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**Assessment of Anthropometric Status and Dietary Pattern of Pregnant Women in Ilorin
South Local Government Area of Kwara State**

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Abstract

This study examines the anthropometric status and dietary pattern of pregnant women in Ilorin south local government area of Kwara state. The proportionate sampling technique was used to select one hundred respondents. A descriptive survey method was adopted using a four point Likert type questionnaire. Dietary data were obtained by means of a daily/weekly recall questionnaire (D/W/RQ). Each subject was required to report on all the foods consumed daily/weekly. Four objectives and four research questions guided the study with one hypothesis formulated. Data were statistically analyzed using percentages, mean score and standard deviation, while Pearson Product Moment Correlation Coefficient (PMCC) was used to test the formulated hypothesis at 0.05 level of significance. The result revealed that 47.92% pregnant women were mostly between 5 and 5.5ft tall, while, 46.88% weighed 61 to 70kg; 62.5% of them took fruits and vegetables regularly. The result further revealed that the respondents understood what nutrition and balance diet meant, were able to access balanced diet and monitored their nutritional status during pregnancy. It was also discovered that poverty has effect on ability to access adequate nutrition during pregnancy, which may be responsible for their irregular meals daily with 2.45 as the criterion mean. Result of PMCC revealed a significant ($p < 0.05$) positive correlation between nutritional knowledge and dietary pattern ($r = 0.326$, $p < 0.05$). Socioeconomic status also had significant correlation on the dietary pattern of respondents ($r = 0.842$, $p < 0.05$). While, anthropometric status was positively correlated to dietary pattern ($r = 0.326$; $p < 0.05$). The study therefore, concludes that nutrition knowledge is an input to and foundation for better dietary pattern and anthropometric status of pregnant women. It was recommended that government should implement mechanisms to help provide adequate nutrition for pregnant women..

Keywords: Nutrition knowledge, Anthropometric status, dietary pattern, socio-economic status

Introduction

In many developing countries, rapid population growth makes it difficult for food production to keep up with demand. These parts of the world are continually confronted with hunger and malnutrition (Oladimeji and

Karim, 2009). As at 1997, an estimated two billion people suffer from malnutrition and dietary deficiencies, more than eight hundred and forty (840) million people disproportionately women and girl children suffer chronic malnourishment. This

situation is compounded by the sky rocketing at unprecedented rates of food price. As at 2010, global food prices surged by 19% pushing more people to suffer from malnutrition (Karim and Karim, 2012).

This phenomenon appears to be having profound impact on women especially pregnant women going by the number of deaths of pregnant women and babies during pregnancy (Allen, 2005). Under special circumstances or conditions the body might require increase intake of food in order to be provided with the materials required under that special condition. An example of such a condition is the pregnancy period, during this period, the body experiences the need for increase food intake which would enable the pregnant women and the fetus stay healthy. It is being described as one of the most nutritionally demanding stages of the life cycle (Kaiser and Allen, 2002).

Nutritional status varies according to a number of factors which means that the nutritional status of a pregnant woman differs considerably from a non- pregnant state. The nutritional status of pregnant women is critical to the health of the woman and the baby not just during the pregnancy period but also after delivery as well as the first few years of the baby's existence.

The nutritional status of an individual can be ascertained or monitored through a variety of processes, dietary history, anthropometric measurements, biochemical measures and medical history (Gropper, 2005). All these comprise what is called nutritional assessment. These different approaches utilize differing parameters or indices, but they provide information on nutritional status. According to Prentice and Goldberg (2000) and King (2000), for an optimum nutritional status to be attained and maintained in the course of pregnancy, the woman requires an intake of food combinations in predetermined quantity and quality, often referred to as balanced diet.

