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EFFECT OF NUTRITIONAL INTAKE ON ANTHROPOMETRY STATUS OF RURAL PREGNANT WOMEN IN IFELODUN LOCAL GOVERNMENT AREA, KWARA STATE.

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ABSTRACT
Rural women contribute significantly to the national economy by their activities in terms of agriculture and food security, under normal and special condition such as pregnancy in which the body requires increase nutrient intake. Many rural women farmers have poor health status, which could be due to workload and poor nutrition. This study examined the effects of nutritional intake on the anthropometry status of rural pregnant women in Ifelodun local government area, Kwara State. Multistage sampling procedure was used to select 130 respondents. Primary data were collected using a well-structured questionnaire, and were analysed using descriptive and inferential statistics. Results showed that majority (68.5%) of the respondents were between age 20-29 years, Muslims (69.2%), with primary school education (43.8%), marketers (76.2%) with income between 4000-6000 naira and have at least two (2) children. Results also show that educational background ($\chi2 = 5.508; p = 0.044$), age ($r = 0.241; p = 0.006$), income ($r = 0.358; p = 0.030$), nutritional intake ($r = 0.550; p = 0.030$), had significant relationship on their anthropometry status. Also there was a significant weight gain during period of pregnancy ($t = 63.861; p = 0.000$). It recommends that pregnant women should be empowered economically to have a better source of income that will enable them afford better nutrition for proper development and growth of foetus.

Keywords: Nutritional intake, anthropometry status, effect, rural, pregnant women.

INTRODUCTION

Food is the basic necessity of life. Everybody eats food and most people enjoy it. According to Joshi (2010), from the beginning, scientists were curious about the food they consume, its passage in the body and its effects. This curiosity led to the development of science of nutrition. Olusanya, Bala, Eyisi and Olojola (2010); explained further that food is vital to good health and is any substance which after consumption, digestion and absorption to the body nourishes, supplies energy, promotes growth, repairs worn out tissues and regulates all body processes. However, 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 condition is the pregnancy period which the female body undertakes in line with human nature of reproduction. During this condition, the body experiences the need for increased nutritional materials which will enable the pregnant women and the fetus stay healthy throughout the duration of the trimester of the pregnancy. The importance of food is seen from the evidence of the role it plays in the human survival as pregnant condition is described as one of the most nutritionally demanding stages of the life cycle (Kaiser and Allen, 2002).

For a very long time, the nutritional status of pregnant women has attracted the attention of many national, local and international bodies or organizations (Barasi, 2003). In addition to the academia and other fields of discipline relating to food and health, the nutritional status of pregnant women is critical to the health of the woman particularly their anthropometry status and the baby which continues to develop within them; not just during pregnancy period but also after delivery as well the first few years of the baby's existence.

The anthropometric measurement is described as the measuring of size, physical dimension and the gross composition of the body, height and weight of the body. It is the simplest and most quantitative measure of the nutritional status. It is useful in monitoring normal growth and nutritional health in well-nourished individuals as well as in detecting nutritional inadequacies or excesses (Bredbenner, Beshgestor, Moe and Berning, 2009).

Maternal nutrition and health is considered as the most important regulator of human fetal growth. Improved maternal nutrition has been associated with increased fetal growth and a reduction in adverse birth outcomes in developing countries and in populations with nutrient deficiencies (Fall, Yajnik, and Rao, 2003; Rao, et al 2001). However, if women are not well nourished, they are more likely to give birth to weak babies resulting in high infant mortality rate (Subarnalata and Basumati, 2006). At birth, fetal weight is accepted as the single parameter that is directly related to the health and nutrition of the mother, and on the other hand, is an important determinant of the chances of the newborn to survive and experience healthy growth and development. This is because low birth weight has been shown to be directly related to both immediate, long-term and very long-term development and well-being.

Several studies have shown an association between anthropometric indicators and pregnancy outcome. Both insufficient and excessive gestational weight gain are strongly associated with maternal–fetal complications such as gestational diabetes, hypertensive pregnancy disorders (HPD), macrosomia, and low birth weight (Mohanty *et al*, 2006; Stotland *et al*. 2005).

