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The Nutritional Status and Dietary Habits among Pregnant Women Seeking Antenatal services in Othaya Constituency, Nyeri, County in Kenya

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Abstract

Purpose: The purpose of the paper is to seek to understand the contributions of dietary habits on the nutritional status of pregnant women seeking ANC services in the Constituency. It is guided by two objectives, to assess the nutritional status of pregnant women in Othaya Constituency making their first ANC visit during their current pregnancy and to establish the dietary habits of pregnant women in Othaya Constituency. The paper is grounded on the Social Learning Theory (SLT).

Methodology: The study used a descriptive, cross-sectional survey design which employed a mixed-method approach. An interviewer-administered questionnaire was used to collect data from 119 pregnant women while qualitative data were collected through focus group discussions and Key Informants. Secondary data were collected from the hospital records and maternal and child health booklet. Hb levels, MUAC, and Women Dietary Diversity Score were used to assess the nutritional status of the women.

Findings: The findings established that 14% of the study participants had Hb levels below 11 g/dl and were therefore anaemic. MUAC measurements established that 9% of the women were undernourished (MUAC below 23 cm) while 91% had adequate nutritional status (MUAC ≥ 23). The mean dietary diversity score for the 9 food groups was 4.68±1.32 while the lowest and highest were 1 and 7 food groups respectively. The respondents' dietary habits revealed that they mainly consumed starchy foods..

Unique Contribution to Theory, Policy and Practice: The findings also revealed that the women were eating the foods they did because they had learnt it from their growing up at the family level and also through interacting with others later in life. This therefore shows that the choice people make on the food they eat is a learned behaviour and thus the contribution to the SLT. By revealing the gap in the dietary habits of pregnant women, the need for more emphasis in policy implementation regarding the dietary habits of pregnant women or where need be the need for policy review to ensure a more robust promotion of a more diversified diet among pregnant women. The paper therefore recommends the need to intensify nutrition education and counselling at the community level and Diversification of food crops.

Keywords: *Nutritional Status, Dietary Habits, Pregnant women, ANC Services, Othaya*

Introduction

An estimated 821 million people are undernourished in the world today. This is a rise from 804 million reported in 2016 and translates to one out of nine people in the world being undernourished. A total of 1.9 billion adults in the world are overweight or obese while 462 million are underweight. Further, according to estimates, 10.2% of the world population is food insecure, an increase from the 8.9% global estimate from the year 2016 (FAO, IFAD, UNICEF, WFP and WHO, 2018). Notably, food insecurity has a gender perspective with recent data showing a higher prevalence of severe food insecurity among women. Estimates show that in Africa, more women (24.3%) are food insecure compared to men at 23.9% (FAO, 2018).

According to WHO (2018), it is estimated that globally, one out of every three people suffers from at least one form of malnutrition. Women of reproductive age, who are food insecure have been found to be at risk of suffering from anaemia and one in three women of reproductive age, evidence shows, are anaemic (FAO, IFAD, UNICEF, WFP and WHO, 2018). Pregnant women are particularly, have an elevated risk of getting malnourished which is a result of an increase in demand for extra nutrients to feed the growing foetus. Recent data estimate the global prevalence of anaemia in pregnant women at 38.2% (WHO, 2015).

Globally, maternal under-nutrition contributes to 800, 000 annual neonatal deaths. Low birth weight, which is a strong indicator deficient in maternal nutrition not only but before also during pregnancy, accounts for 15% - 20% of all births (Bhutta et al., 2013). In Sub-Saharan Africa, the prevalence of LBW is estimated at 13% -15% which is considered an underestimation because many births occur at home where birth weight may not be documented (UNICEF 2004). LBW according to this UN agency is linked closely with foetal and neonatal mortality and LBW infants are 20 times more likely to die than heavier babies.

Global efforts to address the issue of nutrition insecurity include the UNICEF nutrition strategies (1990 & 2015) ICN (FAO; WHO, 1992, 2014), and the adoption of the Rome Declaration on Nutrition and the Framework for Action and declaration (2016-2025) as the United Nations Decade on Nutrition (FAO, WHO, 2014). In Kenya, anaemia is documented as the leading indirect cause of high maternal and neonatal deaths even as women remain adversely affected by other micronutrient deficiencies (Government of Kenya, 2011). Further, the WHO (2010), estimates 10 million people are food insecure, with severe micronutrient deficiencies predominantly occurring among pregnant women, lactating women, and children aged below five years (WHO, 2010).

Statement of the problem

Notwithstanding efforts made by the government of Kenya, local and international agencies to address the nutrition situation, many pregnant women still lack a diet that is adequate to meet both the maternal and foetal nutritional requirements. There are many pregnant women whose consumption of meat, vegetables, fruits, and dairy products remains inadequate. The available literature shows that this is mainly experienced in low and medium-income countries where several nutritional deficiencies are common (WHO, 2016). Studies show that 38.2%, globally

and 39% in Africa, the burden of anaemia among pregnant women remains high. Iron deficiency anaemia whose major cause is low consumption of meat, fish, or poultry products contributes to 20% of maternal deaths globally (Black et al , 2008). It is documented that nearly all (99%) of all maternal deaths occur in developing countries, with more than half in Sub-Saharan Africa (WHO, 2018). The Kenya Demographic and Health Survey estimates the maternal mortality ratio (MMR) to be 362/100,000 live births (KDHS, 2014). Anaemia is documented as one of the factors that cause maternal deaths in Kenya (National Council for Population and Development, 2015). In addition, studies show that anaemia contributes to one out of five maternal deaths in Kenya (Government of Kenya, 2017).

The paper focusses on maternal nutritional status, nutrition knowledge, and available intervention to address maternal nutrition. It has been documented that the focus of many programmes has been on implementing and monitoring nutrition interventions of infants and young children, leaving out pregnant or post-partum women (Kavle, J., & Landry, M., 2017). Research conducted in Laikipia County focuses on the nutritional status of pregnant women (Kiboi et al., 2016). Another study carried out in Nairobi focusing on the micronutrient status of pregnant women revealed a combination of micronutrient deficiencies among the study participants (Kenya Medical Research Institute, Aga Khan University, Nairobi and Danone Nutricia Africa and Overseas, 2016).

Available data shows iron and folate supplementation is going on for pregnant women at the level of health facilities. There is a need, however, to research and document any efforts that may be in place at the community level. The study conducted in Pumwani Maternity hospital provided important findings, confirming that anaemia is a public health problem (Okube,et al 2016). This study did not, however, seek to understand the dietary habits of the study participants and therefore a gap exists as to whether the women's nutritional status was attributable to their dietary habits. Information that exists on dietary habits of pregnant women that explores all the areas that this research sought to investigate is limited. To address the gaps, therefore, this research sought to assess the nutritional status of pregnant women making the first ANC visit during their current pregnancy in Othaya Constituency, understand their dietary habits, the factors that contribute to these habits, and the role they play in the nutritional status of the women**.**

The paper is guided by two objectives, to assess the nutritional status of pregnant women in Othaya Constituency making their first ANC visit during their current pregnancy and to establish the dietary habits of pregnant women in Othaya Constituency. It is grounded on the Social Learning Theory (S.L.T) by Albert Bandura. The SLT theory advances the claim that people learn from each other through; observation, imitation and modelling. The individual (observer) observes the behaviour of another person (model) after, which the observer imitates this behaviour and if society reinforces the behaviour, then the observer is encouraged to carry on with it. On dietary habits, children observe their parents' choice of food, how they prepare the food, and how the food is eaten. Parents act as the children's model and the children will then imitate their habits and continue with them once society reinforces them. These same

children are likely to change their dietary habits once they move to a new environment and this could again happen through observation imitation and modelling. Communities members can and indeed do learn from one another. SLT was thus suitable for use in this research because choice of food is a learned behaviour. (Ko Ester and Mojet, 2006), contend that, in humans, food choice is predominantly a learned behaviour.

