

# Feeding Patterns as Correlates of Haemoglobin Status Among Pregnant Women Attending Antenatal Clinic in Primary Healthcare Facilities in Odeda Local Government

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## Abstract:

Maternal nutritional patterns play vital role in foetal growth and development, and it is a major public health concern in developing countries where food insecurity is predominant. This study aimed to examine the feeding patterns as correlates of haemoglobin status among pregnant women attending antenatal in primary health care facilities in Odeda local government. This study adopted a descriptive quantitative survey design. A sample of 422 pregnant women attending antenatal clinic in primary health care facilities in Odeda local government, were randomly selected to participate in the study. Two validated instruments were used for data collection; (PWFPQ,  $\alpha=0.766$ ) and Quality of Food Intake, ( $\alpha=0.836$ ) while haemoglobin status was obtained from medical record. Data were analysed using descriptive statistics and Pearson Product Moment Correlation at 0.05 level of significance. The findings from study revealed prevalence of feeding patterns: (55.9%) of the pregnant women eat 3 times daily, 26.1% eat at

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least 2 times daily and 46(10.9%) eat more than 3 times daily. Also, (48.1%) of the pregnant women eat breakfast, lunch and supper, 19.2% eat breakfast and lunch and 18.5% eat breakfast alone while 14.2% had lunch and supper. Finding also revealed that majority of the pregnant women had normal haemoglobin status; very few had low haemoglobin status of below 11g/dl. Finding also shows that feeding patterns of pregnant women during pregnancy has significant relationship with pregnant women haemoglobin status ( $r=336$ ,  $P=0.000$ ). It was therefore recommended, among others, that nutrition education programmes and mother crafts should be organized for pregnant mothers and adolescent girls, so as to improve their nutrition knowledge.

**Keywords:** Feeding Pattern, Haemoglobin Status, Pregnant Women,



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## Introduction

Pregnancy is a highly sensitive period in a woman's life and so a pregnant woman should avoid any risk factor that can have negative effect on their health and the baby's growth and development. In developing countries, the World Health Organization (WHO) reveals that about 56% of pregnant women is anaemic (having low haemoglobin level). Poor feeding patterns among these pregnant women was noticed to influence their haemoglobin level negatively (low haemoglobin). Often times these feeding patterns has a role to play in the high rate of preterm deliveries and small for gestational age birth common among these mothers from the study area. Also ignorance as per the feeding necessities during pregnancy was observed among the pregnant women.

Nutritional intake of pregnant women remains in the interest of researchers in many parts of the world both developed and developing nations (Shole, 2019). This could be attributed to the fact that pregnancy stages need adjustments in nutritional demands, metabolism, maternal body composition, function of various physiological systems placed on the woman by her developing baby. Appropriate nutrition and feeding patterns for the pregnant women is important to ensure adequate growth, development and good health of foetus (World Health Organization, 2020). A nutritional food that meets maternal health needs is required, so that maternal well-being is ensured with the delivery of an healthy infant (Ademuyiwa & Sanni, 2018).

The feeding pattern of pregnant women daily affects how their bodies work and how they maintain energy and strength. It also shows the basic nutritional health that their babies are born with, and also indicates a model for their eating patterns during childhood and beyond. Meanwhile, Kuche (2016) observed that when a woman is pregnant, her body's demand for energy, protein, vitamins and minerals increases by 13%, 54% and 50% respectively. This emphasizes that the period of pregnancy is a critical time to meet these demands for both micro and macronutrients. Thus, this in turn places high needs for healthy nutritional lifestyle options as the growing foetus draws a lot of energy and nutrients from the mother in-utero for physical and psychological development (Kever, et al, 2015).

Feeding patterns of pregnant women is designed by food ways such as cultural customs and social system, food availability and accessibility which is influenced by their experiences, attitudes and beliefs (Kever, et al, 2015). Traditional food taboos and beliefs are food ways which are deeply engraved into ways of life and influence daily eating patterns of pregnant women, so also food beliefs and taboos, which determine what is or is not permitted be eaten, may escalate malnutrition by limiting nutritious food that pregnant women eat during period of pregnancy. According to Hoffmann et al., (2018) healthy feeding patterns during pregnancy helps to prevent pregnancy complications, aids recovery from childbirth, effectively sustains breastfeeding and also protects the baby for having diseases in adulthood. However, when adequate feeding patterns is not maintained during pregnancy, malnutrition ensues.