Statement of problem

The bedrock of agriculture and non-agricultural development in developing countries of Africa is rural development UNDP (2005), without which all effort at agriculture development will be futile. The bulk of the poor, some three-quarter according to recent World Bank estimate lives in rural areas World Bank (2006), where they draw their livelihoods from agriculture and related activities. The population of Nigeria is growing rapidly, this has made food supply to be grossly inadequate to feed the growing population, and it has led to malnutrition, increased rate of morbidity and mortality among vulnerable groups. Many rural women farmers have poor health status, due to heavy farm work, childbearing and rearing and poor nutrition. One of the Millennium Development Goals is to improve maternal health and reduce child mortality and this can be achieved through adequate nutritional intake which is rather difficult for most women in the rural area because of low income. Thus, creating health risk for mothers and even leaving the children with health risk such as low birth weight which can prevent them in their adulthood from engaging in agricultural activities (that requires energy) as an enterprise or business venture hence reducing food production thus food insecurity.

Objectives of the study

The general objective of the study was to assess the effect of nutritional intake on anthropometry status of pregnant women in Ifelodun Local Government Area, Kwara State, Nigeria. Specifically, the study:
1.   described the socio-economic characteristics of the pregnant women in the study area;
2.   evaluated the nutritional intake of pregnant women in the study area; and
3.   assessed the anthropometric status of pregnant women in 2nd and 3rd trimesters.

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Hypotheses of the study

The following hypotheses were tested for this study:

Ho1-There is no relationship between the socio-economic characteristics and anthropometry status of the pregnant women in the study area.

Ho2-There is no significant relationship between the nutritional intake and the anthropometry status of the pregnant women in the study area.

Ho3-There is no significant difference between the anthropometry status of pregnant women in the 2nd and 3rd trimesters.

METHODOLOGY

The study was carried out in Ifelodun Local Government Area of Kwara State. The people of Ifelodun are Yoruba's and mostly of Igbomina origin with their roots in Ife, Oyo and Ketu, their headquarters in Share. It has an area of 3,435km2 and a population of 206,042 at the 2006 census. Majority of the people in the local government practices subsistence farming and marketing of agricultural produce to earn their living. The target population of the study comprised of all pregnant women who registered for ante-natal in the past five month at the basic health centre. A multistage sampling procedure was used to select the respondents. Firstly, purposive sampling was used to select the basic health care centres in the three randomly selected towns (Amoyo, Ganmo and Idofian) based on the level of patronage by the pregnant women in the locality. Secondly, purposive sampling was also used to select pregnant women in their second and third trimester. Proportionate sampling technique was used to select twenty percent (20%) out of 150 registered pregnant women in Amoyo, 200 in Ganmo and 300 in Idofian to give a sample size of one hundred and thirty (130) respondents. Primary data were obtained with the use of well- structured questionnaire and interview schedule. Variables measured include the socio-economic characteristics, nutritional intake and anthropometry. A list of food groups (9) was presented to respondents to select if consumed or not in 24 hours, the highest obtainable score was 9 and the lowest was 0. Respondents anthropometry (weight and height) was obtained and their body mass index (BMI) was calculated using formula in Wardlaw's perspective on nutrition where:

$$\text{Body mass index (BMI)} = \frac{\text{weight (kg)}}{\text{height}^2 \text{ (m}^2)}$$

Data were analysed using descriptive and inferential statistics.

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

Table I indicated that majority of the respondents were between age 20-29years while few (2 3%) were between the ages of 40-49, this implies that respondents are in their most reproductive stage of life cycle. 69.2% were Muslims while 30.8% were Christian, this is an indication that respondents are involved in religion that does not majorly support food taboos that could have effect on their nutritional intake. Close to half of respondents 43.8% have primary school education, 14.6% having no formal education, 35.4% having secondary and 6.2% having tertiary education. This implies that respondents have little access to education which may limit their capability to be vast in knowledge as regards what to eat during pregnancy period in order to avoid complications and harm to their babies. Majority of the respondents (76.2%) are involved in marketing, as an occupation and earns income between the range of 1000-6000naira (72.4%) monthly also, larger percentage (66.2%) have at least 1-3 children with 10% carrying their first pregnancy which implies that activities engaged in by respondent to earn a living fetches little income thereby limiting their purchasing power especially for those who already have children because they have other responsibilities to tend to and will make do of what is available to them for feeding which could affect their nutritional intake.