As mentioned earlier, the study was conducted in Othaya , Nyeri. A descriptive cross-sectional survey design was used. A questionnaire administered by an interviewer was used to collect data from 119 pregnant women who were seeking ANC services. This study targeted pregnant women whose age was 18 years and above and who were in addition seeking ANC services for the first time during the current pregnancy. These were be required to have met the inclusion criteria and sign an informed consent form after accepting take part in the research. The pregnant women who did not have chronic illness and consented were included where as those who had chronic illnesses and did not consent were excluded. Their exclusion was based on the possibility that they would have been started on Iron-Folic Acid Supplementation (IFAS) and thus there would be more than food making a contribution to their nutritional status. The other group of women who were excluded from the study are those who had a chronic condition like HIV, tuberculosis and diabetes as these conditions have the potential to compromise their nutritional status.

Discussion of the findings.

Nutritional Status of Pregnant Women

In order to assess the nutritional status of pregnant women, the study used MUAC, which is an anthropometric method, haemoglobin (Hb) level, and dietary diversity, a qualitative measure of food intake which is a proxy for nutrient sufficiency of the diet of individuals.

Nutritional Status by MUAC Measurement

To get an estimate of nutritional status, anthropometric data for mid-upper arm circumference (MUAC) was assessed. A cut-off of <23 cm which is recommended to include most pregnant women at risk of Low Birth Weight (LBW) for their infants in the African contexts was chosen (Ververs *et al.*, 2013). Those with MUAC < 23 cm were categorized as undernourished and those with MUAC > or equal to 23 cm were categorized as having an adequate nutritional status.

The figure below shows that 9% of pregnant women seeking ANC services in Othaya Constituency, were undernourished while the remaining 91% had an adequate nutritional status. Low MUAC, available literature shows is associated with adverse maternal and birth outcomes (Roy and Sen, 2018). Therefore, in light of this, 9% of the study participants were at risk of adverse birth outcomes.

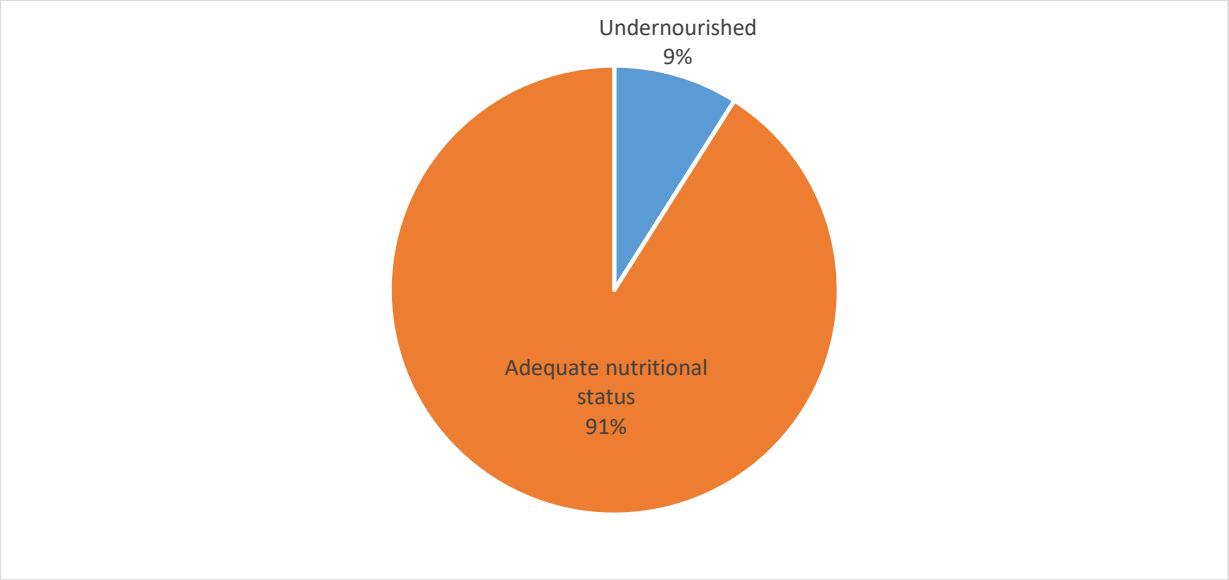

Figure 1.0: Nutritional status by MUAC measurement

Respondents' Nutritional Status by Haemoglobin (HB) Levels

Available literature reveals that haemoglobin level below 11g/dl raises the risk of pre-term birth (Bunyarit Sukrait et.al, 2013). Based on the median Hb level in this, study (12.75) and using the definition of anaemia during pregnancy (Hb < 11), participants were divided into 2 categories –those with the level of Hb< 11 and those with Hb>11. This was then assessed by the women's gestation period. 14% of the respondents had Hb<11 and 86% had Hb >11. Those who were in their 21 weeks median gestation period had Hb<11 and those who were in their 16 weeks median gestation period had Hb>11. The figure below contains the results.

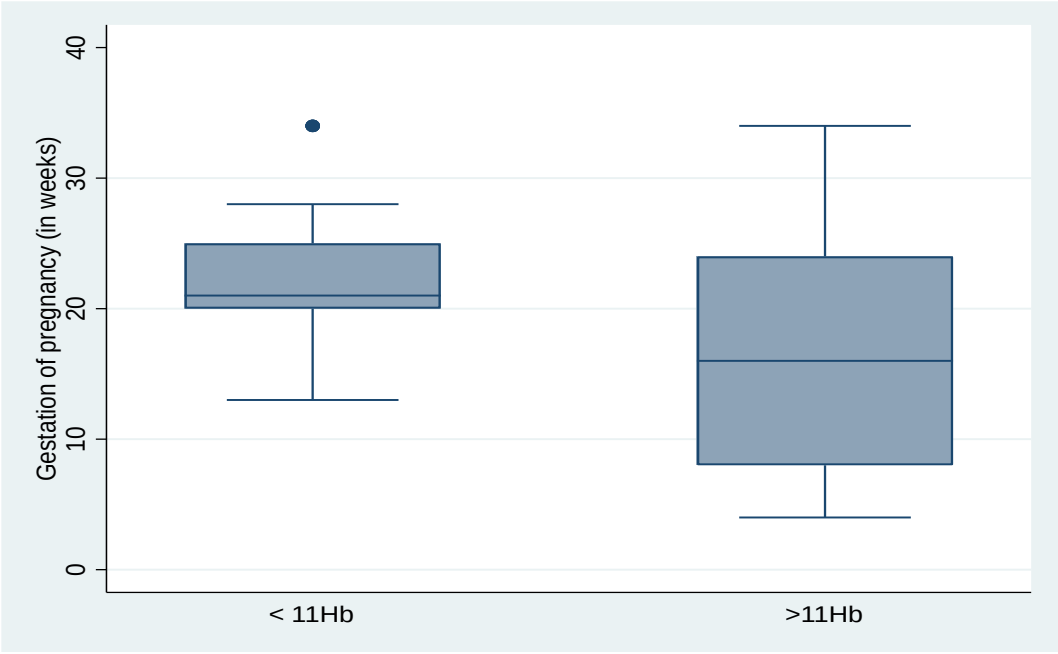

Figure 1.1 Hb Levels by gestation period

Table 1.0: Hb Levels by gestation period

Name of Ward	N	Mean Hb Levels
Iriaini	62	12.74
Chinga	18	13.35
Karima	8	12.75
Mahiga	23	10.73

When Hb level was assessed against dietary habits, the respondents who had <11Hb levels, 10% consumed < 3 food groups while 18% consumed ≥3 food groups. On the other hand, those who had >11Hb levels, 90% consumed <3 food groups and 82% consumed ≥3 food groups.

