UNIVERSITY OF NAIROBI

DEPARTMENT OF SOCIOLOGY AND SOCIAL WORK

DIETARY HABITS AND NUTRITIONAL STATUS OF PREGNANT WOMEN: A STUDY OF PREGNANT WOMEN SEEKING ANC SERVICES IN OTHAYA CONSTITUENCY, NYERI COUNTY, IN KENYA

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DECLARATION

This is my original work no other student has made a submission of the same project in the past.

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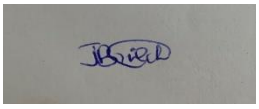
Signature: 

DEDICATION

I dedicate this work to my eldest brother Eustace King'ori for the irreplaceable role he played and the invaluable sacrifices he made towards my education. I remain forever so very grateful and indebted to him.

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LIST OF ABBREVIATIONS

AU	-	Africa Union
ANC	-	Antenatal Care
EGWG	-	Excess Gestational Weight Gain
FAO	-	Food and Agriculture Organisation
FGD	-	Focus Group Discussion
HB	-	Haemoglobin
KDHS	-	Kenya Demographic and Health Survey
KHIS	-	Kenya Health Information System
KIHBS	-	Kenya Integrated Household and Budget Survey
ICN	-	International Conference on Nutrition
IFAS	-	Iron and Folic Acid Supplementation
IFAD	-	International Fund for Agricultural Development
LBW	-	Low Birth Weight
MMR	-	Maternal Mortality Ratio
MUAC	-	Mid-Upper Arm Circumference
NGO	-	Non-Governmental Organisation
SDGs	-	Sustainable Development Goals
UoN	-	University of Nairobi
UN	-	United Nations
UNICEF	-	United Nations International Children's Emergency Fund
UNFPA	-	United Nations Population Fund
USA	-	United States of America
VAD	-	Vitamin A Deficiency
WDDS	-	Women's Dietary Diversity Score
WFP	-	World Food Programme
WHO	-	World Health Organisation

ABSTRACT

Owing to increased nutritional requirements, pregnant women stand a higher risk of malnutrition. Their nutrition is of paramount importance as it affects not only their health and survival but that of their unborn babies. It is, therefore, necessary that these women practice dietary habits that are promotive of good nutritional status and thus health. The available evidence, however, shows that several nutritional deficiencies and conditions exist among pregnant women, many of which are attributable to a diet that does not meet their nutritional requirements. Globally, existing estimates show that 38.2% and 39% of pregnant women suffer from anaemia in the world and Africa respectively. Iron deficiency anaemia is one of the factors that contribute to 20% of maternal deaths globally. In Kenya, it has been documented that anaemia is among the factors that contribute to maternal deaths. This study, which was conducted in Othaya Constituency sought to understand the contributions of dietary habits on the nutritional status of pregnant women seeking ANC services in the Constituency. The following were the objectives of the study: To assess the nutritional status of pregnant women in Othaya Constituency making their first ANC visit during their current pregnancy; to establish the dietary habits of pregnant women in Othaya Constituency; to determine the factors influencing dietary habits among pregnant women in Othaya Constituency; to examine the role of dietary knowledge on the nutritional status of pregnant women making their first ANC visit during their current pregnancy in Othaya Constituency; to identify and document existing strategies which address the dietary habits and nutritional status of pregnant women in the Constituency. The study was grounded on the Social Learning Theory (SLT) and Symbolic Interaction Theory. The study used a descriptive, cross-sectional survey design which employed a mixed-method approach. A questionnaire administered by an interviewer was used to collect data from 119 pregnant women. Qualitative data were gathered by use FGD with the pregnant women and in-depth interviews with key informants. The hospital records which included the ANC register were used as the sources from which secondary data were retrieved. The maternal and child health booklet too was used as a source of secondary data. Hb levels, MUAC, and Women Dietary Diversity Score were used to assess the nutritional status of the women. To better understand the existing strategies to address maternal dietary habits and nutritional status in-depth interviews were carried out with Key Informants. Quantitative data were analysed using SPSS while qualitative data were analysed according to thematic areas. 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 $\geq$ 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 study also established that pregnant women had good nutritional knowledge. However, their choice of food was not based on the knowledge as most of them reported basing their choice of food on other factors like individual food preference or family food preference. A significant relationship was established between household size, the occupation of the respondent, and their dietary habits. There was also a relationship between culture, household income, education level and the women's dietary habits. To more effectively address the dietary habits and nutritional status of pregnant women, there is a need to intensify nutrition education and counselling at the community level. Provide income-generating activities for pregnant women who have financial constraints so that they may generate some income to enable them to purchase nutritious foods.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

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. Although everyone needs to be adequately nourished to live a healthy and productive life, 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, Z. A., 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). Despite these efforts and others, the state of Africa's nutrition is characterized by high levels of malnutrition. Recent statistics show Africa to suffer from multiple burdens of malnutrition; under-nutrition, overweight/obesity, non-communicable diseases, and micronutrient deficiencies. Iron deficiency anaemia remains significantly high with 39% (more than 76.7 million) of women within the age of 15-49 years affected by anaemia. This makes a total of 15% global burden of which Eastern Africa is reported to have about 22 million (FAO, 2017). In Sub-Saharan Africa, Kenya included, many women continue to suffer from poor nutritional status with evidence showing that they enter pregnancy undernourished, suffer from or develop iron deficiency anaemia. 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). National surveys show that 31%, of the Kenya population, translating to 3 out in 10 people not have adequate food or money to purchase food with 36.1% and 32% living below the overall poverty line and the food poverty line respectively while 8.6% have been reported to experience extreme poverty (KDHS, 2014, KNBS, 2015/2016).

Available data concerning the nutritional status of pregnant women in the country is not disaggregated by Constituency, this presents a challenge in establishing the situation specific to Othaya constituency. However, findings from the Kenya micronutrient survey conducted in 2011 showed that 16% of rural women were either overweight or obese while 36% of pregnant women in the rural areas had folate deficiency (Government of Kenya, 2011). On dietary habits, maize, beans, sweet potatoes, and assorted vegetables are the main food crops grown in Nyeri County where Othaya Constituency is located (Nyeri County Government, 2018). It was important to establish whether these are the foods that the community in Othaya and particularly pregnant women mainly consumed.

Measures that have been put in place to address the nutritional status of pregnant women in Kenya include iron and folate supplementation that is going on at health facilities with available data on

KHIS showing that the supplementation is going on in Othaya Constituency as well. Commercial food fortification, as has been documented, targets the entire population including pregnant women. In addition, there are efforts by development partners like USAID which support various projects targeting pregnant women. There is inadequate data in this area of research and therefore the need to establish the situation in Othaya Constituency. This research, therefore, was seeking to establish and document all interventions which have been put in place to address maternal dietary habits and nutritional status.

