nutritional practice mean scores of rural pregnant women of different levels of education in both experimental and control groups after nutrition education intervention.

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Hypothesis 6: There is no significant difference in the nutritional practice mean scores of rural pregnant women of different occupation in both experimental and control groups before and after nutrition education intervention.

Table 6: ANCOVA Summary of Nutritional Practice Mean Scores Of Rural Pregnant Women of Different Occupation in Both Experimental and Control Groups Before and After Nutrition Education Intervention.

Source of variation	SS	Df	MS	F	P-value	Decision
Corrected Model	20211.650	2	10105.83	443.35	.00	
Intercept	65143.223	1	65143.22	3411.51	.00	
Pretest	.309	1	.31	.02	.91	
Group	20565.489	1	20565.49	839.12	.00	Sig.
Error	20640.32	848	24.34			
Total	424567.009	851				
Corrected Total	21723.381	850				

Table 6 shows that at 0.05 level of significance, 1df numerator and 850 df denominator, the calculated F is 839.12 with p-value of 0.00 which is less than 0.05. Thus, the null hypothesis was rejected. Therefore, there was significant difference in the nutritional practice 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 revealed that nutritional practice mean scores of rural pregnant women, in the experimental groups were greater than that of the control groups after nutrition education intervention. This agreed with the finding of Ghirmai and Gebreyohannes (2021) which revealed that pregnant women in the experimental groups had higher nutritional practice mean scores than those in control groups after nutrition education intervention. The agreement in the findings could be attributed to the fact that nutritional education enables rural pregnant women in the experimental group to gain knowledge which they could apply in their nutritional practices.

It was also revealed that there was significant difference in the nutritional practice mean scores of rural pregnant women in both experimental and control groups after nutrition education intervention. This disagreed with the fining of Teweldemedhin et al. (2021) which revealed the nutritional practice mean scores of pregnant women of both experimental and control groups after nutrition education intervention did not significantly differ. The dissimilarity in time span could account for the disagreement in the findings.

It was found that nutritional practice mean scores of rural pregnant women of different levels of education in the experimental were greater than those of the control groups after nutrition education

intervention. This was in line with the finding of Hassoon and Zeidan (2020) which showed that there was a difference in the nutritional practice mean scores of rural pregnant women of different levels of education in the experimental and control groups after nutrition education intervention in favour of the experimental groups. The use of rural pregnant women who might have similarity in educational level could explain the agreement between the findings of the studies. The educational level and additional nutritional education intervention received by rural pregnant women in the experimental group could account for the greater nutritional practices than that of the control groups. Rural pregnant women in the experimental groups who were educated might be able to read and practice instruction received after nutritional educational intervention.

The result of this study also showed that there was significant difference in the nutritional practice mean scores of rural pregnant women of different levels of education in both experimental and control groups after nutrition education intervention. This agreed with the finding of Hassoon and Zeidan (2020) which revealed the difference in the nutritional practice mean scores of rural pregnant women of different levels of education in both experimental and control groups after nutrition education intervention was statistically significant. The similarity in practices of the subjects of the studies could be connected to the agreement in the findings.

The result of the study revealed that nutritional practice mean scores of rural pregnant women of different occupation in the experimental groups were greater than that of the control groups after nutrition education intervention. This agreed with the finding of Ghirmai and Gebreyohannes (2021) which revealed that pregnant women of different occupation in the experimental groups had higher nutritional practice mean scores than those in control groups after nutrition education intervention. The agreement in the findings could be attributed to time span as the two studies were recently done. Rural pregnant women of different occupation in the experimental groups might afford them the opportunity to practice nutritious feeding habits after nutritional education interventions than those in the control groups.

The result of the study showed that there was significant difference in the nutritional practice mean scores of rural pregnant women of different occupation in both experimental and control groups after nutrition education intervention. This affirmed the finding of Ghirmai and Gebreyohannes (2021) which revealed that the difference in the nutritional practice mean scores of pregnant women of different occupation in both experimental and control groups after nutrition education intervention was statistical significant

Conclusion

Based on the findings, it was concluded nutrition education intervention is effective in improving the practices of rural pregnant women in Enugu State. The rural pregnant women exposed to nutritional education intervention practiced adequate dietary in-take for their wellbeing and that of

their fetus than those who are not exposed to the intervention. The rural pregnant women of different demographic variables in the experimental groups had more engage in practices 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. State Ministry of Health develop hand book on nutritional education and make it available to health professionals to guide them in administering nutritional education intervention during antenatal periods.
2. Chief Medical Directors of Clinics should display posters that educate and create awareness of knowledge and practice of right food choice among rural pregnant women of different levels of education
3. Chief Medical Directors of Clinics should organize annual workshops on nutritional education for rural pregnant women of different occupation to enable them update their knowledge and skills of managing their nutrients during pregnancy.

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