The Undernourished participants had a lower mean Dietary Diversity Score in comparison with participants who had an adequate nutritional status . Participants who had <11Hb levels had higher Mean DDS as compared to those with >11Hb levels. This could be explained by the fact that for most of them, green leafy vegetables, a very rich source of iron was not among the foods that they reported to have been habitually eating.

One of the Key Informants, a female Kenya Registered Nurse from one of the facilities, asked what her assessment of the pregnant women's nutritional status was said it was fair.

> *Res: I can say it is fair.*
>
> *Int: Why do say it is fair?*
>
> *Res: Because you may have a client, their MUAC is fine, their weight is good, but once you do their HB, it will just tell you that there is something amiss. So according to that, you will know that their diet was not comprehensive and that it did not have everything that it is supposed to have.*

A female respondent from the County level asked about the nutritional status of pregnant women in Othaya Constituency said,

> *Res: Their nutritional status is above average. This is because they have the knowledge and they have the food.*

A key informant, a female Kenya Enrolled Community nurse thought that the nutritional status of pregnant women in the health facility's catchment population is okay.

> *Int: What would you say is the nutrition status of pregnant mothers in the catchment population even by looking at the data?*
>
> *Res: It is okay.*
>
> *Int: Tell me what is meant by "it is okay"?*

Res: That they have been able to meet their nutrition status as required by the World Health Organisation and even by us because we keep on assessing them, through taking their weight, through the MUAC, even through physical examination. The physical examination is the first thing you do when the mother comes to you. You look at her and you can tell, "Something seems to be wrong. Are you eating well?" Then she may tell you that she is vomiting a lot. Then you put her on medication to stop her from vomiting because we are also able to treat them. You see a problem, you treat. That is also the best thing for us here in the health facilities. We can treat immediately; we don't need to go to the next person. You see a pregnant mother with any problem, you treat and give her medication. It is a supermarket. She comes to you and you finish for her everything that she requires.

A female key informant at the Sub-County level reported the following concerning the nutritional status of pregnant women in the Constituency:

Res: I would not say they are poorly nourished because we have some of the foods with us. I would say they are moderately nourished. They are average. They are not badly off but they have not reached the level that we want.

Respondents' Dietary Diversity

To demonstrate the average habitual dietary intake of pregnant women in the study, the 24-hours dietary recall method was used. Women were prompted to recollect all food items, snacks, included, extraordinary beverages and dishes consumed the day that preceded the interview. They were asked to describe their food consumption following their daily routine. The Women's dietary diversity (WDDS) was computed using the 9 food groups as described in the FAO (2011) dietary diversity guidelines. The WDDS was applied as a qualitative proxy indicator to assess nutrient adequacy of the pregnant women seeking ANC services in Othaya Constituency.

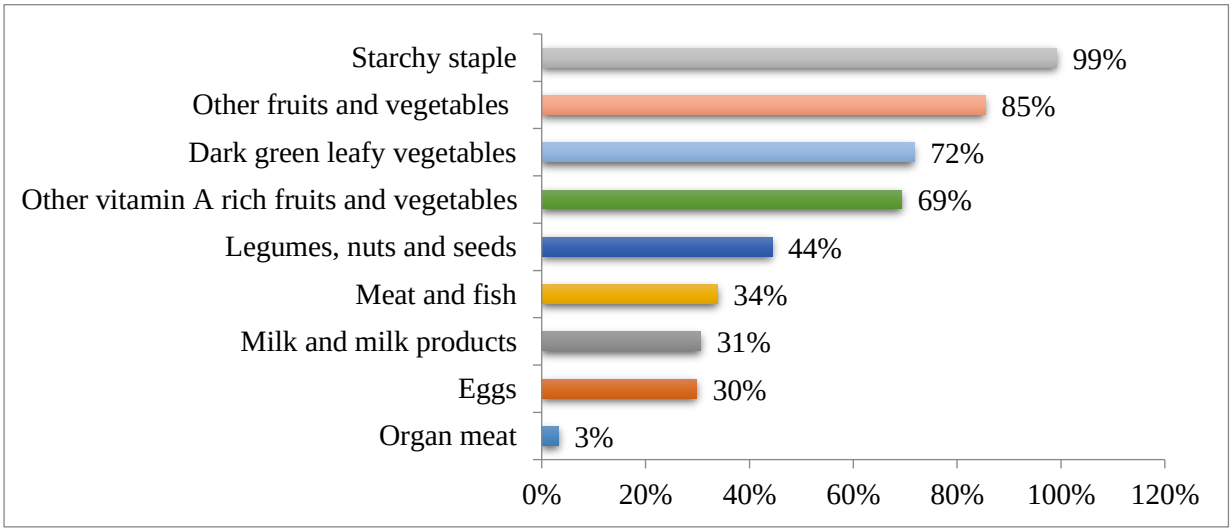

Figure 1.2 Respondents' consumption of the nine food groups the day preceding the interview

The mean dietary diversity score for the 9 food groups was 4.68±1.32 while the lowest and highest were 1 and 7 food groups respectively. The mean score was therefore used to establish cut-off points in terms of several food groups to indicate adequate or inadequate dietary diversity for the WDDS. Therefore respondents scoring ≥ 5 food groups were classified as having an adequate dietary diversity while those scoring <5 food groups as having an inadequate dietary diversity as depicted in the diagram below.

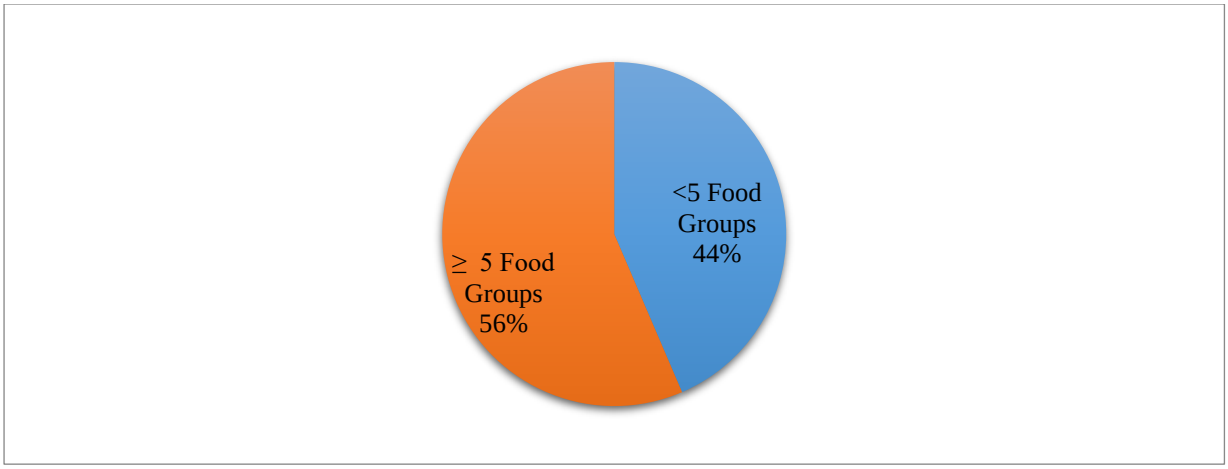

Figure 1.3: Participants' categorization by number of food groups consumed

Dietary Habits of Pregnant Women

Foods Available Locally

The paper examines the dietary habits of pregnant women by looking at the foods locally available. Food availability, according to available research, is one of the aspects attributed to people's dietary habits and people have been shown to eat more of the food that is readily available in their locality. Figure 1.4 and figure 1.5 show the foods that were reported as available in Othaya Constituency with 98% of the respondents reporting maize as one of the available foods. Vegetables were mentioned by 90% of the respondents while 85% of them mentioned legumes.