Low haemoglobin in pregnancy is defined by the World Health Organisation (WHO) as haemoglobin concentration (Hb) below 11g/dl (Idowu, et al., 2015) classified Low haemoglobin in pregnancy as mild, moderate or severe. Meanwhile, WHO pegs the Hb levels for each of these classes of anaemia in pregnancy at 10.0-10.9g/dl (mild anaemia), 7.0-9.9g/dl



(moderate anaemia) and less than 7.0g/dl (severe anaemia). Anaemia is an essential public health problem worldwide with the women and children being the most vulnerable. The World Health Organisation predicts that more than half of the pregnant women in the world have haemoglobin concentration indicative of anaemia (Idowu, Mafiana & Sotiloye, 2015).

Previous studies on pregnant women focused mainly on consumption pattern, eating habit and knowledge of teenage pregnancy (Sousal, et al., 2018) and prevalence as correlates of maternal anemia (Samson, et al., 2018). However, most of these studies did not consider the feeding pattern relationship with pregnant women haemoglobin status. Gaining holistic understanding of feeding pattern and how these may affect the haemoglobin status of pregnant woman and foetus is essential for health practitioner and nutritionist. This was what informed the researcher to carry out this study in order to examine the feeding patterns as correlates of haemoglobin status among pregnant women attending antenatal clinic in primary healthcare facilities in Odeda local government.

Thus, the main objective of the study was to examine feeding pattern as correlates of haemoglobin status among pregnant women attending antenatal clinic in primary health care facilities in Odeda local government. This study specifically examined:

1. feeding patterns are prevalent among pregnant women attending ANC in PHC facilities in Odeda Local government;
2. the haemoglobin status of pregnant women based on gestational age in Odeda local government;
3. the relationship between feeding pattern and haemoglobin status of the pregnant women;
4. the relationship between number of meals per day and pregnant women haemoglobin status; and
5. the relationship between quality of food intake and pregnant women haemoglobin status.

### Research Questions

The following research questions were raised for this study:

1. What feeding patterns are prevalent among pregnant women attending ANC in PHC facilities in Odeda Local government?
2. What is the haemoglobin status of pregnant women based on gestational age in Odeda local government?

### Research Hypotheses

The following research hypotheses were postulated for this study:

1. There is no significant relationship between feeding pattern and haemoglobin status of the pregnant women.
2. There is no significant relationship between number of meals per day and pregnant women haemoglobin status.
3. There is no significant relationship between quality of food intake and pregnant women haemoglobin status.

### Methodology

This study adopted a descriptive quantitative survey design. The study was conducted in Primary Health Care Facilities (PHCF) in Odeda Local Government Area located at



Abeokuta metropolis of Ogun State. The study population included all pregnant women attending antenatal care clinic in Primary Healthcare Facilities in Odeda Local Government Area. Multistage sampling procedure was used in selecting the target samples of 422 pregnant women. A self-reporting instrument tagged "Pregnant Women Feeding Pattern Questionnaire" (PWFPQ) was adapted from the National Food Consumption and Nutrition Survey. Clinical records was used to obtain the hemoglobin status of the respondents as obtaining blood sample from women would be more invasive, time consuming and costly.

The validity of the instrument was ascertained by experts in the field of Nursing Science and Tests and Measurement. The reliability of the instruments was ascertained in order to check the internal consistency of the instrument. The reliability of the instrument was determined using Cronbach Alpha statistics. The reliability coefficient of feeding pattern yielded 0.766, while quality of food intake further yielded 0.836. This shows that the instrument is highly reliable and appropriate for the study. The instrument (Pregnant Women Feeding Pattern Questionnaire (PWFPQ) was administered to the respondents. Hemoglobin status was determined using their clinical records and those with the hemoglobin level below 11 g/dl were recorded as (anemic) and those with hemoglobin level > 11 g/dl were recorded as non-anemic. Data from completed questionnaires was coded then entered, cleaned and analyzed using statistical package for social sciences (SPSS) version 27.0. The data was analysed using descriptive and inferential statistics.