Nutritional intake of respondents
Frequency of consumption in 24 hours diet recall

Table II reveals that majority of the respondents consume cereals (92.3%) and meat (82.3%), which is high, however it was observed that only few consume vegetables (39.2%), fruits (30.0%) and milk products (29.2%). The implication is that nutritional intake of respondents in terms of minerals and vitamins is low. This contradicts (Anyakoha, 2015) who agreed that pregnant women should have increase intake in fruits and vegetables during pregnancy, as deficiency in this nutrients could affect the foetus development and lower their immunity against diseases and result in birthing of deformed babies. This is an indication that pregnant women in the study area requires knowledge on the need to consume foods rich in vitamins and minerals such as vegetables and fruits.

Table I: Distribution of respondents based on socio-economic characteristics N=130

Variables	F (%)	Mean	Standard deviation (SD)
Age (years)			
Less than 20	14 (10.8)		
20-29	89 (68.5)		
30-39	24 (18.5)	25.5 years	5.602
40-49	3 (2.3)		
Total	**130 (100)**		
Religion			
Christian	40 (30.8)		
Muslims	90 (69.2)		
Total	130 (100)		
Educational background			
No formal education	19 (14.6)		
Primary	57 (43.8)		
Secondary	46 (35.4)		
Tertiary	8 (6.2)		
Total	**130 (100)**		
Occupation			
No occupation	20 (15.4)		
Farming	2 (1.5)		
Marketing	99 (76.2)		
Teaching	5 (3.8)		
Public servant	4 (3.1)		
Total	**130 (100)**		
Income (naira)			
Less than 1000	21 (16.2)		
1000-3000	34 (26.2)		
4000-6000	60 (46.2)	₦5,042.31	₦7264.93
Above 7000	15 (11.4)		
Total	**130 (100)**		
Number of children			
No child	13 (10.0)		
1-3 86	(66.2) 2		
4-6 31	(23.8)		
Total	**130 (100)**		

Field survey, (2015).

Table II: Distribution of respondents based on 24 hours diet recall intake N=130

S/N	Food group	Frequency	Percentage (%)
1	**Cereals**		
	Millet, rice, maize, bread, and others	120	92.3
2	**Tubers**		
	Potatoes, yam, cassava, cocoyam and others	34	26.2
3	**Dark green leafy vegetables**		
	Ugu, green leaf, waterleaf, bitter leaf and okro	51	39.2
4	**Fruits**		
	Mango, orange, watermelon, banana, pawpaw, pineapple, guava and others	39	30.0
5	**Meat**		
	Beef, pork, chicken and other birds, liver, kidney, heart	108	83.1
6	Egg	16	12.3
7	**Seafood**		
	Fresh or dried fish, crayfish, shellfish	53	40.8
8	**Any food from;**		
	Beans, nuts, e.g beans cake, cowpea paste, moinmoin	53	40.8
9	**Any food from;**		
	Milk and other milk products	38	29.2

Field survey, (2015).

Anthropometry status of respondents

Table IIIa and b compares the anthropometry of pregnant women during the 2nd and 3rd trimester. The weight of pregnant women is dependent on adequate nutrients and it ensure avoidance of malformation during development. Table IIIa reveals that 41.5% of respondents weighed between 45-59kg at their first visit, at their second visit however only 33.1% weighted 45-59kg, at their third visit (21.5%) and at their fourth visit (12.3%); this shows a decrease in the percentage of respondents that weight between 45-59kg as they came for their visit. Meanwhile respondents who weighed between 60-74kg was on the increase as they came for their visits, first visit (46.9%), second visit (51.3%), third visit (60.0%) and fourth visit (66.9%). This was also confirmed in Table IIIb by their body mass index (BMI), which is the preferred weight for height standard because it is most closely related to fat content. The result reveals that there was an increase in the body mass index taken in the 2nd and 3rd trimester. The mean value of the body mass index of respondents in the 2nd trimester increased from 2.76 to 3.25 in the 3rd trimester. This implies that as the respondents' advances in their pregnancy period there was an increase in the body mass index, which could be as a result of increase in weight during these periods. This is in consonance with Joshi (2010) who reported that as pregnant women advances in their pregnancy period there should be additional weight gain due to the development of foetus

Table IIIa: Distribution of respondents by their weights during times of visit

Weight (kg)	2nd trimester				3rd trimester			
	1st Visit		2nd Visit		3rd Visit		4th Visit	
	F(%)	Mean	F(%)	Mean	F(%)	Mean	F(%)	Mean
45-59	54(41.5)		43(33.1)		28(21.5)		16(12.3)	
60-74	61(46.9)		67(51.3)		78(60.0)		87(66.9)	
75-89	10(7.7)	62.5	14(10.8)	64.9	18(13.8)	66.8	20(15.4)	69.1
90-104	2(1.5)		2(1.5)		2(1.5)		3(2.3)	
>104	3(2.3)		4(3.1)		4(3.1)		4(3.1)	

Field survey, (2015).