1.2 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 is a many pregnant women whose consumption of meat, vegetables, fruits, and dairy products remains inadequate. This situation, available literature shows is mainly experienced in low and medium-income countries where several nutritional deficiencies are common in existence (WHO, 2016). At 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., and 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).

Notably, most studies have been focusing on dietary patterns and not much research has been conducted 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, O.T., Mirie, W., Odhiambo, E., Sabina, W. and Habtu, M, 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. In addition, the research aimed at exploring the dietary knowledge of the study participants and the role this knowledge played in their dietary habits and thus their nutritional status. Additionally, the study endeavoured to find out the strategies that are in place to address dietary habits among pregnant women with the view of improving their nutritional status.

1.3 Research Questions

The following are the questions that this research was seeking answers to:

i. What is the nutritional status of pregnant women making their first ANC visit during their current pregnancy in Othaya Constituency?
ii. What are the dietary habits of pregnant women in Othaya Constituency?
iii. Which factors influence the dietary habits of pregnant women making their first ANC visit during current pregnancy in the Constituency and what is their role in the women's nutritional status?

iv. How does dietary knowledge influence the dietary habits of pregnant women making their first ANC visit in the Constituency?
v. Which strategies exist to address the dietary habits and nutritional status of pregnant women in the Constituency?

1.4 Objectives of the Study

1.4.1 Main Objective of the Study

To examine the contribution of dietary habits on the nutritional status of pregnant women seeking ANC services for the first time during their current pregnancy in Othaya Constituency.

1.4.2 Specific Objectives of the Study

i. To assess the nutritional status of pregnant women in Othaya Constituency making their first ANC visit during their current pregnancy.
ii. To establish the dietary habits of pregnant women in Othaya Constituency.
iii. To determine the factors influencing dietary habits among pregnant women in Othaya Constituency.
iv. To examine the role of dietary knowledge on the nutritional status of pregnant women making their first ANC visit during their current pregnancy in Othaya Constituency.
v. To identify and document existing strategies that address the dietary habits and nutritional status of pregnant women in the Constituency.

1.5 Justification of the Study

Available literature shows that there is a need for more attention on the nutrition of pregnant women. The research had its focus on the dietary habits of pregnant women and how these habits affect their nutritional status. The researcher has a keen interest in maternal nutrition having, during the course of her work handled data on maternal and child nutrition. The researcher became much more interested in this subject through reading and getting exposed to the effects of maternal nutrition not only on the health of the mother but the health of her unborn child as well, entire families, and communities. Having been born and raised in Othaya Constituency, the researcher has had the benefit of witnessing changes in the community from a time when people owned relatively bigger pieces of land to the current situation when as a result of land sub-division people

now own smaller pieces. This affects food production and it could mean that some families are not able to produce sufficient food. Also, according to the researcher's observations, fewer families own livestock as opposed to the past where nearly every family owned at least a cow that produced milk for the family. The researcher as a result has been pondering what these changes may mean to the diet of a pregnant woman and her nutritional status hence the interest in this topic of research.

There is limited research that has been conducted in Othaya Constituency regarding the subject the researcher's is interested in. This research therefore would be beneficial as it will make a contribution to the body of knowledge by highlighting the situation in Othaya Constituency. The research would therefore be beneficial to students and academicians who are interested in this phenomenon and could be used as a basis for further research. On the utility of the research, by focusing on Othaya Constituency, which is in Nyeri County, this research will address the unique needs of the County, which could aid in the formulation of policies that will address these unique needs. The findings may therefore be used by the County Government of Nyeri to formulate policies and interventions on maternal nutrition. The findings may also be used by the Nutrition and Dietetics Unit at the National level to create policies and interventions on maternal nutrition in areas with similar characteristics. Development partners working towards addressing maternal nutrition may also benefit from the findings as they seek to put in place interventions addressing maternal nutrition in areas with similar characteristics.

It is also expected that the research will be beneficial to pregnant women. Their participation in the research may act as a trigger that will cause them to question their dietary habits and as a result, reconsider their choice of food embracing diets that are more promotive of their nutritional status. It has been documented that women's contribution in determining their families' diets is fundamental and so families are expected to benefit from this research as mothers opt for more nutritious diets. Ultimately this would have a ripple effect on the community and result in a community with improved nutritional status and improved health.

1.6 Scope of the Study

"Dietary Habits and Nutritional Status of Pregnant Women: A Study of Pregnant Women Seeking ANC Services in Othaya Constituency, Nyeri County, in Kenya" was carried out in Othaya

Constituency through a descriptive survey design. The research focused on pregnant women seeking ANC services at any of the four selected health facilities: Gichiche Health Centre in Chinga Ward, Othaya Sub-County (Level 4) Hospital in Iriaini Ward, Witima Health Centre in Karima Ward, and Kamoko Dispensary in Mahiga Ward. The research was aimed at establishing the study participants' nutritional status. This was done using MUAC, Hb and Dietary Diversity.

The research sought to examine the factors influence dietary habits among pregnant women and how this contributes to their nutritional status. Through the research, the researcher sought to assess the dietary knowledge of the study participants and how this influences their dietary habits and their nutritional status. Further, the research sought to examine existing strategies which are aimed at addressing the dietary habits of pregnant women with a view to improving the women's nutritional status. Health workers at the County, Sub-County and facility level will be interviewed to mainly establish the interventions which are in place to address maternal dietary habits and nutritional status. Owing to resource constraints, the study was carried out in only the four health facilities with all the participants being drawn from any of them. Further, qualitative data from all the 119 women were collected only from women seeking ANC services for the first time during their current pregnancy. For the qualitative data, however, this was collected from women who had sought ANC services more than once, which is because their nutritional status was not being assessed. All the research participants were aged eighteen years and above. Pregnant women who had not sought ANC services at all or those who had not sought ANC services from any of the four health facilities were excluded from the research.

Findings from this study, therefore, may not apply to women who are not pregnant. Additionally, the findings may not apply to other areas which do not share similarities with the study area. The findings, however, may apply to women who have similar characteristics and to areas with similar characteristics, including Counties in Kenya, with similar characteristics as Othaya Constituency.

1.7 Definition of Key Terms

Dietary habits mean the choice of food people usually make and eat.

Nutritional status means the state of the body concerning the consumption and utilization of food.

Optimum nutrition means that a person is getting and utilizing crucial nutrients in the right amounts as required by the body while also providing a reserve. A person's nutritional status can be either good or poor.

Good nutritional status refers to the consumption of a well-balanced diet, which provides all the vital nutrients to meet the body's requirements.