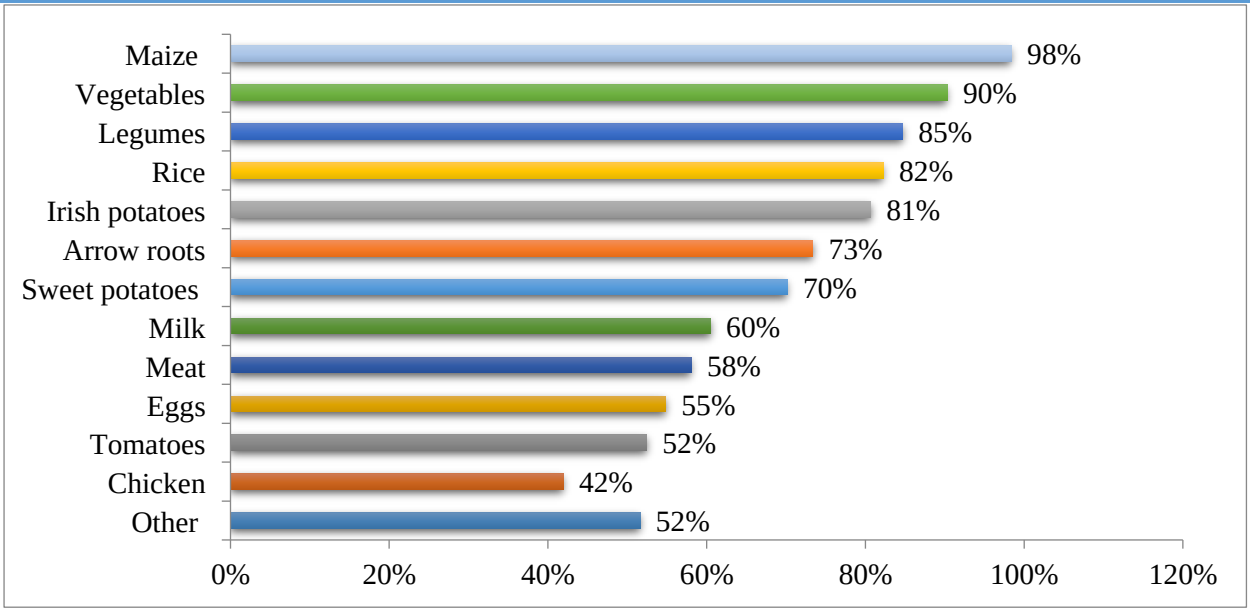

Figure 1.4: Foods available locally

On the fruits available in the Constituency, oranges were on top of the list at 73% with passion fruits coming second at 69%.

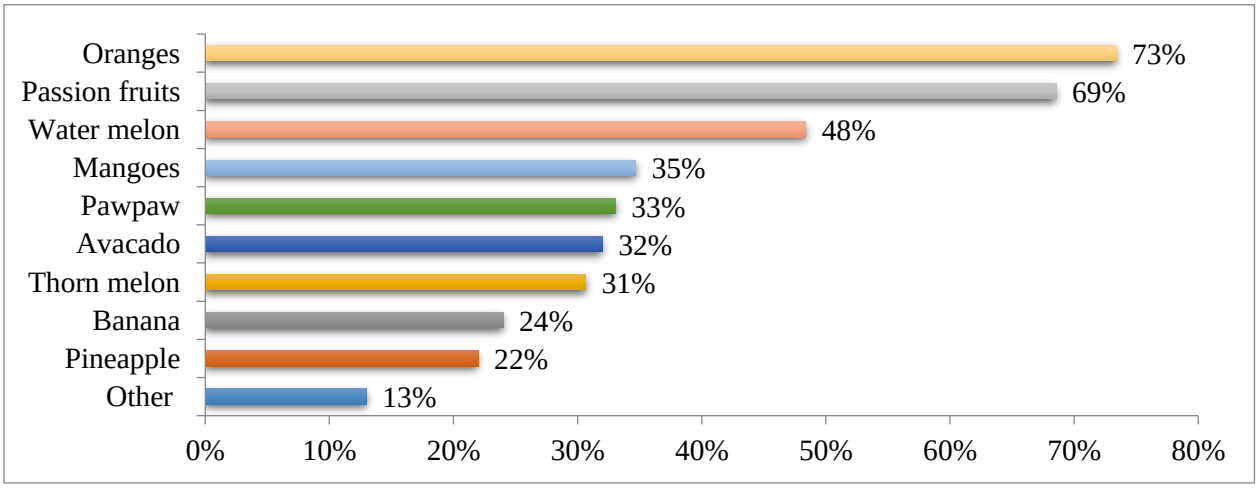

Figure 1.5: Fruits available locally

Maize topped the list of the foods produced locally having been mentioned by 117 (98%) of the respondents with beans coming second at 81%.

Table 1.2: Foods produced locally

Which of these are produced locally?	Frequency	Percentages
Maize	117	98%
Beans	96	81%
Irish potatoes	87	73%
Vegetables	87	73%
Arrow roots	73	61%
Sweet potatoes	66	55%
Milk	43	36%
Eggs	40	34%
Chicken	39	33%
Meat	37	31%
Tomatoes	34	29%
Beans	28	23%
Rice	6	5%
Wheat and wheat products	6	5%
Other	49	41%

Multiple responses

Asked if they have land on which they grow food crops, a total of eighty-eight (88) respondents reported that they did own land where they grew food crops. All the respondents were asked what their main source of food was. Half (50%) of them reported that the food they eat was purchased while 49% said came from their production. Only 1% of the respondents said that they got their food from other sources. Cash crop farming was seen as one of the factors that contributed to people in the community not growing enough food for their consumption as one of the FGD participants reported. It was reported that many people had dedicated more land to the growing of cash crops as compared to food crops hence not enough food was grown.

> ***M: What do you think is the reason most people don't grow enough food to sustain themselves?***
>
> *P: It depends on individuals*
>
> ***M: Okay...***
>
> *P2: Depending on the cash crop that is grown in that area.* (29 years old from Iriaini Ward)
>
> ***M: Okay, tell us more about the cash crop. What kind of cash crops.....?***
>
> *P2: I have not stayed for long here but you will find that many people have planted a lot of tea, and the area left for planting food is a very small portion of land, a big portion of land is occupied by cash crops.*

This observation was also made by one of the key respondents at the Sub-County level.

From the market, you can get almost everything you require. But the issue now is money. And then around the facility, this place is a tea-growing area the greatest percentage of the land, is covered with tea. So a small part of the land is what is usually kept aside for growing a little bit of maize and beans. So you find that most of the time these households go to the market to buy food and from my observation there has been some kind of poor nutrition, not necessarily for the pregnant women, but even for children and adults. When you question them here about the food that they eat, they will talk of rice and potatoes. And then the other thing affecting their nutrition is because as I have said there is a lot of tea here and so most of the time they are in the tea farms picking tea. They have very little time to take care of the nutrition part of it.