## Results

**Research Question 1:** What feeding patterns are prevalent among pregnant women attending ANC in PHC facilities in Odeda Local government?

**Table 1: Prevalent of Feeding Pattern among Pregnant women**

Items	Categories	Frequency	Percentage
How often do you eat a day?	Once	30	7.1%
	At least 2x daily	110	26.1%
	3x daily	236	55.9%
	More than 3x	46	10.9%
Which of these meals do you normally eat?	Breakfast alone	78	18.5%
	Breakfast & Lunch	81	19.2%
	Breakfast, Lunch & Supper	203	48.1%
	Lunch & Supper	60	14.2%
Do you eat in between meals?	Never	65	15.4%
	Sometimes	285	67.5%
	Always	67	15.9%
	No response	5	1.2%
What do you eat as in between meals	Fruits	275	65.2%
	Vegetables	121	28.7%
	Confectionaries	17	4.0%
	Others	9	2.1%
How often do you eat fruits	Frequently	238	56.4%



	Occasionally	92	21.8%
	Rarely	92	21.8%
How hungry do you feel at first trimester	Less hungry	325	77.0%
	More hungry	80	19.0%
	Very hungry	11	2.6%
	Same as before	6	1.4%
Number of snacks in a day	One	232	55.0%
	Two	134	31.8%
	More than two times	56	13.3%
Household measure of evaluation of amount of serving	Enough	292	69.2%
	Not enough	130	30.8%
How often do you normally skip meals	Often	141	33.4%
	Occasionally	238	56.4%
	Rarely	41	9.7%
	Never	2	0.5%
Type of meal skipped	Breakfast	66	15.6%
	Lunch	213	50.5%
	Dinner	143	33.9%
Reasons for skipping meals	Not hungry	116	27.5%
	No Food	230	54.5%
	No Appetite	62	14.7%
	Others	14	3.3%

**Source:** Field Survey, 2021

Table 1 revealed the prevalent of feeding pattern among the pregnant women in the study area. It was observed from the study that majority (55.9%) of the pregnant women often had 3 times daily, 110(26.1%) often do eat at least 2 times daily and 46(10.9%) often eat more than 3 times daily. On the other hand 7.1% of them often eat once daily. Also, majority (48.1%) of the respondents normally eat breakfast, lunch and supper, 81(19.2%) normally eat breakfast and lunch and 18.5% normally eat breakfast alone while 14.2% had lunch and supper. In addition, it was observed from the table that 67.5% of the respondents sometimes eat in between meal, 15.9% always and 15.4% never eat in between meals. On type of food eat between meal, 65.2% eat fruits, 28.7% eat vegetables and 4.0% eat confectionaries while 2.1% other. This reveals that majority of pregnant women eat fruit and vegetables in between meals. Two hundred and thirty-eight (56.4%) of the pregnant women frequently eat fruits, 21.8% occasionally and rarely eat fruits.

Furthermore, 77.0% of the pregnant women feel less hungry first trimester, 19.0% feel more hungry at first trimester and 2.6% feel very hungry while 1.4% indicated same as before. 71.6% change the amount of your food intake during your last pregnancy while 28.4% indicated that they do not change the amount of your food intake during your last pregnancy. More so, 55.0% of the pregnant women indicated that they eat one snacks in a day and 31.8% eat two snacks per day while 13.3% eat more than two snacks in a day. On household serving,



69.2% reveals that they have enough on the measure of household serving while 30.8% shows that the household serving is not enough.

More importantly, it was observed from the result that majority (56.4%) of the pregnant women do occasionally skip meal, 33.4% often while 9.7% rarely skip meals. Also, 50.5% of the pregnant women normally skipped lunch, 33.9% skipped dinner while 15.6% skipped breakfast. 54.5% skipped meals because there is no food to eat, 27.5% skipped meals because they were not hungry while 14.7% they do not have appetite that is the reasons why they skipped meals. The general overview from the result revealed that the frequency of food consumes, snack consumption per day also increased during pregnancy. Different types of snacks were consumed during pregnancy. Meals consumed in between meals included, fruits, vegetables and confectionaries and others. Also, on the main reason why majority of the pregnant women skipped food because they are nor hungry and some because they do not have food to eat.