Poor nutritional status means insufficient or even an intake that is excessive or poor utilization of nutrients to meet the nutritional requirements of the body.

Dietary diversity is defined as the number of different foods or groups of foods consumed over a specified reference period. Dietary diversity is a proxy for nutrient adequacy of the diet of individuals.

A dietary diversity score is a measure of nutrient adequacy or an indicator of a healthy diet.

A pregnant woman means a woman who is carrying a developing baby in her womb/uterus.

Malnutrition means is a situation where an individual suffers from nutritional deficiency or excess. It includes both undernutrition and over-nutrition. Malnutrition is, therefore, an umbrella term for poor nutrition, whether that is excess consumption of nutrients or inadequate consumption or absorption of one or more nutrients

Low birth weight is weight at birth less than 2500 g (5.5 lb).

Haemoglobin (Hb) is the predominant protein found in red blood cells. It aids in the circulation of oxygen around the body and transportation of carbon dioxide from tissues to the lungs

Mid-Upper Arm Circumference (MUAC) is an index of body mass and is usually measured using a MUAC tape that is placed around the middle of the upper arm.

CHAPTER TWO

REVIEW OF RELATED LITERATURE AND THEORETICAL FRAMEWORK

2.1 Introduction

In this chapter, the literature that is relevant to this research is reviewed and discussed to examine the works of other scholars as well as their findings on dietary habits regarding nutritional status. The review considers practices in as wide as possible a range of geographical locations to help with establishing the gap in research that the study endeavoured address. The review of the literature was done according to the objectives of the research. Additionally, contained herein, is a review of relevant theoretical perspectives that form the logical foundation, or the backbone, from which the structuring of the researcher's thoughts comes.

2.2 Review of Empirical Literature

2.2.1 Nutritional Status of Pregnant Women

Nutrition requirements vary by age and gender and thus the need for a life-cycle approach in addressing nutrition issues. Optimum nutrition is a requirement for everyone at every stage of life if they are to stay healthy. A diet lacking essential nutrients or containing too many of them can be detrimental to health. And although optimum nutrition is important for everyone, pregnant women and nursing mothers require special attention when it comes to nutrition. In pregnant women, inadequate nutrition impacts negatively on the foetus (Vanhees et al., 2014). For the pregnant mother, nutrition equips her for delivery and postnatal recovery and poor nutrition is associated with gestational diabetes and pre-eclampsia. (Ho A, et al., 2016). Poor nutrition, according to available evidence affects not only the individual capability but also impacts the potential of the whole nation. It has been documented that through impairing children's physical and mental growth, insufficient nutrition of mothers during pregnancy can have negative effects on the development process of countries (Yakoob and Lo, 2017). Twelve out of the seventeen Sustainable Development Goals contain indicators that are very relevant to nutrition, which shows that nutrition has a critical role in achieving the SDGs and is central to the Vision 2030 agenda (FAO, IFAD, UNICEF, WFP and WHO, 2018).

A study involving 153 pregnant women conducted in Southern Ethiopia showed that the women’s diets did not meet most of the recommended nutrients intake. This study revealed, that there were

negative effects on the women's nutritional status (Kuche et al., 2015). Findings from The Kenya National Micronutrient Survey which was undertaken in 2011 show that the highest prevalence of anaemia, iron deficiency, and iron deficiency anaemia was observed among pregnant women at 41.6%, 31.6%, and 26% compared to non-pregnant women at 21.9%, 21.3%, and 14.0% respectively. Pregnant women, the findings too revealed, had also the highest prevalence of vitamin A deficiency while non-pregnant women had a prevalence of 1.1%. A study carried out among pregnant women in Nairobi and, which aimed at establishing their micronutrient status showed that 21% of them had a combination of micronutrient deficiencies, 19% had anaemia characterized by low hemoglobin, 36% had iron deficiency and 12% had iron deficiency anaemia. 53% of the women had vitamin A deficiency while 1% had VAD (Kenya Medical Research Institute, Aga Khan University, Nairobi and Danone Nutricia Africa and Overseas, 2016).

Various methods may be employed in assessing an individual's nutritional status. They include anthropometric assessment, biochemical assessment, clinical assessment, dietary assessment, and food security assessment (Food and Nutrition Technical Assistance III Project FANTA, 2016). In this study, MUAC, which is an anthropometric method, haemoglobin (Hb) level, and dietary diversity were used. MUAC, which is an index of body mass, is usually measured using a MUAC tape that is placed around the middle of the upper arm (FAO, 2007). MUAC measurements can be useful as an indicator of protein-energy malnutrition or starvation. This is mainly in situations where measurement of height and weight might not be practicable (Tang, A.M. et al. 2016). Because MUAC does not differ much during pregnancy, it is a suitable measure of nutritional status (Assefa et al., 2012). Pregnant women with MUAC measurements of <23.0 cm are regarded as thin in the measurement of MUAC. Low MUAC is concomitant with adverse maternal as well as birth outcomes. A review of studies using MUAC among pregnant women showed that MUAC is a good pointer of pregnancy outcomes (Roy S and Sen J., 2018). In South Africa, findings from research carried out among pregnant women showed that MUAC could reliably be used to assess nutritional status (Fakier A. et al., 2017). In Laikipia County, Kenya, available evidence reveals a correlation between MUAC and the nutritional status of pregnant women (Kiboi et al., 2016)

Iron is a critical nutrient requisite for haemoglobin, and hence the production of red blood cells. It is a vital part of the haemoglobin molecule. Among the conditions that necessitate an increase in

red blood cells in the development of a foetus during pregnancy hence the need for pregnant women to have sufficient iron levels. When dietary iron intake cannot meet iron needs, iron deficiency ensues. Iron deficiency can cause anaemia, which results when haemoglobin (Hb) concentration in the blood is lower than is expected. This is what is referred to as "Nutritional anaemias" (World Health Organization; 2017). Low Hb is a risk factor in pregnancy. A study carried out among pregnant women in India found food intake as one of the contributing factors of Hb level that was below normal thus resulting in anaemia (Khandat, 2014). In the same study, the prevalence of anaemia had a relationship with low consumption of proteins. An evaluation and meta-analysis of studies addressing the association of haemoglobin and adverse pregnancy outcomes revealed that haemoglobin level below 11g/dl raises the risk of pre-term birth (Bunyarit Sukrait et al., 2013).

Dietary diversity, which is a qualitative measure of food intake is a proxy for nutrient sufficiency of individuals' diets (FAO, 2010). Research shows that when biochemical data is unavailable, dietary intake is a good proxy indicator of measuring nutrition deficiencies (Bwibo and Neumann, 2003). Since the researcher may not get sufficient biochemical data, then the use of the dietary diversity questionnaire will help measure the dependent variable; nutritional status (WHO, 2008). It has been documented that, dietary diversity in pregnant women is positively associated with nutrient intake and nutritional status, and therefore it is central in ensuring sufficient nutrient intake and nutritional status among women who are pregnant (Kiboi et al., 2016).