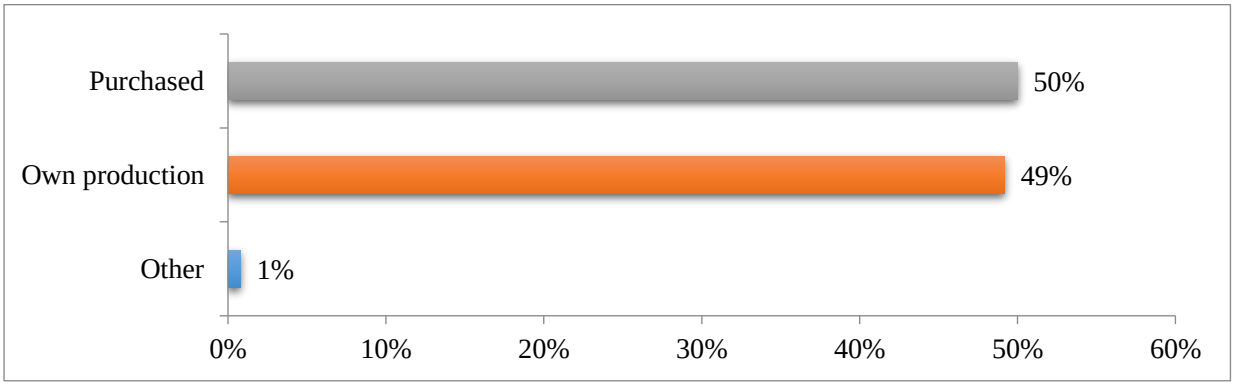

Figure 1.6: The main source of food eaten

Household Choice of Food

The decision on the food that the household consumes according to findings from this research was made by the respondent herself in 70% of the cases. Only 7% of the spouses made this decision while mothers decided 17% of the cases. Below is a table displaying these results.

Table 1.3: Household choice of food

Who, in your household makes the choice of the food you and other members eat?	Frequency	Percentages
Self	84	70%
Spouse	8	7%
Mother	20	17%
Other	7	6%
Total	**119**	**100%**

The household choice of food is maize at 85% of the respondents said that they ate maize dishes. This was followed by rice with 65% of the respondents and green leafy vegetables with less than half (40%) of those who participate in the study saying that this is one of the foods that they consume more regularly. Fruits, findings show, were consumed by 16% of the

respondents. Only 9% of the study participants said that milk, a very rich source of calcium, is one of the foods that they consume regularly.

A male Key Informant, a medical doctor in charge of one of the health facilities, asked the foods that people in the Constituency mainly consumed had this to say,

> ***Res**: Mainly ugali, rice, chapati, githeri, and mukimo. Those are the common ones.*
>
> ***Res**. Our pregnant women mainly consume food like the rest of us, ugali, rice, githeri, mukimo. Subject to the person having certain preferences. You know in pregnancy one person wants to eat one thing more than the other. But there is not a big variation between the food that the general population take and the pregnant women's take.*

Below is what another key informant, a female in charge of services at the County level had to say concerning the foods that pregnant women mainly consume,

> ***Res:** Githeri (a mixture of maize and beans) and mukimo (a mixture of maize and beans mashed with potatoes, bananas, and green leafy vegetables), which is a whole meal because it has most of the nutrients.*

Another Key Informant, a clinician in charge of one of the health facilities had the following to say:

> ***Res:** The foods that are very common here, do a lot of proteins and starch. But the greens, they are not so much into the greens, because most of them they spend money. They go buy the greens instead of planting them for themselves. So most of the food they talk about here is proteins and starch. Even when we admit them, the foods that their families and relatives bring them are food that is not rich in greens and vegetables. So we tell them that greens are also of equal value to them.*

Yet another key informant a female in charge of services at the Sub-county level said that people mainly consumed a lot of starchy foods.

> ***Res:** These people consume a lot of starch.*
>
> ***Int:** Which are some of the foods?*
>
> ***Res:** Bananas, Irish potatoes, rice, and ugali. Those that the foods that they mainly consume but once you do the health education they start realizing that they have been consuming one part of the diet.*
>
> ***Int:** How about pregnant women, which foods do they mainly consume from your assessment?*
>
> ***Res:** They eat the same food as the general population.*

A Key informant saw tea farming as an issue that affects the dietary habits of the women:

Res: *When you question them here about the food that they eat, they will talk of rice and potatoes. And then the other thing affecting their nutrition is because as I have said there is a lot of tea here and so most of the time they are in the tea farms picking tea. They have very little time to take care of the nutrition part of it. So when you ask someone to explain to you what they took from morning to evening, one will tell you that they took a mandazi (this is made of wheat and somehow similar to dough-nut) and a cup of tea because that is what they could get quickly while working at the tea plantation. So you find that there might be food but even the time to prepare a well-balanced diet at home is also an issue because most of the time they engage from morning to evening in the tea picking.*

Int: *Just mention to me, the available foods.*

Res: *From the market, they get too much rice, they also get maize flour from the shops. But we encourage them to use the whole meal if they can afford to get some maize and take it to the maize mill. They also do a few arrowroots. There are quite some arrowroots in Othaya town and also potatoes, green bananas, and vegetables. Proteins, in terms of legumes you find that most of them they buy instead of growing them on the farm.*

The Dietary habits were further computed using the 9 food groups as described in the FAO (2011) dietary diversity guidelines. The mean dietary diversity score for the 9 food groups was 2.589±1.408 while the lowest and highest were 1 and 8 food groups respectively. Findings showed that 55% of the respondents regularly consumed more than 3 food groups with the remaining 45% consuming 3 or less than 3 food groups. Below are the results.

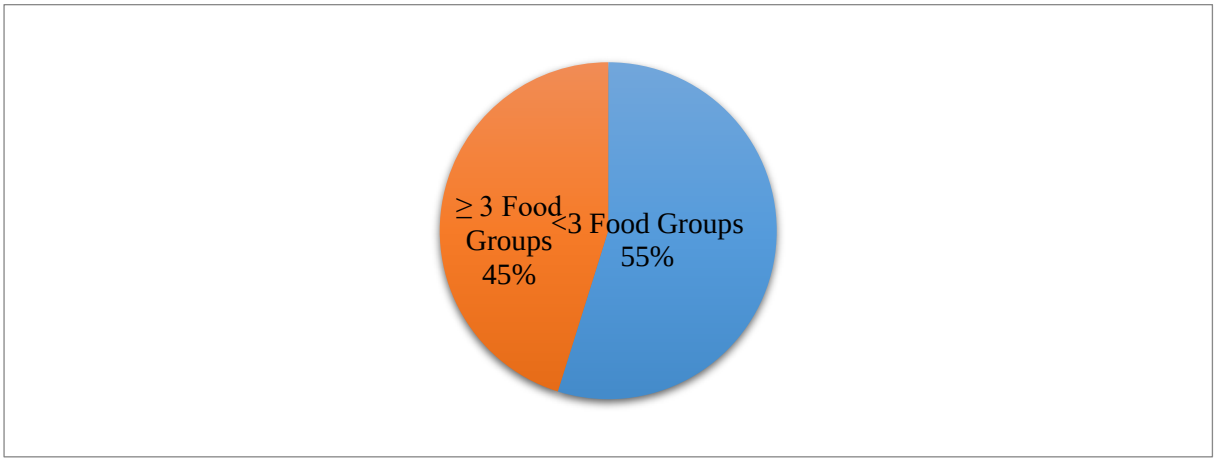

Figure 1.7 Respondents food consumption by food group

Asked why they habitually ate the food that they did 49% of the study participants said that it was out of personal preference, 29% said that the choice was guided by the fact that this is the food that is more readily available in the locality, 9% said their choice was influenced by food craving with only 8% of the participants saying that their choice of food was influenced by the nutritional content associated with their food of choice.