Anthropometric status is determined by

measurement of the size, physical dimensions, and the gross composition of the body. It includes height, weight, skinfold thickness and circumference measurement of various parts of the body. This is used in monitoring normal growth and nutritional health in individuals as well as in detecting nutritional inadequacies (Bryd-Bredbenner, Beshgetoor, and Moe, 2007)

Dietary evaluation of nutritional status provides the description of dietary intake background which may help to explain the observed clinical or biochemical abnormalities. (Gropper, 2005) 24 hour recall of all food and beverages consumed and sometimes physical activities level engaged in during this period is the most common method of dietary assessment. Food frequency questionnaire which involves giving the subject food items to indicate their intake in terms of frequency and quantity per day/ week/month could also be used.

Nutrient intake during pregnancy requires dietary planning, a large number of empirical studies have established a direct link between nutrition and pregnancy (Steven, Allen, Pai, Best, Seaver, Dean, and Thompson, 2000). In addition there are also connections between physical disorders and poor nutrition before and during pregnancy as well as neurological disorders and handicaps which women encounter when malnourished.

The anthropometric status and dietary pattern of pregnant women is of great concern in the contemporary world, as it affects the nutritional and health status of both mother and the unborn child. Not paying attention to this area could give rise to serious health and nutritional problems of both mother and child. The high level of poverty in the North Central region of the country means a large number of the populations especially women and children may not be able to meet their nutritional requirements. Reports also indicate that the populace is mostly food and nutrition insecure, possibly

due to the escalated prices of food commodities and inaccessibility to regular income which leaves a lot of families and individuals mostly women and children under nutrition (Karim and Karim, 2012). Women are thus vulnerable to malnutrition for social and biological reasons.

Objectives of the study

This study sought to:

1. Assess the anthropometric status of pregnant women in Ilorin South LGA of Kwara state.
2. Evaluate the dietary pattern of pregnant women in Ilorin South LGA of Kwara state.
3. Determine nutritional knowledge of mothers during pregnancy.
4. Establish the relationship between dietary pattern and nutritional knowledge, socioeconomic and anthropometric status of pregnant women in Ilorin South LGA of Kwara state.

Research Questions

The following research questions were stated to guide this study.

1. What is the anthropometric status of pregnant women in Ilorin South LGA of Kwara state?
2. What is the daily weekly dietary pattern of pregnant women in Ilorin South LGA of Kwara state?
3. What are the levels of nutritional knowledge during pregnancy?
4. What is the relationship between dietary pattern and nutritional knowledge, socio-economic and anthropometric status of pregnant women in Ilorin South LGA of Kwara state?

Hypotheses

The following null hypothesis was formulated and tested at 0.05 level of significance.

There is no significant relationship between dietary pattern and nutritional knowledge, socio-economic status and anthropometric status of pregnant women in Ilorin South LGA of Kwara state.

Methodology

Research Design

The study employed survey design method. A well-structured questionnaire based on the research objectives was used to elicit responses from the respondents. Data collected were used to describe the situations of the variables to establish the relationship between dietary pattern and nutritional knowledge, socio-economic and anthropometric status of pregnant women in Ilorin South LGA of Kwara state.

Population

The study population was made up of pregnant women residing in the communities of Ilorin south local government area in Kwara State, Nigeria. A total of 1,230 pregnant were found to have registered with clinics for ante-natal treatment in 2012.

Sample and Sampling Technique:

Eight percent (i.e. one hundred pregnant women) of the population were randomly selected as the respondents

Instrumentation

Questionnaire tagged 'Anthropometric Status and Dietary Pattern Questionnaire (ASDPQ)' was used for data collection for this study. The questionnaire was developed based on the objectives, research questions and formulated hypotheses. The questionnaire was divided into two sections – A and B

Section A was on the socio-demographic characteristics and elicited information such as age, marital status, occupation, and income

Section B was on anthropometric

measurement, dietary pattern, nutritional knowledge and socio economic status of the respondents. The items were scored on a "4-point" Likert-scale ranging from "1" which indicates "strongly disagree" to "4" which indicates "strongly agree". The instrument also consist of a structured questionnaire that consists of closed ended questions developed in a way to elicit the relevant information required to test the hypothesis set for the study.