These studies provide useful information on the nutritional status of pregnant women. The researcher however observes that they were carried out in areas with different characteristics from Othaya, which is the area the research is interested in. Findings from these studies may not, therefore, be replicated in Othaya hence the need to conduct this research to help document the situation in the Constituency. Additionally, the researcher observes that these studies focused on all pregnant women and seeking ANC services and not just those who were making the first visit. It is not documented whether these women had already been started on nutritional supplements and therefore it is not clear if nutritional supplements played a role in the women's nutritional status. This study, by focusing on the women who will be seeking ANC services for the first time, will exclude those who will have been started on nutritional supplements and thus.

2.2.2 Dietary Habits of Pregnant Women

Globally, there is a wide range of dietary habits, which are influenced by various factors. People's dietary habits may not always impact positively on their nutritional status. Results from a longitudinal study carried out among pregnant women in Brazil showed that participants' adoption of dietary habits changed throughout the evaluated trimester of pregnancy. This, findings revealed, was especially for the groups of sugar, sweets, fruit, coffee, and fried snacks (Santana et al., 2015).

In Nigeria, research whose aim was to assess the dietary patterns of pregnant women revealed that the women's diet contained more carbohydrates compared to proteins (Olayiwola et al., 2015). In Kenya, maize which is the main staple diet, evidence shows, accounts for over 60% of the total staple food caloric intake and 36% of total caloric intake with the average person in Kenya consuming 88 kilograms of maize per year (Mohajan, 2014). These findings are similar to those of Olielo, (2013) who contends that 'ugali' or maize meal mash, a paste that is thick and is cooked using maize flour, is the primary staple carbohydrate food among Kenyans and is consumed by 88% of households at least four times in a week. A study conducted among pastoral and non-pastoral women in Kenya identified a total of 40 food items. However, among the 40, only seven items were consumed by 50% of women in both zones. The study found low consumption of some food items including milk, meat vegetables, and fruits (Olimba, 2018). These findings may not apply to Othaya Constituency where evidence shows that most people depend on agriculture.

Based on the socialization process, there are differences in the consumption patterns among men and women in Kenya, evidence shows. This determines what each gender calls the main food thus bringing a gender perspective in food. It is worth noting that what either gender calls the main food, could either be promotive of optimum nutrition and thus health, or could have negative effects on one's nutritional status and thus his/her health. Findings from a research carried out by the University of Nairobi African Women's Study Centre showed rice and *githeri/muthokoi* as the two main foods for women at 71% and 58.8% and consumption. On consumption of meat, 61.9% of men said this was their main food while 38.1% of women said that meat was their main food. This was attributed to the ownership of livestock by men, which the men would slaughter and eat the prime parts while women and children were left to eat the inner parts such as intestines and tongue (The University of Nairobi African Women's Study Centre, 2014). This study, however,

did not assess the participants' dietary knowledge, an area that the researcher will focus on in the proposed research. Further, the research took place in different locations and the findings might not apply to Othaya Constituency.

2.2.3 Factors that Influence Dietary Habits

Research shows that various factors influence and even shape people's dietary habits. Available evidence shows that dietary habits vary from one community to another, from one ethnic group to another as well as from one individual to another. A variety of reasons have been put forward in support of the choice of food that people make. They range from a culture where people from different cultural groups establish their dietary habits which they pass on from one generation to another, social influence, food availability, individual preferences, and individual knowledge on nutrition, media, and advertising. Other factors that dietary habits are attributable to include geographical factors such as climate and topography.

Various factors may determine the dietary habits of pregnant women, evidence shows. Culture, as indicated earlier influences people's dietary habits, and some cultures forbid the eating of certain foods such as rabbit meat. For some women, their dietary habits may be affected by food taboos, as a result, they are likely to avoid some food items. The food taboos have the potential to have negative effects on women's nutritional status (Mohamad M. and Yee Ling C. 2016). In China, findings from a study carried out among pregnant women showed a high likelihood of the study participants adhering to the traditional diet recommendations such as avoiding certain foods like rabbit meat. (Gao et al., 2013). A study among pregnant women in Khartoum showed that study participants refrained from eating particular foods because of food taboos, personal and community reasons (Hadil Mohamed Hassan Tahir et al., 2016).

Reasons are advanced in support of the taboos and food restrictions. In Tanzania, findings from a study conducted among pregnant Maasai women revealed that there were traditions that govern the foods and even the quantity of food women ate during pregnancy. Study participants reported that they were not supposed to eat 'too much and they were to avoid eating food such as meat and beans. This, according to the findings, is because when eaten, such foods make the baby too big resulting in difficulties during delivery (Lennox et al, 2017). Such food restrictions deny members

of the particular cultural group of the important nutrients contained in such 'forbidden foods'. Findings from the literature review revealed that food choice among pregnant women was subjective to food aversions, economic constraints, and availability of food for the household (Kavle, J., & Landry, M., 2017). Evidence shows that cravings and aversions are an experience that many pregnant women go through. These, impact their dietary habits and may affect too, their nutritional status evidence shows (Salih et al., 2015). In response to food cravings, the affected women usually consume the craved foods, which are largely unhealthy. The craved foods can include sweet, salty, or spicy foods. Findings from a study conducted among mothers in the USA revealed that 59% of them had experienced cravings (Hainutdzinava et al, 2017). In some cases however women can meet their nutritional needs despite food aversions. Research conducted in Fiji revealed that participants experiencing aversions to particular foods had a higher likelihood of craving foods that met nutritional requirements comparable to those provided by the foods that they were averse to (McKerracher et al., 2016).

Loss of appetite, nausea, and vomiting are other factors that have the potential to influence the eating practices of women who are pregnant (Lennox et al, 2017; Hadil Mohamed Hassan Tahir et al., 2016). In some cases this makes women skip meals with the result that they miss out on the nutrients that the foods could provide. The dietary habits of pregnant women can also be influenced by their attitudes and subjective norms (Luo, 2016).