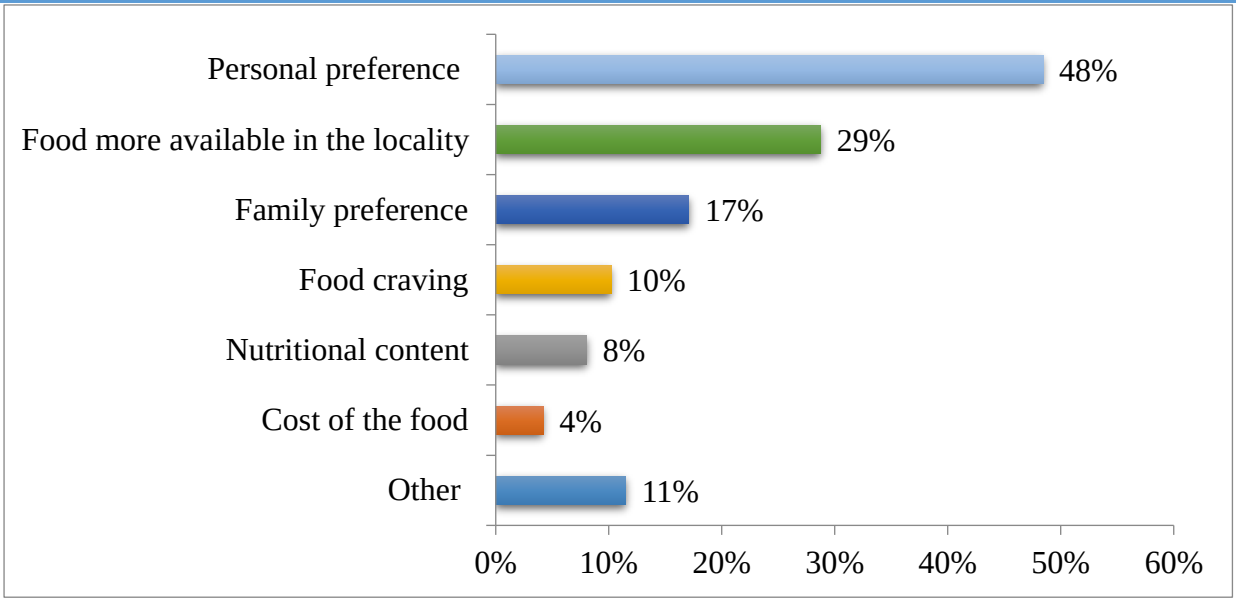

Figure 1.8: Reasons for choice of food

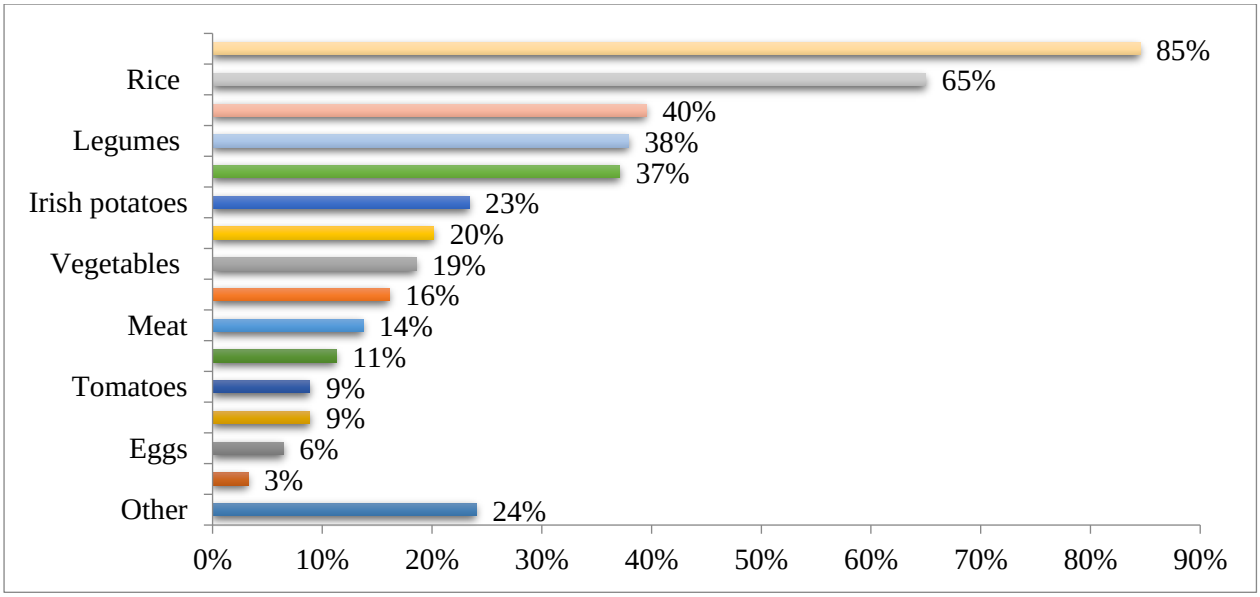

Figure 1.9: Which foods do you eat more regularly?

It is important to point out that there are certain foods the participants would have wanted to eat but not possible due affordability and the taboos in the community. The study participants, asked if there are certain foods that they would have liked to eat more regularly, more than half (52%), as presented below, answered in the affirmative. One of the key informants had this to say concerning the choice of food by the pregnant women:

> ***Int***. *And what are the reasons why they consume mainly these foods?*
>
> ***Res***. *Because they are the most readily available.*
>
> ***Int***. *Any other reason?*

***Res**. I think it is mostly about availability because the cost varies but people still take it irrespective of the cost. The cost has an effect but not majorly. I think we consume mostly what is available.*

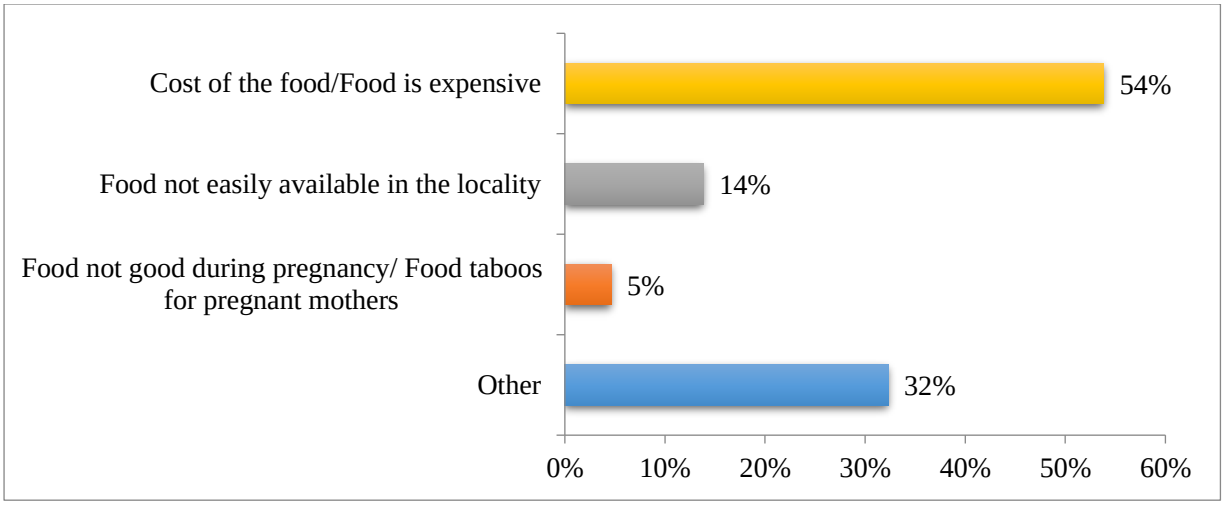

Figure 1.10: Respondents' reasons for not eating the foods as often as they wanted

The key informants brought out more the barriers in accessing the foods**.** A key informant in charge of services at the County level reported the following:

Poverty is one of them and there is a lack of knowledge for some. Many of them come to ANC in the last trimester and of course, you cannot lack those who do not attend ANC at all. Nutrition supplementation begins late for those who come late. Then there is food craving where you can have a mother craving only carbohydrates. Hyperemesis gravidarum is also another barrier where a mother is not able to eat or throws up all the food she eats.