Daily / Weekly dietary recall: dietary data were obtained by means of a daily/weekly recall questionnaire (D/WRQ). Each participant was required to report on all the foods and fruits consumed daily/weekly.

Anthropometry: Anthropometric measurements for height and weight of the study women were taken following the standard procedures outlined by Lohman, Roche and Martoreth, (1988).

Validity of the Instrument: The instrument was validated by three experts in the Department of Home Economics and Food Science, University of Ilorin.

Reliability of the instrument: This was subjected to statistical analysis using Cronbach Alpha coefficient of reliability and the reliability coefficient of 0.85r was obtained.

Data collection: The instrument for data collection was self-administered by the researchers with the help of research assistants. Out of one hundred (100) questionnaires distributed ninety six copies were properly filled and used for the analysis.

Data Analysis: Responses to the items questionnaire were analyzed using frequency counts, percentages, mean and standard deviation. A mean value of 3.00 was taken as a cut off score for accepting an item (agree) while less than 3.00 is taken as disagree. The null hypothesis formulated was tested with Pearson Product Moment Correlation Coefficient (PMCC).

Results

The demographic results in Table 1 indicate that most of the respondents were within the ages of 21-30 years (83.3%) and 31-40 years (16.67%) and were all (100%) married.

Table 1: Demographic Distribution of the respondents (N=96)

S/N	Age (in years)	Frequency	Percentages
1	Below 20	-	-
2	21-30	80	83.3
3	31-40	16	16.67
Total		96	100
S/N	Marital Status	Frequency	Percentage
1.	Single	-	-
2.	Married	96	100
Total		96	100
S/N	Occupation	Frequency	Percentage
1.	Self-Employed	39	40.63
2.	Employed in public section	34	35.42
3.	Employed in private sector	14	14.58
4.	Unemployed	9	9.38
Total		96	100
S/N	Income	Frequency	Percentage
1.	Below ₦18,000	5	5.21
2.	₦19,000 - ₦ 37,000	16	16.67
3.	₦ 38,000 - ₦ 56,000	21	21.88
4.	₦ 57,000 - ₦ 75,000	5	5.21
5.	₦ 76,000 - ₦ 94,000	26	27.08
6.	₦ 95,000 and Above	21	21.88
7.	No Income	2	2.08
Total		96	100
S/N	Educational Qualification	Frequency	Percentage
1.	Primary	-	-
2.	Secondary	-	-
3.	Tertiary	96	100
4.	None	Nil	Nil
Total		96	100

The occupational distribution reveals that 40.63% of the women were self-employed. Out of which 35.42% were in public sector, 14.58% in private sector while few (9.3%) were unemployed. Furthermore, the income distribution, shows that a small fraction of the women (5.21%) earned below

the minimum salary (N18,000.00), while others earned above the minimum salary with 21.88% earning N95,000.00 and above.