Table IIIb: Distribution of respondents by their body mass index during times of visit

BMI (kg/m2)	2nd trimester				3rd trimester			
	1st Visit		2nd Visit		3rd Visit		4th Visit	
	F(%)	Mean	F(%)	Mean	F(%)	Mean	F(%)	Mean
<20	1(0.8)		1(0.8)		0(0)		0(0)	
20-24.9	57(43.8)		43(33.1)		32(24.6)		17(13.1)	
25-29.9	54(41.5)		64(49.2)		70(53.8)		79(60.8)	
30-34.9	11(8.5)	2.76	13(10.0)	2.93	20(15.4)	3.06	23(17.7)	3.25
35-39,9	3(2.3)		4(3.1)		4(3.1)		6(4.6)	
>40	4(3.1)		5(3.8)		4(3.1)		5(3.8)	

Field survey, (2015).

Hypotheses testing.

Relationship between respondents' socio-economic characteristics. nutritional intake and anthropometry status.

Table IV reveals a significant relationship (r = 0.241; p = 0.006) between respondents' age and anthropometry status. This implies that age of the respondents determines their anthropometry status in that at different age group there are different nutritional requirement that could help in pregnancy. Also, educational background ($\chi 2$ = 5.508; p = 0.044) and income (r = 0.358; p = 0.030) has a significant relationship with anthropometry status. This implies that the income of the respondents affects their anthropometry if they do not have sufficient income, it will limit the purchasing power of respondents thereby not having enough income to make provisions for nutritious diet in their condition.

Also, the result shows that the type of diet taken by the respondents in 24- hours (daily) has effect on their anthropometry status. as there was a significant relationship between the nutritional intake and anthropometry status of respondents (r = 0.550; p = 0.03) which suggests that the diet taken by the respondent was made evident in their weights as they advance in their pregnancy period. This finding

corroborates Mridula et al (2003) who also reported that maternal diet is very essential has it allows the mother to lay down stores of nutrients required for fetal development and improve their health.

Table IV: Relationship between respondents' socio-economic characteristics, nutritional intake and anthropometry status.

Variables	r value	Pvalue	Inference
Age	0.241	0.006	S
Income	0.358	0.030	S
Nutritional intake	0.550	0.030	S
	$\chi 2$ value	Pvalue	Inference
Religion	0.889	0.346	NS
Educational background	5.508	0.044	S
Occupation	7.637	0.106	NS
Number of children	1.487	0.475	NS

Field survey, 2015.

Test of difference between respondents' anthropometry in second and third trimester
Table V shows there was a significant difference in the anthropometry of respondents (t = 63.86; p = 0.000) in their 2nd and 3rd trimester. Tables IIIa and IIIb further indicate the reason for difference in their second and third trimester because there was an increase in their weights which translated to their body mass index. This implies that as respondents' advances in their pregnancy period their body mass index tends to increase which signifies good health in respondents and cannot be dissociated from their nutritional intake. This was affirmed by Woods (2006) who reported that during pregnancy, women has a specific weight they are supposed to gain but it should be controlled to prevent excessive gestational weight.

Table V: Difference between respondents anthropometry in second and third trimester

Variables	t value	Df	Pvalue	Mean	Inference
Second trimester	63.861	129	0.000	26.590	S
Third trimester				28.393	

Field survey, 2015.

CONCLUSION AND RECOMMENDATIONS
Pregnant women intake in foods rich in carbohydrates and protein was high but their intake in foods rich in minerals and vitamins was rather low. There was a significant weight gain during pregnancy, this could be as a result of the high intake of food high in calories. The study concluded on the importance nutrition as deficiencies in nutritional intake can have adverse effect on the development of the foetus.

In light of the above conclusion drawn, the following were recommended;
1. Pregnant women should be empowered more economically in terms of education and finance (income) by designing strategies and policies that will enhance their enlightenment and purchasing power.
2. Women should be enlightened more on their consumption of fruits and vegetables, its importance and these foods should be affordability and accessibility especially for rural women.

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