A key informant overseeing health services in one of the health facilities had the following views:

The most common barrier is the early pregnancy symptoms. They include nausea, vomiting, abdominal pain… They might not tolerate a lot of foods between six weeks and fourteen weeks because of hormonal changes occurring in their bodies. So despite the education and all they might not be able to take as much as is needed. The other barriers come about because of the cost of food. As I had said earlier most of our clients, in their farms, there are cash crops and no places to farm the food crops. So for most of them, they have to acquire the food from the market. So, cost may also be a barrier. The other thing is availability. You have seen from the list we have provided of the commonly available food is limited. So they tend to eat what is available.

Below are the views of a male clinician in charge of one of the health facilities:

Int: *What are the barriers to pregnant women in the catchment population eating a diet that is adequate to meet their nutritional requirements? One of the things that you had mentioned earlier is finances.*

Res: *Finances, yes. I also think, looking at their way of living I think they spend more time on putting up something that can bring them money. Most people around here do a lot of tea farming and there is coffee farming. So, the places that they are putting the tea or that coffee are places that they should be putting greens or the vegetables that they may need or any other thing that they can eat. So, they use the farm mainly in a way that can bring money to them other than the way it can benefit them in terms of their health. So, I think that is also another thing.*

It was gathered that food Restrictions/Taboos played a role in discouraging the pregnant women from eating nutritious foods. There was a belief that consumption of the foods would result in the baby becoming too big, leading to difficulties during delivery. This was corroborated by the Key Informant.

Res*: Yeah, like omena. You mention omena and they say, "What is that, we don't know it, we only hear of it, we don't know how it is made?" For fish now they have no problem because they can get it. There are shops here that sell it. It is only something like omena that they shun.* (Female, Kenya Enrolled Community Nurse in charge of one of the facilities)

M: What about Culture? Does the tribe factor affect the food people eat?

P1: *Like for example I am a kikuyu and mostly Kikuyus like eating cabbage, other tribes like the Luos do not eat cabbage; they say they have not grown eating cabbage*. (25 years old from Karima Ward)

M: And what does a kikuyu person say?

P1: There is nothing that a Kikuyu cannot eat because if a Luo person cannot eat cabbage, a kikuyu person can eat fish if they get it (25 years old from Karima Ward)

M: So Kikuyus eat all types of food?

Some participants*: Yes*

P1: Not all because like some cannot eat omena, they say they are bitter. (25 years old from Karima Ward)

M: I had wanted to ask that question; if there are foods that people do not eat or are not common to them, you have said one is omena, are there other foods that people don't like eating?

P1: Managu (a traditional green leafy vegetable), some people eat and others don't eat, like myself, I cannot eat managu. (25 years old from Karima Ward)

M: What is the reason some people don't eat managu?

P3: It depends on one's upbringing, if the family I have been brought up in doesn't eat, I cannot also eat. (30 years old from Iriaini Ward)

P5: Where you are born they are not eaten and where you get married they are not eaten as well, so you cannot just start eating them. (27 years old from Iriaini Ward)

It was gathered that the pregnant women make efforts to eat a more nutritious foods notwithstanding the challenges. The study shows that about 65% try their best while 35 % do not make attempts. The figure below captures that .

This implies that with prompting and awareness creation the pregnant mothers will be keen on the nutrition status.

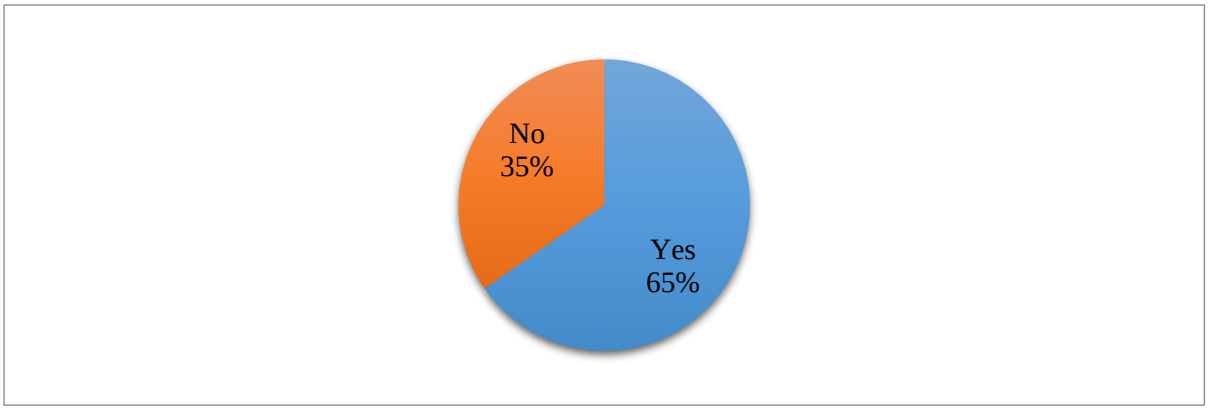

Figure 2.1 Since you conceived do you make an effort to eat a more nutritious diet?

Summary.

In summary, the respondents' HB levels showed that 14% of the respondents were anaemic. MUAC serves as a pointer of protein reserves in the body and MUAC measurements according to available literature can be a suitable indicator of protein-energy malnutrition or starvation (Tang, A.M. et al. 2016). MUAC measurements showed that 9% of the study participants were undernourished while the remaining 91% had adequate nutritional status. Findings from a research conducted among pregnant women in Pumwani hospital revealed that research participants with a MUAC of less than 23 cm had a higher prevalence of anaemia and there was a significant association between MUAC of less than 23 cm was with anaemia (O. T. Okube et al., 2016). These findings are consistent with those from a study conducted among pregnant women in rural Nepal, which found MUAC of less than 23 cm increased, significantly, the risk of developing anaemia among the women (Makhoul, Z., Taren, D., Duncan, B., *et al*. 2012). Going by these findings then the 9% women in this study whose MUAC was less than 23 cm were at an increased risk of becoming anaemic. Respondents with MUAC measurement of less than 23 cm were seen to have a lower dietary diversity score in comparison with their counterparts with MUAC measurement of 23 cm or higher while those who had Hb level of less than 11g/dl were found to have a higher dietary diversity. A possible explanation of this is that green leafy vegetables, a rich source of iron was not among the foods that these participants reported to have been habitually consuming.

The foods consumed by the pregnant women was largely influence by the availability, affordability and culture. The staple food is maize, the grain was mentioned by 85% of the respondents as one of the foods consumed more regularly while rice was mentioned by 65% of the women. On the other hand, meat was mentioned by only 14% as one of the foods that is more regularly consumed while milk was mentioned by only 9%. The finding therefore revealed that the pregnant women consumed more grain foods and this shows a consistency with findings of a study on contemporary African food habits conducted in East and West Africa whose findings showed that Africans eat more grain foods, but most of them consumed less fruits per day (Oniang'o et al., 2003). The findings are also consistent with those of a study conducted Nigeria, which showed that pregnant women consumed more carbohydrate diet compared to protein diet (Olayiwola et al., 2015). These findings are also consistent with a study carried out in Kisii whose findings revealed that the women ate what was locally available (Obwocha, A.M, Mbagaya, G.M and Were, G.M). Out of the 124 women who participated in the study, 52% said that there were foods that they would have wished to eat more often but they did not with more than half (54%) of them giving the cost of food/food was too expensive as the reason they did not eat the food they mentioned as often as they would have wanted to eat it. Meat was the food mentioned by most of the participants as that which they would have wished to eat more often. These findings are again, comparable to the study on contemporary African food habits which revealed that income is of the factors what was associated with increase in consumption of dairy products among them meat (Oniang'o et al., 2003).While, according to the dietary diversity score more than half (69%) of the study participants had consumed Vitamin A rich fruits and vegetables the day preceding interview, 31% had not. Vitamin A deficiency is, according to a research carried out in Kenya, concomitant with anaemia (Kowalski, A, Grant, F., Okuku, H., Wanjala, R., Low, J., Cole, D., Levin, C. and Girard, A.W., 2014). These women therefore, going by the findings may stand a higher risk of developing anaemia.

