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Assessment of knowledge, attitude and practice of pregnant women regarding maternal nutrition: A cross-sectional study from Ebonyi State, Nigeria

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Abstract

***Background**: Nutrition has a major effect on human health throughout life. This is most significant for expectant mothers as proper nutrition is one of the methods of achieving maternal and fetal safety or wellbeing. Pregnancy is one of the most vulnerable stages of a woman's life cycle. Hence this study seeks to assess the knowledge, attitude and practice of pregnant women regarding maternal nutrition in Ebonyi state Abakaliki, Nigeria.*

***Methods**: This study adopted a cross-sectional descriptive survey performed on 138 research participants within the age range below 20 years and above 35 years. Data used in this study were collected from two sources, the traditional literature review process and questionnaires respectively. Analyses of the data collected from the questionnaires for the study were analyzed using SPSS statistical analytical software.*

***Results**: The age distribution of respondent show that 18.8% of the respondents fell within the age bracket of 20-24 years, 30% fell under 25-29 years, 28.6% fell under 30-34 years while above 35 years recorded 22.6%. The marital distribution of respondents showed that 8.6% of the respondents were single, 88.3% were married, and 2.3% were cohabiting while 0.8% fell under the others. Three-point-eight percent of the respondents had no formal education, 3.8% of them had primary education, followed by another 24.6% that had secondary education, 67.8% of the respondents had tertiary education. Forty-nine-point-two percent of the respondents were employed by the civil service, 16.4% were unemployed and 7.4% of the respondents were daily labourers while 27% were businesswomen. The mean, median, and range calculated from the study show that the knowledge and practice of the respondents were adequate while attitudes were inadequate.*

***Conclusion**: The respondents had good knowledge, and good practice but a poor attitude toward maternal nutrition. Therefore, advocacy, communication, and social mobilization activities in the study area should be intensified to improve pregnant women's attitudes toward maternal nutrition.*

KEYWORDS: ASSESSMENT, KNOWLEDGE, ATTITUDE, PRACTICE, MATERNAL, NUTRITION, PREGNANT WOMEN.

Introduction

Nutrition as a science interprets the interaction of nutrients and other substances in food with the maintenance, growth, reproduction, health and disease of a living organism. It includes

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taking food material, mastication process, digestion process and ejection process of these food materials (Daba et al., 2013). Nutrition is a key nitty-gritty of existence, health and human growth and development (World Bank, 2006). The entirety of the human race needs a minimal amount of nutrients for better physiological function. There are approximately 40 essential health nutrients. If the human body has nutrient deficient, the body becomes vulnerable and susceptible to harm (Collins, 2007). The deficiency of nutrients in food may have a certain effect on women during pregnancy.

Pregnancy requires sufficient energy and nutritional intake by women to meet maternal and fetal needs and other hormonal changes that occur during pregnancy, a good nutritional balance is essential to ensure sufficient energy intake for proper development and growth of the fetal without the fetal acting as a parasite to the host (mother) (Subarnalata and Panda, 2006). The survival of infants and children is affected by the poor health and nutrition of women and the lack of self-care or poor attitude during pregnancy and childbirth thereby compromising the child's health (Abdella, 2010). Moreso, nutrition below the gold standard requirement for pregnant women has the most damaging effect on the fetal during pregnancy and in the first two years of life after birth, by impeding the child's health, brain development, intelligence, educability, and productivity at large and most times irreversible (Shekar et al., 2006).

The pregnant and lactating woman's food composition should include a substantial increase in calories, protein, calcium, folic acid, iodine and iron among others. Pregnant women that are likely affected by nutritional deficiencies are overweight women, underweight women, women having a severe nutritional related illness, women who use tobacco, consume alcohol or do drugs, underage girls, women with poor socioeconomic background, women with chronic illnesses and comorbidities (Edris et al., 2005). Malnutrition which is a nutritional deficiency can be transferred from mother to fetal during pregnancy and birth, therefore the nutritional condition of women is very important to take into consideration during antenatal care to curtail the harmful effects of malnutrition (Cetin and Laoreti, 2015). According to the World Health Organization (2021), asserted that during reproductive age and pregnancy, most women do not get enough micronutrients in their food intake and are unaware of how much nutritional status impacts pregnancy and birth outcomes. In Nigeria, women are primary caregivers and are responsible for producing and preparing food for the household, so the knowledge of good nutrition or the lack of nutritional knowledge can affect the health and nutritional status of the entire household.