There is compelling evidence from research showing that socio-demographics have the potential to influence an individual's dietary habits. Gender for example, age, household income, size of household, education level have all been shown to influence an individual's dietary habits. A study conducted among 387 adults in Mauritius showed gender, age, education, and occupation as the most influential factors towards eating practices. Males (21-40 years old) were shown to have a higher consumption of out-of-home lunch while oily foods were frequently consumed by older males (41-60 years old) (Krige S. M et al., 2012). Young people have a higher chance of consuming more energy-dense foods that are low in nutrients than their older counterparts who are more likely to consume more nutrient-dense foods. A study conducted at Reading University in the UK showed that older participants (60+ years) had a higher likelihood of making food choices centred on health considerations while the younger participants (18-30 years old) were not much

concerned with this aspect in their choice of food (Chambers et al., 2008). A research carried out among pregnant women in Ethiopia revealed that family income, husband education, and occupation had a positive relationship with good nutritional practices during pregnancy (Tenaw et al., 2018). The cost of food and an individual's or household's ability to access particular foods is a key determinant choice of food. Low-income groups have been shown to consume unhealthy/unbalance diets and have low fruit and vegetable consumption in comparison with higher income groups. This is because diets whose nutritional quality is less cost less than healthy diets and hence are more accessible by persons of lower socio-economic status in terms of cost (Darmon and Drewnowski, 2015).

However, research shows that higher socioeconomic status does not always lead to a choice of healthy diets but can also lead to a choice of diets that do not promote a good nutritional status. A study that evaluated global consumption of key dietary items reveals that national incomes that are higher are not only associated with the consumption of healthy foods but also the consumption of unhealthy foods (Imamura et al., 2015). Being overweight/obese has an association with an individual's socio-economic, status. Findings from the Kenya National Micronutrient Survey show that women of higher socioeconomic status have a greater possibility of being overweight or obese compared to their poorer counterparts (the Republic of Kenya, 2011). These findings are similar to those of the KDHS which shows women of lower socio-economic status stand a lower possibility of being overweight or obese compared to women of higher socioeconomic status (KDHS, 2014). The KDHS despite covering the entire country did not focus on the nutritional status of pregnant women but rather on women of reproductive age. Further, this survey did not explore the various foods that the women consumed. With such details lacking, the researcher saw the need to conduct this research and document findings from Othaya Constituency.

2.2.4 Role of Dietary Knowledge on Dietary Habits and Nutritional Status

Because there are health outcomes related to diet, knowledge on what ought to be eaten and the reasons why it ought to be eaten is very critical as it would help people to embrace healthy dietary habits. This knowledge is useful in making decisions regarding dietary habits that do not promote people's health. Equipping people with the necessary knowledge on nutrition translates to equipping them with the capacity to question the nutritional status of the food they eat. Knowledge

on nutrition, however, is not always used as a basis for food choice and people's beliefs, attitudes, perceptions about food and even the food choices they make may not be congruent with the nutrition knowledge that they have and therefore not congruent with nutrition values of the food they eat. However, research shows inadequacy of literature on the nature and quality of information and counselling received on maternal nutrition during pregnancy (Kavle, J., & Landry, M., 2017).

A study carried out in Bangladesh involving pregnant and postpartum women found knowledge about the effects of malnutrition in pregnancy, and the quantity and types of food to be consumed during pregnancy inadequate (Salim and Begum, 2015). Results from research carried out among pregnant women in India showed a deficiency of knowledge on anaemia, iron-rich foods, and the importance of iron supplementation during pregnancy (NVidia K et al., 2016). Findings from a study conducted in Marigat Baringo County, Kenya involving 73 lactating mothers showed that, although nutritional knowledge had a positive significant association with nutrition-related attitudes, these attitudes had no significant association with nutrition-related practices (Bartunen, 2013). This study having been conducted on lactating mothers may not be replicated on pregnant mothers whose choice of food may be dependent on other factors. Further Marigat and Othaya do not share the same characteristics and so the findings may not be applicable.

The government of Kenya, through the Food and Nutrition Security Policy 2011, points out the need for nutrition education, promotion of a diet that is more diversified to a package of food products with various macro and micronutrients, as well as the promotion of kitchen gardens at home and rearing of small livestock (Government of Kenya, 2011). It is important that interventions that need to be put in place have been documented in the policy and it would be also necessary to explore and find out how much knowledge pregnant mothers have and if it is affecting their choice of food and thus their nutritional status. This is what the researcher sought to do through this research. Although knowledge does not always stimulate change, it plays an important role when there is a desire for change among people (Barbosa et al. 2016).

2.2.5 Strategies in Addressing Maternal Nutrition

Several interventions can be put in place to address nutrition in pregnant women. They include food fortification, food bio-fortification, vitamin and mineral supplementation, and improved

education and economic status for women. Nutrition education and counselling during pregnancy is yet another strategy and one that WHO also recommends (WHO, 2016). A study carried out to evaluate measures that affecting undernutrition and nutrition-related outcomes for mothers and children revealed that among the interventions were nutrition supplementation, prevention of related diseases, education, and promotion of handwashing. The available interventions, findings revealed, could decrease inter-uterine grown restriction and micronutrient deficiencies by about 25%. Consequently, it was established that micronutrients reduce the risk of LBW (Bhutta et al., 2008). Among nutrition supplements that can be offered to pregnant mothers is iron and folate acid (IFA). Iron/folate supplementation has been shown to enhance Hb levels, and lower the risk of low birth weight (Bhutta et al., 2008). Findings from research on the importance of maternal nutrition strategies revealed that although IFA has limited benefits, these benefits are tangible (Hambidge and Krebs, 2018)

A study that took place in India, using randomized controlled trials where the intervention groups were given nutrition education showed a change of behaviour among those in the intervention group in comparison to those in the control group. Those in the intervention group adopted among other things, a minimum of three meals a day (Daniel et al., 2016). Excessive gestational weight gain is associated with negative pregnancy and birth outcomes. This can however be prevented through diet and exercise. Effects of diet and exercise have been tested through randomized controlled trials with evidence showing that women who received diet and exercise interventions to prevent EGWG have less likelihood of experiencing this condition (WHO, 2016).

In Kenya, efforts have included Sessional Paper No. 4 of 1981, Sessional Paper No. 1 of 1986 on Economic Management for Renewed Growth, and the Kenya Vision 2030 (the Republic of Kenya, 2011). The Constitution of Kenya that is currently in place (2010) takes into recognition food adequacy and nutrition as a human right. In the Kenya National Nutrition Action Plan 2012-2017 (NNAP), the high burden of malnutrition in the country is viewed not only as a threat to achieving Vision 2030 but also a clear sign of inadequate human rights achievement. (Republic of Kenya, National Nutrition Action Plan 2012-2017). Through the National Food and Nutrition Security Policy 2011, the government of Kenya commits itself to address maternal nutrition by putting in place actions that will promote the nutrition of mothers noting that insufficient energy consumption

and micronutrient deficiencies are problems that affect maternal health. The interventions according to the policy would include iron/folate or multi-micronutrient supplementation, promoting diets that are diversified, household-level consumption of fortified food, and nutrition education for pregnant women. To enhance the consumption of fortified food, the government commits to support high-quality commercial micronutrient fortification (Government of Kenya 2011).