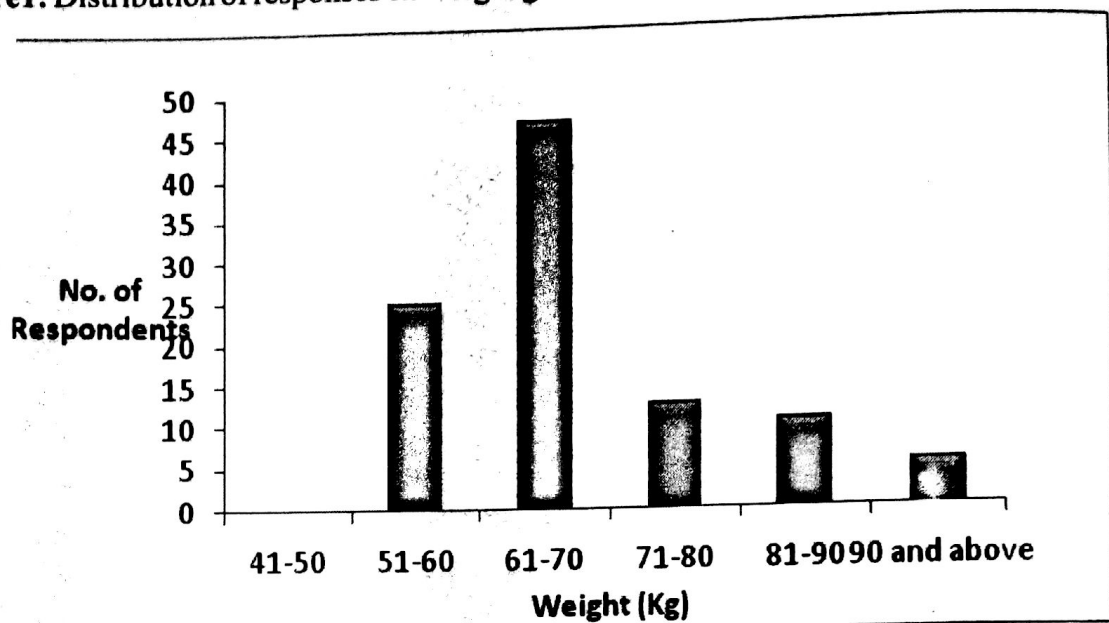
Research Question 1: What is the anthropometric status of pregnant women in Ilorin South LGA of Kwara state?

Table 2: Distribution of responses on height of pregnant women (N=96)

S/N	Options/Height	Frequency	Percentage
1	Less than 4ft	Nil	Nil
2	Between 4 and 4.5ft	15	15.63
3	Between 4.5 and 5ft	20	20.83
4	Between 5 and 5.5ft	46	47.92
5	Between 5.5 and 6ft	10	10.42
6	6ft and above	5	5.21
Total		96	100

Table 2 results shows that 47.92% pregnant women were mostly between 5 and 5.5ft tall, some were 4.5 and 5 ft(20.83%) while very few (5.21%) were 6ft and above.

Figure1: Distribution of responses on weight gain during pregnancy



Responses on weight gain during pregnancy indicated that 46.88% weighed 61 to 70kg, 25% weighed 51 to 60kg, 12.5% weighed 71 to 80kg; 10.42% weighed 81 to 90kg and 5.21% weighed 90kg as shown in (Fig. 1).

Research Question 2: What is the dietary pattern of pregnant women?

Table 3 reveals that 62.5% took fruits and vegetables, 18.75% consumed a lot of cereals, 9.38% took milk and milk products while only 9.30% eat meat and meat products. From Table 4 the number of food intake per day for the women in this study indicate that 73.96% had four meals a day, 15.63% had three meals per day and only 10.42% had two meals per day.

Table 3: Distribution of responses on group of food consumed during pregnancy (N=96)

S/N	Options	Frequency	Percentages
1	Cereals and tuber	18	18.75
2	Milk and milk products	9	9.38
3	Fats and oils	Nil	Nil
4	Fruits and vegetables	60	62.5
5	Meat and meat products	9	9.30
Total		96	100

Table 4: Daily Dietary recall for respondents of the study (N=96)

S/N	Options	Frequency	Percentages
1	1 meal	Nil	Nil
2	2 meals	10	10.42
3	3 meals	15	15.63
4	4 meals	71	73.96
5	5 meals	Nil	Nil
Total		96	100

Table 5: Weekly Dietary recall for respondents of the study (N=96)