Studies from Nigeria have revealed a high prevalence of both undernutrition and overnutrition, as well as nutrient deficiencies, including iron, folate, vitamin D and vitamin A amongst pregnant women (Senbanjo et al., 2013; Berti et al., 2016). According to Nigeria Demographic and Health Survey (2013), 11% of women of reproductive age are thin or undernourished (BMI less than 18.5kg/m2), 17% of women are overweight (BMI of 25–29 kg/m2), and 8% are obese (BMI of 30 kg/m2 or above). Overweight is most prevalent in Lagos indicating 44% (NPC and ICP, 2013) Consequently, obstetric complications such as hypertension, anaemia, neural tube defects, night-blindness, low birth weight and maternal and Prenatal mortality are common. In Lagos State, the maternal mortality rate is 650 deaths per 100 000 live births (Lindsay, Gibney and McAuliffe, 2012) Many of these deaths have malnutrition as the predisposing factor, either directly or indirectly.

Previous studies indicate a low rate of knowledge regarding nutrition during pregnancy in a certain part of the world (Daba et al., 2013; Mitra et al., 2012). The Practice of following a vegetarian diet during pregnancy is low in the previous studies conducted in America (the Federal Democratic Republic of Ethiopia, 2013). A plethora of studies and research proposals focus on maternal health but less attention is given to maternal nutrition in this study area (Berg et al., 2011) but similar studies have been conducted in Western Kenya and Northern

Nigeria however few studies have been done in South Western and South-East Nigeria. It is hoped that in doing this study, it will shed more light on the knowledge, attitude and practice of good nutrition among pregnant women in Ebonyi State and provide a basis for developing nutrition education programs and interventions that will improve quality of life and reduce morbidity, mortality and health-care costs.

It is clear that maternal nutrition is crucial in reducing maternal and infant morbidity and mortality, but no study has been conducted to assess the nutritional knowledge, attitude and practices of pregnant mothers in the study area. Therefore, this study aimed to assess the nutritional knowledge, attitude, and practices of pregnant women regarding maternal nutrition in Ebonyi State, Nigeria.

Statement of the Problem

Pregnancy is a very critical stage in a woman's life where her actions and inactions could affect the fetus significantly. Clinical facts indicated high and increasing maternal and child death of which most deaths are linked to nutritional deficiency or poor nutrition management during pregnancy (UNICEF, 2009). Nutritional deficiency is one of the leading causes of death not just among pregnant women, 4,000,000 newborns die within 28 days of birth in developing countries (Daba et al., 2013). The Millennium Development Goals and the Sustainable Development Goals are all focused on maternal health promotion and global health issues hence, ensuring a healthy society begins with promoting maternal nutrition education in schools, rural areas and communities. Maternal nutrition during pregnancy is crucial in reducing maternal mortality and fetal mortality which are the core objectives of the World Health Organization. Therefore, assessing the knowledge, attitude and practices of pregnant women regarding maternal nutrition become necessary in the study area.

Aim of the Study

To assess the knowledge, attitude and practices of maternal nutrition by pregnant women in Ebonyi State. Specifically,

1. Describe the socio-demographic characteristics of the pregnant women in Abakaliki Metropolis.
2. Appraise the knowledge of maternal nutrition amongst pregnant women in the Abakaliki metropolis.
3. Assess the attitudes of pregnant women in Abakaliki Metropolis regarding maternal nutrition.
4. Assess the practices of maternal nutrition by pregnant women in Abakaliki Metropolis.

Materials and Methods

Research Design

The design used was a cross-sectional descriptive study design.

Sources of Data

Data used in this study were collected from research respondents through questionnaires and others through reviewed literature.

Study Population and Sample

The study population were pregnant women of Abakaliki Metropolis, Ebonyi State, Nigeria. Respondents were met at homes, churches, markets, streets, schools and hospitals. A total of

138 respondents were used for the study within the age range of lesser than 20 years or above 35 years. A purposive and convenient sampling technique was used for the study. A total of 144 questionnaires were administered and 138 were returned which represents a 95.8% return. The sampling size was statistically determined using G-power software (version 3.1).

Inclusion criteria

The respondents were pregnant women who were at least a month pregnant and currently living in Abakaliki Metropolis Ebonyi State for at least 6 months to be considered a resident.

Exclusion criteria

Women who are not pregnant or less than a month old pregnant and are not residents of Abakaliki Metropolis Ebonyi at the time of the study.