However, even though foods, sold over the counter such as maize and wheat flour are labelled, 'fortified with vitamins and minerals, this may just end up being nothing but just labelling according to findings from a survey conducted by the Ministry of Health in six Counties between March-April 2018. The survey revealed that only 28% of the maize and wheat flour on the supermarket shelves, met the stipulated quantities of micronutrients (Standard Digital Thursday 12th July 2018). Studies have established that enhanced food intake and dietary diversity enhance micronutrients intakes (WHO, 1998). It is believed that, of the possible available solutions, dietary diversification is one of the methods that are effective in sustainably addressing nutrition and even avert micronutrient deficiencies (Thompson and Amoroso, 2010).

Although various strategies are recommended in addressing maternal nutrition, there is limited research on the particular strategies that are actually in place and more specifically in the area that the researcher is interested in. Through conducting this research, the researcher seeks to address this gap.

Conclusion on Review of Empirical Literature

The dietary habits of pregnant women cannot be disregarded taking into account that these habits can influence not only the maternal nutritional status but also the birth outcome. Age and other socio-demographic factors for example, parity, and education level have the potential to influence an individual's dietary habits. Socio-economic factors too such as occupation and income, research has shown are capable of influencing an individual's dietary habits and hence their nutrition status. This study, therefore, sought to examine the dietary habits of pregnant women in Othaya constituency, factors that are responsible for these habits, and how the habits influence the nutritional status of the women.

2.3 Theoretical Framework

The theories that guided this research were: Social learning theory (SLT) and Symbolic interactionism theory.

2.3.1 Social Learning Theory (SLT)

Albert Bandura, who came to be known as the father of cognitive theory is the founder of the Social Learning Theory. The theory is grounded on the idea that people learn from interacting with each other in a social context. After observing the behaviour of others in society, people assimilate and imitate the observed behaviour (Nabavi, 2012). Citing Shuel (1986), Nabavi observes that, learning is, "An enduring change in the behaviour or in the capacity to behave in a given fashion, which results from practice or other forms of experience." Based on this view, learning does not begin and end at a certain stage in one's life but it is an ongoing experience. This theory advances the claim that people learn 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 the choice of food is a learned behaviour. (Ko Ester and Mojet, 2006), contend that, in humans, food choice is predominantly a learned behaviour. They observe- learning continues until death. Based on this view, therefore, it means that people can learn new dietary habits and embrace them, they can learn and embrace new diets that have positive effects on their health. Social learning theory according to Carmody et al. (1986), has been used to design and implement health programmes, which are aimed at producing dietary lifestyle change. The theory is used when there is a behavioural-oriented intervention. SLT has been used, for example in several studies to promote heart-healthy diets aimed at reducing plasma-cholesterol levels (Carmody et al., 1986). Mayer and Gast, (2008) using the social learning theory

in research involving girls aged 10-12 years, found a positive correlation between peer influence and eating disorder thus supporting the view that we learn eating behaviour from people whom we interact with. Nicklaus (2004), using French children in a longitudinal study investigated the correlation of food preference at age 2 and 22. The findings showed a strong link between childhood and adult food preferences for about 50% of dietary items, there was a strong indication between childhood and adult food preferences. This showed that children learn new things along the way. The theory, however, has a weakness in that although people may learn from one another including children who learn from their close family members, they do not necessarily adopt everything that they learn. People are independent and therefore can make personal decisions on what they think is suitable for them.

2.3.2 Symbolic Interaction Theory

People develop symbolic meaning and rely on this in their social interactions. The Symbolic interaction theory also known as symbolic interactionism is based on this premise. According to this perspective, people, through their interactions with others, learn to interpret and give meaning to the world. These attached meanings are subjective. Symbolic interaction theory thus, analyses society according to the subjective meanings that people attach to behaviour, objects, and events. According to this perspective, people's behaviour is based on the beliefs they hold rather than that, which is objectively true. Herbert Blumer a student of John Herbert Mead coined the term symbolic interactionism and outlined the basic principles. According to Blumer (1969), the ascribed meaning of things comes from the interactions we have with other people in society. If one, for example, likes tea, a proponent of symbolic interaction theory might propose that the person learned from someone that tea is good. Some social-cultural norms prescribe what people should eat and restrict them from eating certain foods.

The theory is suitable for use in this research as the research explores the meaning people attach to food. Symbolic interaction theory has been used by Bakar (2014) to explain consumer behaviour among Muslims. Gillespie and Johnson, (2009) using this theory, found that most food-eating discussions are routine and evolve. The authors also found that the family food decision-making system comprises interactions among family members as well as their inclination on food items. Oniang'o and Komoti (1999), citing (Were et al., 1986), observe that among the Embu community

of Kenya, pregnant women were not allowed to include beans in the food that they ate. This is because it was believed that beans caused constipation and therefore the women would experience discomfort. In Western Kenya, Oniang'o and Komoti (1999) observe, some ethnic groups prohibit pregnant women from eating eggs with the reasoning that if they and children were permitted to eat this food item, chickens were going to get finished. Such people may continue in life holding those views, therefore, avoiding those foods and passing on the information to the younger generation as they interact. They will have attached meanings to these food items. Pick and Sirkin (2010) contend that, norms are incorporated within a culture's larger system of shared symbols. These are learned and passed through generations consistently and they influence how people perceive the world and interact with each other. One of the weaknesses of this theory is that symbols may be misinterpreted or interpreted differently by different people and therefore have different meanings to different people or in some cases get completely misunderstood.