S/N	List of foods	No of times taken weekly.					Total
		Nil	1-3	4-6	7-9	10-12	
1	Rice	8(8.33)	64(66.7)	12(12.5)	12(12.5)	Nil	96
2	Beans	8(8.33)	64(66.7)	12(12.5)	12(12.5)	Nil	96
3	Yam	10(10.4)	64(66.7)	16(16.7)	6(6.25)	Nil	96
4	Plantain	10(10.4)	60(62.5)	18(18.7)	8(8.33)	Nil	96
5	Potatoes	16(16.7)	56(58.3)	8(8.33)	8(8.33)	8(8.33)	96
6	Fish	16(16.7)	24(25)	36(37.5)	16(16.7)	4(4.2)	96
7	Meat	16(16.7)	32(33.3)	28(29.1)	16(16.7)	4(4.2)	96
8	Garri	32(33.3)	44(45.8)	8(8.33)	4(4.2)	8(8.33)	96
9	Yam flour	16(16.7)	56(58.3)	4(4.2)	16(16.7)	4(4.2)	96
10	Semovita	10(10.4)	48(50)	16(16.7)	8(8.33)	8(8.33)	96
11	Eggs	16(16.7)	12(12.5)	525(4.92)	08(8.33)	8(8.33)	96
12	Vegetables	16(16.7)	8(8.33)	40(41.66)	16(16.7)	16(16.7)	96
13	Fruits	16(16.7)	8(8.33)	44(45.8)	12(12.5)	16(16.7)	96
14	Pasta	Nil	56(58.3)	16(16.7)	16(16.7)	8(8.33)	96
15	Custard	12(12.5)	44(45.8)	14(14.6)	18(18.6)	8(8.33)	96
16	Pap	12(12.5)	64(66.7)	4(4.2)	8(8.33)	8(8.33)	96
17	Rice flour	44(45.8)	36(37.5)	4(4.2)	4(4.2)	8(8.33)	96
18	Pounded yam	Nil	70(72.9)	12(12.5)	10(10.4)	4(4.2)	96

Figures in parentheses are in percentages

Table 5 shows the dietary pattern of the pregnant women involved in the study. The analysis reveals that most of the respondents took adequate meals 1-3 times weekly while some others takes it 4-6 times, 7-9 and 10-12 times. Some do not take these adequate foods regularly.

Research Question 3: What are the levels of respondents' nutritional knowledge during pregnancy?

Table 6 reveals that the mean response of respondents on nutritional knowledge met the accepted criterion rate of 3.00 except their response on taking of regular meals per day during pregnancy.

Table 6: Mean Scores of Respondents on Nutritional knowledge during pregnancy (N=96)

S/N	Items	Mean (X)	SD	Remarks
1	Understand what balance diet is.	4.74	1.00121	Agree
2	Able to access balanced diet during pregnancy	4.74	1.00121	Agree
3	Know importance of nutrition during pregnancy	4.74	1.00121	Agree
4	Check weight regularly during pregnancy	4.74	1.00121	Agree
5	Aware of importance of mineral during pregnancy	4.65	1.01876	Agree
6	Take nutritional supplement during pregnancy	4.65	1.01876	Agree
7	Poverty has effect on ability to access adequate nutrition during pregnancy	4.65	1.01876	Agree
8	Check nutritional status during pregnancy	3.92	1.27667	Agree
9	Had regular meals per day during pregnancy	2.45	2.14323	Disagree

This also translate that the pregnant women understood what nutrition and adequate diet meant, were able to access adequate diet and check their nutritional status during pregnancy. It was also agreed

that poverty had effect on their ability to access adequate nutrition during pregnancy. The result also reveals that most of them do not agree to have regular meals daily as shown in the criterion mean rate of 2.45.