Data Collection

Data collectors were recruited and trained for this purpose, the questionnaires were administered in the morning, afternoon and evening depending on the comfort of the research respondents. Data collected were analyzed using a statistical software package (SPSS version 10), frequency and mean were used for interpretation of a questionnaire that consist of knowledge, attitude and practice questions. The questionnaire was prepared in English and administered in English because 95% of the residents of the Abakaliki metropolis are literates, but other measures were taken such as using plain and simple sentences, we avoided the use of jargon and the data collectors served as local interpreters. The questions on the questionnaires included information on the socio-demographic characteristics of the respondent, knowledge, attitudes, and practice on maternal nutrition of pregnant women. Questions on the knowledge, attitude and practice part were each rated and a total score was obtained. The median and mean score was then computed. Therefore, those with a total score equal to or below the mean were classified as having poor knowledge, poor attitude and poor practice whereas those above the mean were considered to have good knowledge, attitude and practice.

Informed consent

Informed Consent Documents (ICD) containing the Participants Information Sheet and Informed Consent Form were prepared and handed over to prospective research participants. Participants were allowed to ask questions and clarifications were made. After getting consent from the participants, the questionnaire was handed to them and a copy of the signed informed consent sheet was also given to them for keeping. Privacy and confidentiality of participants' information were assured and safety measures were provided. The study was conducted only after due approval from the Ethics committee.

Research Instrument

The Instrument for data collection was the questionnaire which was structured to assess the knowledge, attitude and practice (KAP) of respondents. The questions were structured and answered by using the five-point Likert scale ranging from "strongly disagree" (SD), "disagree" (D), "don't know/ unsure" (DK), "agree" (A), "strongly agree" (SA). The instrument was presented in four sections A-D. Section A comprised bio-demographic data, section B comprised the knowledge questions, section C was the attitude questions and D was the practice questions. Section B-D contained a total of 23 questions. Points (1–5) were attached to each column ranging from SD to SA respectively. One hundred and forty-three questionnaires were administered by the researcher and research assistants and 138 were filled and returned, though some questions were not attempted by a few of the respondents.

Validation of Research Instrument

The data collection instrument was subjected to the review and critical examination of capable hands in the Health Systems and Health Policy field to ensure the relevance of contents and effectiveness to the problem under study. Corrections were made where necessary and irrelevant items were discarded.

Analytical

Analysis of the data collected for the study was done using the measures of central tendency (mean, median and mode). The formula for the analytical tool for the mean is:

Mean (𝕞) = ($\Sigma \mathbf{x} \div N$); Σ = summation, X = scores, *N* = number of scores

Results

This chapter deals with the analysis and presentation of data. It is organized based on research questions. The information is depicted in tables and the interpretations come after each table.

Respondents' Characteristics

Table 1 shows that 18.8% of the respondents fell within the age bracket of 20–24 years, 30% fell under 25–29 years, and 28.6% fell under 30–34 years while beyond 35 years records only 22.6%.

Table 1: Age distribution of respondents

Category (Age in Years)	Frequency	Percentage
Below 20	0	0.0
20–24	25	18.8
25–29	40	30.0
30–34	38	28.6
Above 35	30	22.6
Total	**133**	**100**

Table 2 shows that 8.6% of the respondents were single, 88.3% were married, 2.3% was cohabiting and 0.8% was unspecified.

Table 2: Marital distribution of respondents

Marital Status	**Frequency**	**Percentage**
Single	11	8.6
Married	113	88.3
Cohabiting	3	2.3
Others	1	0.8
Total	128	100

Table 3 shows that 3.8% of the respondents had no formal education, 3.8% had primary education, 24.6% had secondary education and 67.8% had tertiary education.

Table 3: Educational level of respondents

Educational level	**Frequency**	**Percentage**
No formal	5	3.8
Primary	5	3.8
Secondary	32	24.6

Tertiary	88	67.8
Total	130	100

From Table 4 it can be seen that 49.2% of the respondents were civil servants, 16.4% of them were unemployed, followed by another 7.4% as daily labourers, 27.0% were business. The implication is that most people used for this study are civil servants.

Table 4: Occupational Status of the respondents

Occupation	Frequency	Percentage
Civil servant	60	49.2
Unemployed	20	16.4
Daily labourer	9	7.4
Business	33	27.0
Total	122	100

The figures below are a summary of the demographics using the pie chart, indicating the frequency and percentage distribution of the research respondents.