2.4 Conceptual Framework

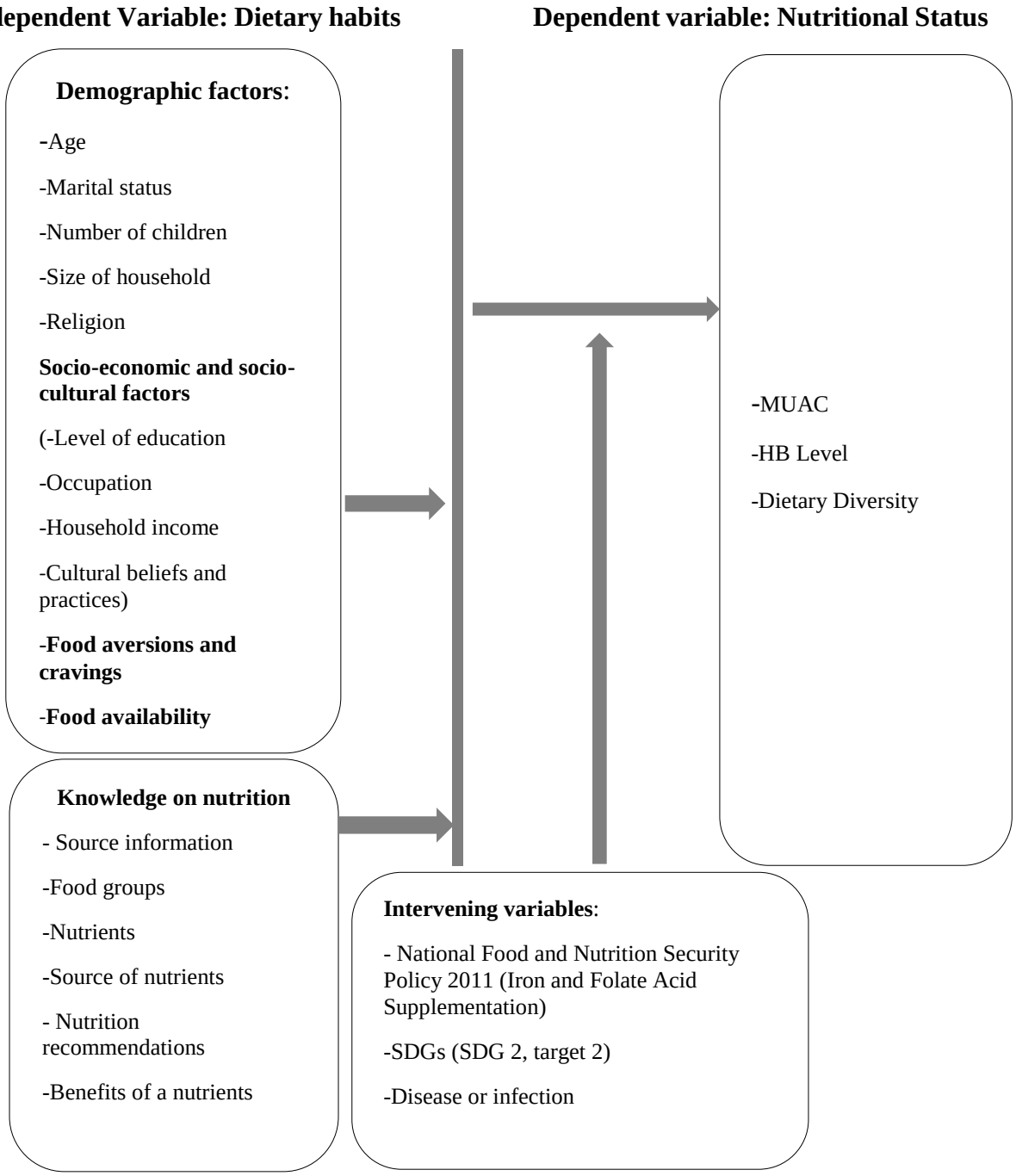


Figure 2.1: Conceptual framework

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter presents details of the methods applied in the research, site selection, the population targeted, how sampling was done, the instruments used to collect data, and how data were collected and analysed.

3.2 Study Design

This research used a descriptive, cross-sectional survey design which employed a mixed-method approach. The descriptive approach helped collect information on the participants' attitudes, opinions, and habits. In a cross-sectional survey, the researcher observes the study case(s) in a single instance as he/she records the facts concerning the study variable and does not require the researcher to conduct a follow-up of study participants or phenomena of interest. This method aids the researcher in collecting reliable data that can be used to conclude. There is an additional benefit in that the method assists in the collection of data within a short period of time, therefore, lowering the cost. The study made use of interview guides, which were interviewer-administered and FGD to gather data from pregnant women. In-depth interviews were used for key informants.

3.2.1 Study Area

Othaya Constituency, Nyeri County, Kenya was the study area for this research. Othaya constituency is one of the six electoral constituencies in the County and is located in Nyeri South Sub-County, one of the County's eight Sub-Counties. Othaya has an estimated area of 174.7sq km with an estimated population density of 197 (persons/Km2). The Constituency has four electoral Wards in total namely; Karima, Iriaini, Mahiga, and Chinga. In 2018, the Constituency's estimated population was 104,600 (52,122 male and 52,478 female) with women of reproductive age estimated at 26,826. Members of the Kikuyu ethnic community are predominantly the inhabitants of this Constituency. Available evidence shows that agriculture is the Constituency's main economic activity with coffee and tea as the main cash crops. Dairy farming is also one of the major economic activities (the Republic of Kenya, 2018, The National Government Constituencies Development Fund, 2019). Othaya was purposively selected on the basis that, there is limited research that has been carried out on dietary habits of pregnant women from this area and

especially the contribution of these habits on women's nutritional status. A map of Othaya Constituency is in appendix I.

3.2.2 Specific Study Sites

This research was carried out in four health facilities located in Othaya Constituency. These facilities are; Gichiche in Chinga Ward, Othaya Sub-County Hospital in Iriani Ward, Witima Health Centre in Karima Ward, and Kamoko Health Centre in Mahiga Ward.

3.2.3 Target Population

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 their current pregnancy. These were required to have met the inclusion criteria and sign an informed consent form after accepting to take part in the research. The research targeted 119 women for the interviewer-administered one-on-one interviews. Another set of women participated in the study through focus group discussions. These women were required to meet the age criteria of 18 years and above. However, the number of ANC visits made was not a selection criterion for them, since their nutritional status was not assessed.

One of the FGDs consisted of 8 participants while the other one had 10 participants and because a total of 2 FGDs were conducted there was a total of 18 women participating in the FGDs. One FGD was conducted at Othaya Sub-County Hospital in Iriaini Ward while the second was conducted at Gichiche Health Centre in Chinga Ward. The selection of these two as FGD sites was informed by the fact that the facilities had a higher ANC client-load compared to the remaining two. The researcher chose to focus on pregnant women because of the potentially damaging effects of poor nutritional status on their health and that of their unborn children. Specifically, the researcher chose to concentrate on women making their first ANC visit because it is expected that they would not have been put on nutrition supplementation hence only the food they ate would have affected their nutritional status. Health workers were also included in the research. Specifically, the County and Sub-County Reproductive Health Coordinators, the County Nutritionist, Sub-County Nutritionist, and health workers in charge at each of the health facilities where data were collected.

3.2.4 Inclusion and Exclusion Criteria

3.2.4.1 Inclusion Criteria

All pregnant mothers seeking ANC services for the first time during their current pregnancy in any of the four target health facilities were aged 18 years and above did not have a chronic illness and consent to be included in the study. For the focus group discussion, the inclusion criteria will be all pregnant women seeking ANC services at any of the four health facilities and are aged 18 years and above. Additionally, the County and Sub-County Reproductive Health Coordinator, County and Sub-County Nutrition Coordinator, and health workers in charge at each of the four health facilities will be included in this research and will be interviewed as key informants.