Table 7: Pearson Product Moment Correlation on dietary pattern, nutritional knowledge, socioeconomic and anthropometric status

	Pearson Correlation Coefficient (r)	Significant(2-tailed)	df	N	Remark
Nutritional Knowledge	.326	0.001			Sig.
Dietary pattern	.326	0.001			Sig.
Socio Economic Status	.842	0.000	94	96	Sig
Anthropometric Status	.326	0.001			Sig

Df-degree of freedom N - total sample size

A Pearson correlation was run to determine the relationship between the pregnant women's nutritional knowledge, anthropometric, socioeconomic status and dietary pattern. There was a significant ($p < 0.05$) positive correlation between nutritional knowledge and dietary pattern ($r = 0.326, p < 0.05$). There was also a very strong correlation between socioeconomic status and dietary pattern ($r = 0.842, p < 0.05$). Anthropometric status was positively correlated to dietary pattern ($r = 0.326, p < 0.05$). The hypotheses which states that there is no significant relationship between nutritional knowledge, anthropometric and socioeconomic status and dietary pattern is therefore rejected.

Discussion

The findings reveal that a significant number of the women were gainfully employed, while only few were unemployed (9.38%). This indicates that majority of the women in this area had access to regular income. World Health Organization explained that access to regular income is a prerequisite to accessing or maintenance of adequate nutrition (WHO, 2010). Their

income distribution also shows that an appreciated proportion of the women should be able to provide good nutrition for themselves during pregnancy. However, when looking at their income in the context of international standard which defines poverty for those earning income below two dollar per day as working poor (WHO, 2010). The women can therefore still be referred to as being within the range of the working poor and with the rising prices of food commodities, the ability to access adequate nutrition during pregnancy may be significantly hampered.

The educational qualification attained by the respondents indicates a commendable level of literacy. This explains that they may understand what constitute an adequate diet, and importance of taking variety and combination of food groups that make up adequate diet.

The findings of the anthropometric results show that the pregnant women were mostly between 5 and 5.5ft tall, while very few are 6ft and above. Nigeria women are described to be of average height (WHO, 2010). Though pregnancy does not have much influence on height for women of above

18 years old (Prentice and Goldberg, 2000). The increase in weights could be attributed to development of the foetus during pregnancy.

Reports also indicate that many pregnant women usually take nutritional supplements (Kaises and Allen, 2002, King, 2000). Though this act has not been totally condemned, but nutritionists believe that appropriate adequate diet may be sufficient during pregnancy (Hofmeyr, 2006).

Nonetheless, the women agreed that poverty had a huge impact on their nutritional status. This intricate connection between poverty and the nutritional status of pregnant women has been evident in numerous studies. With the criterion rate of 4.65 most agreed that poverty had effect on their ability to access adequate nutrition. This corroborates the opinion of Karim and Karim (2012) that poverty has direct linkage with the ability to access adequate nutrition and food security.

Kaiser and Allen (2002) earlier explained that pregnancy influenced nutrition and lifestyle of women. Majority of the women also indicated health, nutritional concern, knowledge and beliefs determine as factors determining their dietary intake while some admitted that food flavor, texture and appearance as the determinants of their nutrition.

The result of the Pearson Correlation on the relationship between the pregnant women's nutritional knowledge, anthropometric and socioeconomic status and dietary pattern indicates that knowledge of adequate nutrition tend to influence practice of good dietary pattern during pregnancy. There was also a very strong correlation between socioeconomic status and dietary pattern. The hypotheses which states that there is no significant relationship between nutrition knowledge, anthropometric and socioeconomic status and dietary pattern is therefore rejected. Anthropometric status was also positively correlated to dietary pattern ($r=0.326$; $p<0.05$).

Conclusion and Recommendations

The study thus concludes that nutritional knowledge is an input to and foundation for better dietary pattern and anthropometric status of pregnant women and is related to their socioeconomic status. There is the need in term of education, awareness, finances, empowerment or employment and needs to eat right for better health of the unborn child as well as that of the mother.

Based on the findings there is need for the state to review policies and implement mechanisms that will improve income generating activities of the women. Nutritional supplements should be made available to pregnant women at affordable prices in order to ensure accessibility. Concerted efforts should be made to stabilize the prices of staple food commodities that are locally produced that can assure food and nutrition security. An appropriate measure should be geared to halt the trend of poverty increase if pregnant women are to have access to adequate nutrition.

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