**Table 2: Feeding pattern according to Gestational Age of the Pregnancy**

Pattern of eating	First trimester	Second trimester	Third trimester
Eat more	229(54.3%)	152(36.0%)	41(9.7%)
Eat less	177(41.9%)	212(50.2%)	33(7.8%)
No difference in my eating habit	97(23.0%)	141(33.4%)	184(43.6%)

**Source:** Field Survey, 2021

Table 2 revealed the patterns of eating according to gestation period of the pregnancy. In the first trimester, there were differences in the mode of feeding. A higher number of pregnant women (54.3%) eat more, 41.9% eat less and 23.4% has no difference in their eating pattern during their first trimester. A total of 36% reported they ate more, 50.2% ate less, 33.4% reported that there was no difference in their mode of feeding in second trimester. In the third trimester, 9.7% of respondents ate more than normal, 7.8% eat less while 43.6% of respondents has no different in their eating habit during the third trimester.





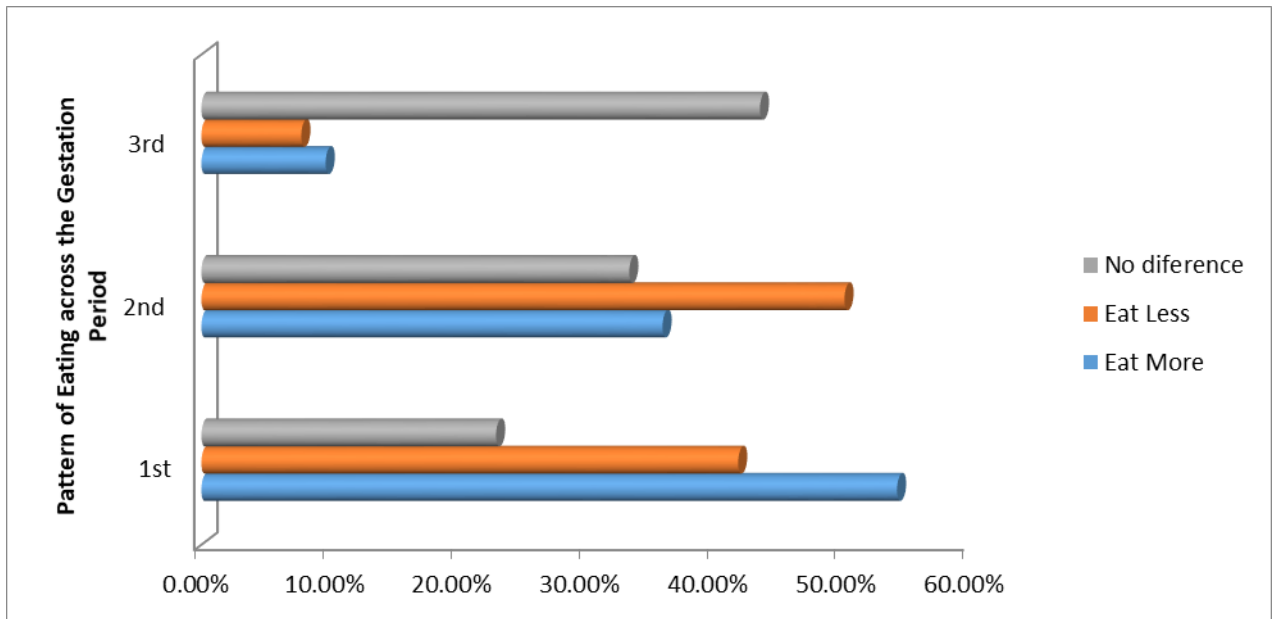


Figure i: Pattern of Eating Across Gestation Period

**Research Question 2:** What is the haemoglobin status of pregnant women based on gestational age in Odeda local government?