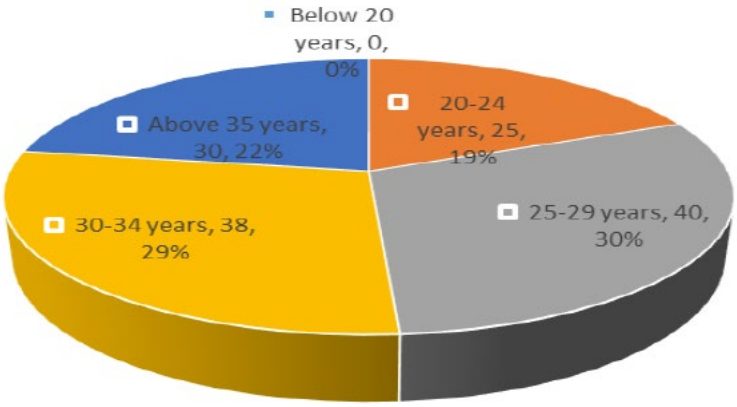

Figure 1: Age distribution of respondents

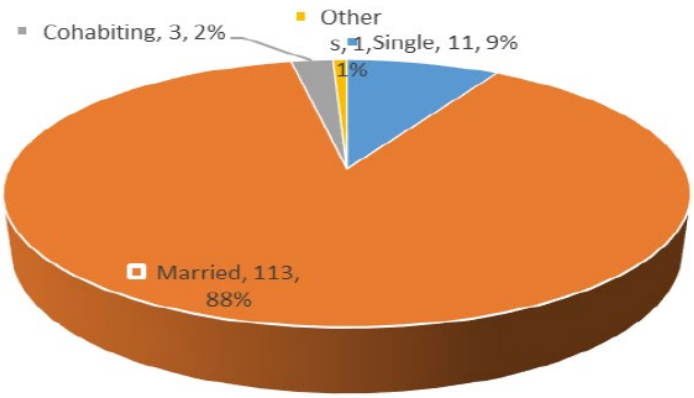

Figure 2: Marital distribution of respondents

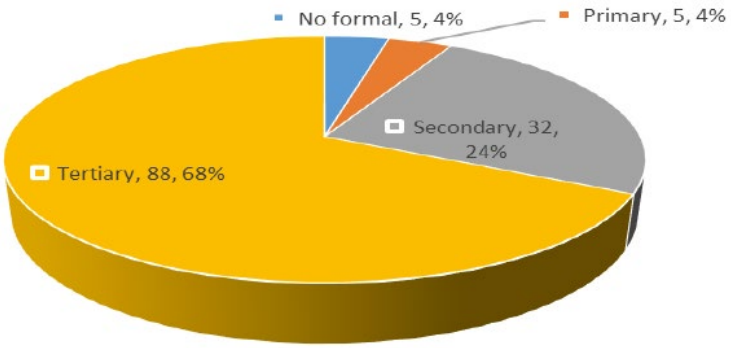

Figure 3: Education level of respondents

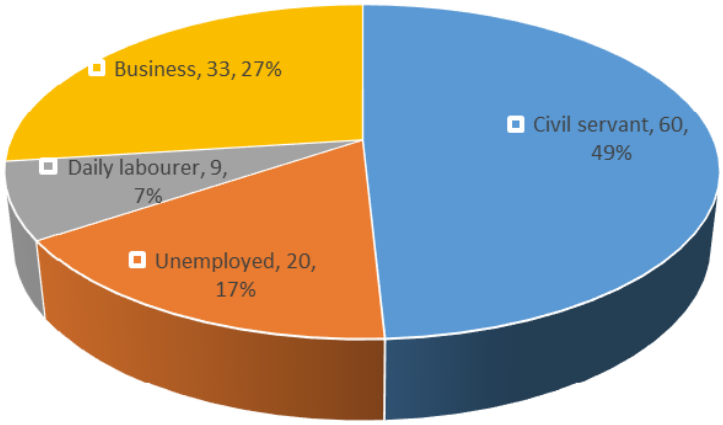

Figure 4: Occupational status of respondents

Table 5 reveals that Q5 had a mean of 3.47 which is below the cut-off point of 3.50. The respondents did not agree that Q5 is a good source of iron needed during pregnancy. It suggests that all other questions in table 5 with a mean of 3.50 and above are common knowledge among pregnant women in the Abakaliki metropolis.