The paper concludes that relationship between dietary habits and nutritional status of pregnant women. The findings shows that the women habitually consumed the locally available foods with the starchy foods being the most habitually consumed. Though there is a variety of fruits that are locally available, fruits, and daily products (milk and meat) were not among the foods that the women habitually consumed.

Recommendations.

1) Findings from this research showed that women start seeking ANC services late into the pregnancy. There is a need in creating awareness and stressing the importance of staring ANC services early as recommended by World Health Organization. At least four visits is recommended. This way, it will be possible to pick up any mother whose nutritional status is not adequate and corrective measures put in place.
2) Intensify nutrition education and counselling at the community level and sensitize the community on the need to choose food based on their nutritional content promoting their nutritional status.

3) At the facility level the government, through the Ministry of Health, should ensure that HB levels are checked for every pregnant woman on the first visit that she goes to a facility to seek ANC services. This should be done by ensuring that there is always a constant supply of the reagents and facilities that are required for the test to be done. In this way, it would be possible to almost immediately put in corrective measures on those women who may be found anaemic.
4) It has been documented that nutrient-dense foods are more expensive. There are those pregnant mothers whom despite the fact that they would want to eat food that meets their nutritional needs cannot afford them owing to financial constraints. To support such women, the government and other stakeholders to support women to come up with income generating activities so that they may get some finances to buy nutritious foods that would promote their nutritional status. This could be done in forms of loans that would attract low interests. In addition, pregnant women who have financial difficulties need to be identified and support provided for them in terms of nutritious food.

References

1. African Union (2018). African leaders and stakeholders renew their call for action to end hunger by 2025 Retrieved from: *https://au.int/sites/default/files/pressreleases/33730-pr ending_hunger_pr-edited.pdf*
2. African women studies Centre, University of Nairobi and Kenya National Bureau of Statistics (2014). *Status Report on the Kenya National Food Security Nairobi*. University of Nairobi Press.
3. AGR Partners. (2013). Hidden Hunger: The Irony of a Full Belly, Retrieved from *https://agrpartners.com/wp-content/uploads/2013/08/AGR-Thought-Piece-Hidden-Hunger.pdf*
4. Ali, F., Thaver, I., & Khan, S. A. (2014). Assessment of dietary diversity and nutritional status of pregnant women in Islamabad, Pakistan. *Journal of Ayub Medical College Abbottabad*, *26*(4), 506-9·
5. Alive and Thrive. (2018). Integrating Proven Maternal Nutrition Interventions into Antenatal Care Programs: How We Can Optimize Strengths and Avoid Missed Opportunities in India (2018) Retrieved from *https://www.aliveandthrive.org/wpContent/uploads/2018/06/MN BriefMay2018.pdf*
6. Assefa, N., Berhane, Y., & Worku, A. (2012). Wealth status, mid upper arm circumference (MUAC) and antenatal care (ANC) are determinants for low birth weight in Kersa, Ethiopia. *PloS one*, *7*(6), e39957.
7. Barbosa, L. B., Vasconcelos, S. M. L., Correia, L. O. D. S., & Ferreira, R. C. (2016). Nutrition knowledge assessment studies in adults: a systematic review. *Ciencia & saude coletiva*, *21*(2), 449-462.
8. Bartunen,O. K.(2016). *Nutrition Knowledge, Attitudes and Nutrition-Related Practices among Lactating Women in Marigat Sub-Location, Baringo County* (Unpublished Thesis) University of Nairobi

9. Bhutta, Z. A., Ahmed, T., Black, R. E., Cousens, S., Dewey, K., Giugliani, E., & Shekar, M. (2008). What works? Interventions for maternal and child undernutrition and survival. *The lancet*, *371*(9610), 417-440.
10. Bhutta, Z. A., Das, J. K., Rizvi, A., Gaffey, M. F., Walker, N., Horton, S. & Maternal and Child Nutrition Study Group. (2013). Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost?. *The lancet*, *382*(9890), 452-477.
11. Black, R. E., Allen, L. H., Bhutta, Z. A., Caulfield, L. E., De Onis, M., Ezzati, M., ... & Maternal and Child Undernutrition Study Group. (2008). Maternal and child undernutrition: global and regional exposures and health consequences. *The lancet*, *371*(9608), 243-260.
12. Bookari, K. A. A. (2017). Knowledge of nutrition and gestational weight gain during pregnancy–exploring pregnant women's side of the story.
13. Bwibo, N. O., & Neumann, C. G. (2003). The need for animal source foods by Kenyan children. *The Journal of nutrition*, *133*(11), 3936S-3940S.
14. Carmody, T. P., Istvan, J., Matarazzo, J. D., Connor, S. L., & Connor, W. E. (1986). Applications of social learning theory in the promotion of heart-healthy diets: The Family Heart Study dietary intervention model. *Health Education Research*, *1*(1), 13-27.
15. Chakona G. and Shackleton C. (2019). Food Taboos and Cultural Beliefs Influence FoodChoice and Dietary Preferences among PregnantWomen in the Eastern Cape, South Africa, Nutrients2019,11, 2668; doi:10.3390/nu11112668
16. Chaman-Ara, K., Sharif, S., & Bahrami, M. A. (2018). Challenges and Barriers to Pregnant Women's Nutrition: Policy Recommendations. *Journal of Nutrition and Food Security*, *3*(2), 60-64.
17. Chambers, S., Lobb, A., Butler, L. T., & Traill, W. B. (2008). The influence of age and gender on food choice: a focus group exploration. *International journal of consumer studies*, *32*(4), 356-365.
18. Cochran, WG (1977). Sampling Techniques, 3rd edition., New York: Wiley
19. da Mota Santana, J., de Oliveira Queiroz, V. A., Brito, S. M., dos Santos, D. B., & Assis, A. M. O. (2015). Food consumption patterns during pregnancy: a longitudinal study in a region of the North East of Brazil. *Nutricion hospitalaria*, *32*(1), 130-138.
20. Daniel, S., Gnanaraj, G. P. S., & Sharmine, E. (2016). Effect of nutrition education among pregnant women with low body mass index: a community based intervention. *International Journal of Community Medicine and Public Health*, *3*(11), 3135-3139.
21. Danielewicz, H., Myszczyszyn, G., Dębińska, A., Myszkal, A., Boznański, A., & Hirnle, L. (2017). Diet in pregnancy—more than food. *European journal of pediatrics*, *176*(12), 1573-1579.
22. Darmon, N., & Drewnowski, A. (2015). Contribution of food prices and diet cost to socioeconomic disparities in diet quality and health: a systematic review and analysis. *Nutrition reviews*, *73*(10), 643-660.
23. Elfil, M., & Negida, A. (2017). Sampling methods in Clinical Research; an Educational Review. *Emergency (Tehran, Iran)*, *5*(1), e52.

24. Fakier, A., Petro, G., & Fawcus, S. (2017). Mid-upper arm circumference: a surrogate for body mass index in pregnant women. *South African Medical Journal*, *107*(7), 606-610.
25. FAO (2013). *Guidelines for measuring household and individual dietary diversity*. Food and Agriculture Organization of the United Nations.
26. FAO .(2007). Nutritional Status Assessment and Analysis, Nutritional Status
27. FAO, F. Minimum dietary diversity for women: a guide for measurement. 2016. *Rome: FAO*.
28. FAO, IFAD, UNICEF, WFP, WHO. (2017).The state of food security and nutrition in the world 2017. *Building resilience for peace and food security. FAO, Rome. URL: http://www. fao. org/3/a-i7695e. pdf (Accessed 16 May 2019).*