**Table 3: Haemoglobin status of the Pregnant Women and Gestational Age**

Haemoglobin (Hb)Level	First trimester	Second trimester	Third trimester
Normal>11	70(28.1%)	144(57.8%)	35(14.1%)
Low Haemoglobin < 11.0g/dl	48(28.9%)	83(50.0%)	35(21.1%)

**Source:** Field Survey, 2021

Table 3 shows distribution of study women by haemoglobin levels and gestational age. 28.1% of women in their first trimester had haemoglobin level > 11g/dl while 28.9% had haemoglobin level < 11g/dl. 57.8% in the second trimester had >11.0g/dl Hb levels, while 14.1% in the third trimester had > 11.0g/dl Hb levels. 50% and 21.1% in the second and third trimesters respectively had < 11.0g/dl Hb levels.

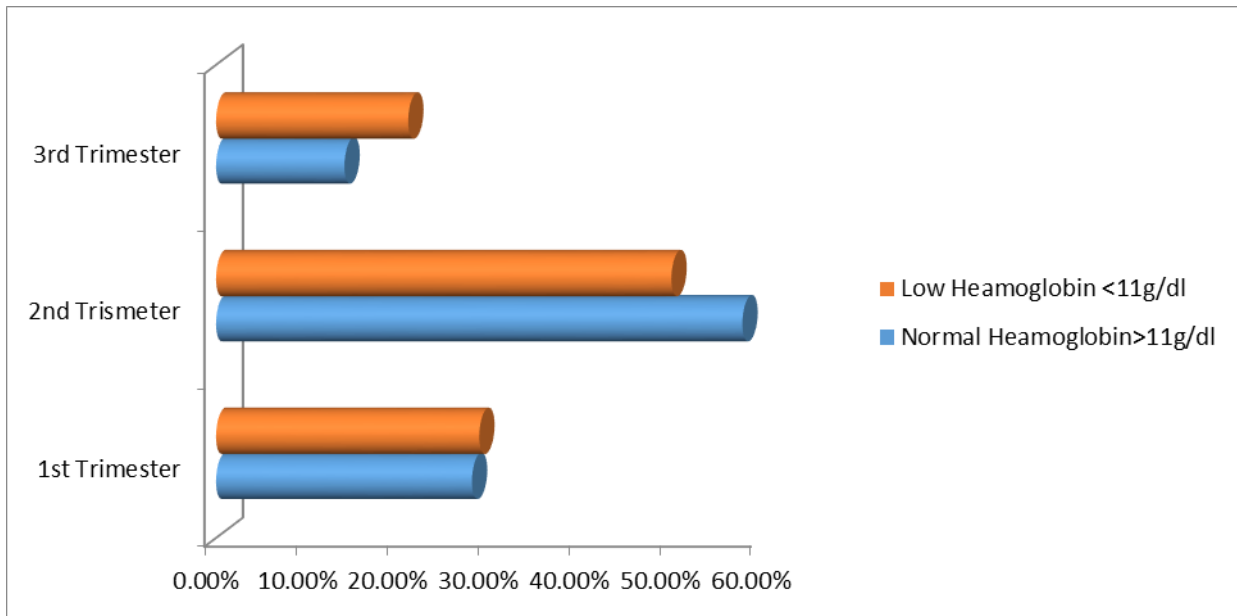


Figure ii: Gestational Age via hemoglobin Level

**Test of Hypotheses**

**Hypothesis 1:** There is no significant relationship between feeding pattern and haemoglobin status of the pregnant women

**Table 4: Relationship between the feeding pattern and haemoglobin status of the pregnant women**

		Haemoglobin level	Feeding Pattern
Haemoglobin level	Pearson Correlation	1	.336**
	Sig. (2-tailed)		.000
	N	422	422
Feeding Pattern	Pearson Correlation	.336**	1
	Sig. (2-tailed)	.000	
	N	422	422

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Source:** Field Survey, 2021

Table 4 shows the bivariate analysis of relationship between the feeding pattern and haemoglobin status of the pregnant women. The result revealed that there was significant association at (P<0.05) observed between s the feeding pattern and haemoglobin status of the pregnant women. There is positive relationship exit between the variables (r = 0.336) and the magnitude of relationship observed was also significant. A general overview shows that feeding pattern of the pregnant women has the strong relationship with haemoglobin status. Therefore, the hypothesis which states that there is no significant relationship between the feeding pattern and haemoglobin status of the pregnant women was rejected.