Table 5: Pregnant women's knowledge of maternal nutrition

Likert Scale / Indicators	1	2	3	4	5	Total	Range	Median	Mean
Q1(Energy Source)	12	2	6	50	65	135	1-5	4	4.14
Q2(Iodine Source)	12	12	25	54	23	124	1-5	4	3.53
Q3(Protein Source)	8	8	23	53	41	131	1-5	4	3.89
Q4(Mineral Source)	9	3	12	40	68	132	1-5	4	4.17
Q5(Iron Source)	8	13	40	49	21	131	1-5	4	3.47
Q6(Vitamin Source)	5	10	26	61	32	134	1-5	4	3.78
Q7(Water as Nutrient)	9	11	13	60	36	129	1-5	4	3.79

Table 6 shows that pregnant women had a good attitude toward maternal nutrition during pregnancy in Q8 with a mean of 4.12, Q10 with a mean of 3.95, Q16 with a mean of 3.65 and Q17 with a mean of 4.02 respectively, while Question 9, 11, 12, 13, 14, 15 with mean of 2.83, 3.07, 2.13, 2.0, 1.94 and 3.01 respectively which is below the cut-off point of 3.50 were all indicators of poor attitude of pregnant women in the Abakaliki metropolis regarding maternal

nutrition. This implies that the indicators in Questions 9, 11, 12, 13, 14 and 15 need intervention.

Table 6: Pregnant women's Attitude toward maternal nutrition

Likert Scale	1	2	3	4	5	Total	Range	Median	Mean
Indicators									
Q8(Moderate Eating)	6	5	11	53	54	129	1–5	4	4.12
Q9(Meal Preparation)	25	42	8	38	16	129	1–5	2	2.83
Q10(Home Gardening)	2	15	13	59	43	132	1–5	4	3.95
Q11(Good Nutrition Habit)	12	47	15	40	20	134	1–5	3	3.07
Q12(Vegetarianism)	43	60	4	19	6	132	1–5	2	2.13
Q13(Cooking Methodology)	66	42	6	12	12	138	1–5	2	2.0
Q14(Food Supplements)	55	50	14	9	5	133	1–5	2	1.94
Q15(Processed Food)	18	32	28	42	14	134	1–5	3	3.01
Q16(Good hygiene)	11	10	32	46	37	136	1–5	4	3.65
Q17(Caffeine and Alcohol Intake)	11	5	16	43	60	133	1–5	4	4.02

Table 7 above reveals that pregnant women practice good nutrition during pregnancy for Q18 with a mean rating of 3.88, Q19 with a mean rating of 3.77, Q20 with a mean rating of 3.80, Q21 with a mean rating of 3.86, and Q23 with a mean rating of 3.66. Q22 shows a weak mean of 3. 30, which is below the cut-off point of 3.50, having a median of 3 and a range of 1–5. This implies that the extent to which three to four servings of dairy food are consumed per day such as milk, yoghurt and cheese during pregnancy at the time of data collection is low and not commonly practised amongst pregnant women in Abakaliki Metropolis.

Table 7: Pregnant women's Practice regarding maternal nutrition

Likert Scale	1	2	3	4	5	Total	Range	Median	Mean
Indicators									
Q18(Protein Diet)	2	10	22	62	33	129	1–5	4	3.88
Q19(Folic acid Diet)	5	13	18	60	30	126	1–5	4	3.77
Q20(Calcium Diet)	3	10	23	64	27	127	1–5	4	3.80
Q21(Carbohydrate Diet)	1	9	33	59	35	137	1–5	4	3.86
Q22(Diary Food)	9	18	37	52	11	127	1–5	3	3.30
Q23(Iodine Food)	7	11	20	70	20	128	1–5	4	3.66

Discussion

This study was designed to assess the knowledge, attitude and practice of pregnant women regarding maternal nutrition in Ebonyi State. Eighty-eight-point-three percent of the respondents were mostly married from the age range of 25–29 (30%) and 30–34 (28.6%) as shown in Tables 1 and 2. Tables 3 and 4 revealed that most of the research respondents had tertiary education (67.8%) and are mostly civil servants (49.2%). There is a statistically significant association between socio-demographic characteristics such as age, level of education and job type regarding maternal nutritional knowledge.

Findings in Table 5 showed that most of the respondents had adequate knowledge of maternal nutrition except for a few who did not know that dark leafy greens such as spinach, kale, broccoli, potatoes, prunes and figs are good sources of iron. Iron intake needs to be increased during pregnancy because of the growth of the fetus, placenta and the expansion of maternal

blood volume. Iron supplements are often necessary during pregnancy although milk, fruits particularly citrus fruits and vegetables in adequate amounts can supply all the necessary vitamins (Daba et al., 2013). In the same vein Fasola et al., (2018) observed that the low intake of fruits and vegetables may be due to their inability to afford the food which can lead to scarcity, deficiency and underutilization of such nutrients by the body. Low fruit and vegetable consumption have been reported to consistently have a higher prevalence among the most disadvantaged groups of people within a community (Hosseinpoor et al., 2012). The prevalence of low fruit and vegetable consumption tended to increase with age and decrease with income (Hall, Moore, Harper and Lynch, 2009) Studies from mainly developing countries showed that 78.4% of women consumed less than the minimum recommended five daily servings of fruits and vegetables (Hall et al., 2009). The daily consumption of fruits and vegetables by at least half of the respondents is higher than those in another study done in Maiduguri, Borno State, Nigeria where 26.53% of the respondents reported eating fruits and vegetables daily (Kever et al., 2015).

Table 6 reveals that pregnant women had a poor attitude regarding maternal nutrition. Questions 9, 11, 12, 13, 14, 15 have a mean score of 2.83, 3.07, 2.13, 2.0, 1.94 and 3.01 respectively lying below the cut-off point of 3.50. There was no statistically significant association between the knowledge of the respondents and their attitude towards good nutrition in the study area. This is not in keeping with a previous study done in Somolu Local Government, Lagos State and Manzini, Swaziland in which nutritional knowledge and attitude were significantly associated (Sakhile and Shu-Jan, 2014; Fasola et al., 2018). Igba (2008) and Igba (2013) noted that pregnant women should attend an antenatal clinic where nutrition education is done. Nutrition education influences nutrition security through the acquisition and allocation of behaviours related to food, health and sanitation (FAO, 1992, 1997). Since women are directly responsible for ensuring household nutrition security, it is vital to provide them with appropriate nutrition education and awareness programmes.

Question 22 on Table 7 indicated that three to four servings of dairy foods a day for example milk, yoghurt and cheese during pregnancy are not been commonly practised by pregnant women in Abakaliki Metropolis, Ebonyi State. Pregnant women have an increased demand for new tissues because of fetal development and growth. The increased protein need for tissue development can be met through drinking plenty of milk, eating meat and animal products or by-products and plant protein such as soybeans (Anyakoha, 2015). Pregnant women need an increased amount of protein to provide amino acids for fetal development, blood volume expansion and growth of fetal and maternal tissue, such as the breast and uterus. Protein intake of approximately 71grams/day is needed during the second half of pregnancy (Murrcy and Kinney, 2014).

Conclusion

Based on the findings of the present study, it can be concluded that pregnant women had good nutritional knowledge and practices of maternal nutrition but poor attitudes toward maternal nutrition. Analysis from the study indicates a significant positive relationship between the level of education, occupation, nutrition knowledge and practices amongst pregnant women in the study area.

Study Limitation

The assessment of knowledge, attitude and practice of pregnant women regarding maternal nutrition in Abakaliki Metropolis can be graded above average, although one may argue that the research respondents may not be giving out their lived experience, they may just fill out socially acceptable answers. An ethnography study on the knowledge, Attitude and Practice (KAP) of pregnant women regarding maternal nutrition is needed so that research results will

have ground in reality. This is a quantitative research study and did not correlate KAP with maternal and fetal mortality. Convenient sampling was used in the present study; therefore, a large sample size is needed to collate more significant data on a comparative or causation study of KAP regarding maternal nutrition and mortality of mother, child or both during pregnancy/delivery.

Recommendations

Public health promotes education as the first step toward prevention. Hence the recommendations below:

1. Nutrition intervention such as nutrition education in different communities, health centres, health posts and women's organizations should be given particularly to pregnant mothers concerning nutrition during pregnancy to increase the nutritional attitude of mothers in the study area.
2. It is recommended that awareness of good, indigenous food cultures and dietary habits should be intensified to motivate practice and improve attitude.
3. Community leaders and members should invest in agriculture to enable increased access to fresh organic agricultural products such as fruits, vegetables, milk and dairy products.

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Authors' contributions

Both authors contributed to the generation of an idea, formulation of research design, data gathering, analysis, interpretation, revision and approval.

Conflict of Interest

The authors declare that there is no conflict of interest.

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