**Hypothesis 2:** There is no significant relationship between number of meals per day and pregnant women haemoglobin status

**Table 5: Relationship Between Number of Meal per day and Pregnant Women Haemoglobin Level**

		Haemoglobin level	Number of Meal per day
Haemoglobin level	Pearson Correlation	1	.256*
	Sig. (2-tailed)		.002
	N	422	422
Number of meals per day	Pearson Correlation	.256*	1
	Sig. (2-tailed)	.002	
	N	422	422

\*. Correlation is significant at the 0.05 level (2-tailed).

**Source:** Field Survey, 2021

Table 5 further shows the bivariate analysis of relationship between number of meal per day and pregnant women haemoglobin level. The result from the table shows that the relationship was significant at ( $P < 0.05$ ), a positive relationship was observed between number of meal per day and pregnant women haemoglobin level. Hence, the hypothesis was therefore rejected. This implies that there is significant relationship between number of meal per day and pregnant women haemoglobin level.

**Hypothesis 3:** There is no significant relationship between quality of food intake and pregnant women haemoglobin status

**Table 6: Relationship between Quality of Food Intake and Pregnant Women Haemoglobin Level**

		Haemoglobin level	Quality Food
Haemoglobin level	Pearson Correlation	1	.160**
	Sig. (2-tailed)		.001
	N	422	422
Quality Food	Pearson Correlation	.160**	1
	Sig. (2-tailed)	.001	
	N	422	422

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Source:** Field Survey, 2021

Table 6 shows the bivariate analysis of relationship between quality of food intake and pregnant women haemoglobin level. The result revealed that there was significant relationship at ( $P < 0.05$ ) observed between the quality of food intake and haemoglobin status of the pregnant women. There is positive relationship exist between the variables ( $r = 0.160$ ) and the magnitude of relationship observed was also significant. A general overview shows that quality of food intake of the pregnant women has the strong relationship with haemoglobin status. Therefore, the hypothesis which states that there is no relationship between quality of food intake and pregnant women haemoglobin level was rejected.



## Discussion

The findings of the study revealed the prevalent of feeding pattern among the pregnant women in the study area. It was observed from the study that majority (55.9%) of the pregnant women often had 3 times daily, 110(26.1%) often do eat at least 2 times daily and 46(10.9%) often eat more than 3 times daily. Also, majority (48.1%) of the respondents normally eat breakfast, lunch and supper, 81(19.2%) normally eat breakfast and lunch and 18.5% normally eat breakfast alone while 14.2% had lunch and supper. In addition, it was observed from the result that 67.5% of the respondents sometimes eat in between meal, 15.9% always and 15.4% never eat in between meals. On type of food eat between meal, 65.2% eat fruits, 28.7% eat vegetables and 4.0% eat confectionaries while 2.1% other. This reveals that majority of pregnant women eat fruit and vegetables in between meals. Two hundred and thirty-eight (56.4%) of the pregnant women frequently eat fruits, 21.8% occasionally and rarely eat fruits. This shows that majority of the pregnant women have good pattern of dietary.

Furthermore, 77.0% of the pregnant women feel less hungry first trimester, 19.0% feel more hungry at first trimester and 2.6% feel very hungry while 1.4% indicated same as before. 71.6% change the amount of your food intake during your last pregnancy while 28.4% indicated that they do not change the amount of your food intake during your last pregnancy. These findings are in line with the findings of Musa et al (2013) which reveal that pregnant women ate less in their last trimester of pregnancy so as to reduce the weight of the foetus; and that the appetite of pregnant women decreased as pregnancy advanced. More so, 55.0% of the pregnant women indicated that they eat one snacks in a day and 31.8% eat two snacks per day while 13.3% eat more than two snacks in a day. This observation is in line with that of Robin (2010) who stated that pregnant women crave for food and non-food items like clay, pickles, ice cream and chocolate as a result of the body's need for calcium at this point in time during a woman's life. The finding from the study revealed that, 69.2% of the pregnant have enough on the measure of household serving while 30.8% shows that the household serving is not enough.

This finding is in line with Huybregts *et al.* (2009) in Burkina Faso where mean energy and nutrient intakes were found to be insufficient compared with the recommended daily allowances, especially for pregnant women. This finding support Vause *et al.* (2016) who observed that many health care practitioners and their patients are aware of the general importance of proper nutrition during pregnancy, but may not be aware of specific recommendations and how to achieve them. This study was in line with Oktriyani *et al.* (2014), who stated that dietary pattern affected the adequacy of energy intake; the amount of food consumed by the mothers would affect the maternal haemoglobin status.

Finding from the study also shows that in the first trimester, there were differences in the mode of feeding. A higher number of pregnant women (54.3%) eat more, 41.9% eat less and 23.4% has no difference in their eating pattern during their first trimester. A total of 36% reported they ate more, 50.2% ate less, 33.4% reported that there was no difference in their mode of feeding in second trimester. In the third trimester, 9.7% of respondents ate more than normal, 7.8% eat less while 43.6% of respondents has no different in their eating habit during the third trimester. This was in line with a study by Darnton-hill and Mkpuru



(2015) which stated that the lack of nutrition during pregnancy should be considered because it closely related to the incidence of low haemoglobin status among pregnant women (Bekele et al., 2016).

The finding revealed that there was significant association at ( $P < 0.05$ ) observed between the feeding pattern and haemoglobin status of the pregnant women and the magnitude of relationship observed was also significant. A general overview shows that feeding pattern of the pregnant women has the strong relationship with haemoglobin status. This study was in line with Oktriyani et al. (2014), who stated that dietary pattern affected the adequacy of energy intake, the amount of food consumed by the mothers would affect the maternal nutritional intake. Maternal dietary pattern was different in every trimester. In the first and second trimester, pregnant mothers tend to experience chronic energy deficiency due to unstable conditions. It showed that pregnant women who have good pattern feeding can reduce the risk of low haemoglobin and anemia. This was in line with a study by Darnton-hill and Mkparu (2015) which stated that the lack of nutrition during pregnancy should be considered because it closely related to the incidence of low haemoglobin among pregnant women (Bekele et al., 2016). Based on the guidelines of balanced nutrition, nutritional needs of pregnant women were enhanced, namely macro and micro nutrients (Ministry of Health, 2014).

The result revealed that there was significant relationship at ( $P < 0.05$ ) observed between the quality of food intake and haemoglobin status of the pregnant women and that the magnitude of relationship observed was also significant. A general overview shows that quality of food intake of the pregnant women has the strong relationship with haemoglobin status. It showed that pregnant women who have good nutrition intake can reduce the risk of anemia. This was in line with a study by Darnton-hill and Mkparu (2015) which stated that the lack of nutrition during pregnancy should be considered because it closely related to the incidence of anemia (Bekele et al., 2016). Fulfilling balanced nutrition during pregnancy was useful to overcome the nutritional problems such as nutritional deficiencies. Based on the guidelines of balanced nutrition, nutritional needs of pregnant women were enhanced, namely macro and micro nutrients.

## Conclusion

The foregoing discussion has indicated that feeding patterns of pregnant women during pregnancy has significant relationship with pregnant women haemoglobin status. From the study, it is evidence that feeding patterns has an effect on the haemoglobin levels of pregnant women. The finding from the study revealed that the quality of food intake is effective in predicting pregnant women haemoglobin level. This could be so because adequate and appropriate nutritional practices during period of pregnancy will definitely improve the health status of the pregnant women thereby maintaining normal haemoglobin level. It is also concluded that majority of the pregnant women had normal haemoglobin status; very few had poor haemoglobin status of below 11g/dl.



## Recommendations

Based on the result of the findings, the following recommendations were made;

1. Nutrition education programmes should be organized for pregnant mothers and adolescent girls, so as to improve their nutrition knowledge. Since pregnancy is the most nutritionally demanding period in a woman's life, pregnant women should be encouraged and educated to eat more diversified extra meal and iron-rich foods during pregnancy than usual to reduce the incidence of low hemoglobin during pregnancy.
2. Health care providers should introduce strategies for providing health education about proper and balanced maternal nutrition during ANC visits
3. Dietary approaches, including fortification of foods with micronutrients, which may prove to be more beneficial and sustainable than provision of supplements during pregnancy. Such approaches would encompass increasing energy and macronutrient intakes, as well as micronutrient intakes, which may be more advantageous

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