3.2.4.2 Exclusion Criteria

Women who did not give their consent and women under the age of 18 years were excluded from this research. Women who had made more than one ANC visit were also excluded from participating in interviewer-administered interviews and could only participate in the focus group discussion. 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 contributing to their nutritional status. The other group of women who were excluded from the study is those who had chronic conditions like HIV, tuberculosis, and diabetes as these conditions have the potential to compromise their nutritional status.

3.3 Sampling and Sampling Procedure

3.3.1 Sample Size Calculation

Purposive sampling was used in this research and the study sample was drawn from 4 health facilities spread across the four electoral Wards of Othaya Constituency. Statistics obtained from target research sites showed that ANC services are ongoing with each of the sites serving new as well as revisiting ANC clients every month. Owing to resource constraints the researcher chose to use data on new ANC clients reported for a period of six months in the constituency in 2018. The size of the sample, therefore, was determined based on the number of new ANC clients reported in the Constituency during the period July to December; 2018. This data was used because it was the most recent and was obtained from the KHIS database and because it was obtained from the KHIS database, it was therefore valid. Data for the referenced period shows that during these six

months, (July-December, 2018), a total of 898 new ANC clients were reported in the entire Constituency. The sample size was therefore calculated based on the total, 898.

In order to establish the exact sample size for this research, the calculation was be done using Fisher's formulae. According to Mugenda and Mugenda, (2003); when the population is less than 10,000, a sample size of between 10% and 30% is a good representation of the target population.

$$n = \frac{N}{1 + N(e)^2}$$

Where *n* = Sample Size

N= Population Size

e=Level of precision

Therefore using the (July-December, 2018) total of 898 new ANC clients and substituting we get

$$n = \frac{898}{1 + 898(0.09)^2}$$

$$\cong 108$$

Adding 10% non-response then (108+11) ≅ 119

The table below shows how new ANC participants were distributed by Ward in the period July-December, 2018 as reported in KHIS.

Table 3.1: Distribution of new ANC clients across the electoral Wards, July-December 2018

Name of Ward	Number of New ANC clients July – December 2018	% Ward contribution to new ANC clients July-December 2018
Chinga	188	21
Iriaini	462	51.4
Karima	74	8.2
Mahiga	174	19.4
Constituency Total	898	100

Data source: KIHS

The 119 cases arrived at were then distributed proportionately across the four health facilities with the facility which had reported the highest number of new ANC clients during the period July-December 2018 being allocated the highest number of participants.
The table below shows how the respondents were be distributed across the 4 health facilities.

Table 3.2: Distribution of Respondents by Health Facility

Name of Health Facility	Number of New ANC clients July-December, 2018	% Contribution to Ward Total July-December 2018	% Contribution Constituency Total July-December 2018	Number of participants targeted for study
Gichiche Health Centre	105	55.8		24
Othaya Sub-County Hospital	402	87		61
Witima Health Centre	56	75.6		10
Kamoko Health Centre	90	51.7		23
	653		**72.7**	**119**

Data Source: KHIS

To better understand the interventions that are in place to address dietary habits among pregnant women with the view of improving their nutritional status key informants were included in the study. Specifically, the County and Sub-County RH Coordinators and the County and Sub-County Nutritionists were interviewed. At each of the health facilities, the health worker in charge was also interviewed. There was, therefore, a total of 8 key informants who were interviewed in this study. These 8 health workers were selected as Key Informants owing to the positions they occupy. Owing to this, they perform a critical role in maternal nutrition thus, they more than other health workers, would hold information that would be useful and relevant to this study.

3.3.2 Sampling Procedure

Othaya Constituency was purposively selected because limited research on the topic of interest has been conducted there. Purposive sampling was used in the selection of the 4 health facilities. This was based on the fact that available data shows that the four contribute the highest number of new ANC visits. Research participants were purposively selected every woman who fulfilled the eligibility requirements and consented was enrolled in the study until the sample size was arrived

at. Screening of potential study participants was done by the health workers providing the services, who had been informed of the selection criteria. The health workers then referred the potential participant to the interviewer who will do further screening by reconfirming the age and number of ANC visits made. This was done to ascertain eligibility for inclusion in the study.

3.3.3 Recruitment and Consenting

Recruitment of study participants took place at the ANC clinic in each of the four health facilities. The health workers offering ANC services had been informed of the study and the inclusion criteria were well explained to them. After the health worker had provided the services he/she would check to see if the client was eligible for inclusion. If eligible, the health worker then referred her to the interviewer. In collaboration with the administration of the health facility, a private room/space was provided where the interviewer sat with the client, sought consent, then, conducted the interview. This was meant to guarantee privacy for the study participants. The interviewer sought to confirm that the woman is eligible for inclusion by confirming her age and the number of times she had sought ANC services during her current pregnancy. The interviewer explained the study to the potential participant, then sought her consent after she has been given all the information and all the questions if any addressed. Written consent was sought and was a requirement for every participant. Participants received a copy of the consent form for reference and to also provide contacts of the relevant person and the Ethics and Research Committee if they ever wanted to communicate seeking further information about the research.

Individual consent was sought from every woman who participated in the focus group discussion.

3.3.4 Variables

For this study, the dependent variable was nutritional status while the independent variable was dietary habits.

3.4 Data Collection

The researcher and three research assistants were engaged in this process of data collection. They received training on the study objectives and data collection, including the data collection tools. They were, in addition, trained on research ethics a critical requirement for those who collected data in this research. During the period of data collection, the research assistants were available.

3.4.1 Sources of Data

In this research, both primary and secondary data were collected. Primary data were gathered through interviewing the study participants and Key informants while secondary data were collected from hospital records, mainly the ANC register and the Maternal and Child Health booklet.

3.4.2 Data Collection Methods

Women who were pregnant and satisfied the requirements of the research were recruited at the health facility after receiving their ANC services and informed consent was sought before any interview was conducted. Semi-structured interviews where all the respondents were subjected to the same set of questions were used to collect data from 119 women. These interviews were ad mistered to the research participants at the health facility and the privacy of the participant was a major consideration.

Interview guides, containing questions tailored to help gather the relevant information and thus gain an understanding of the general community's views on the research topic, were used to gather data through focus group discussions. One of the FGDs consisted of 8 participants while the other one consisted of 10 participants. There was a moderator who guided the discussion and a note-taker who recorded the responses. In addition, and to help capture all the responses there was be an audio recording of the discussions, and consent to record the discussions was sought from the participants before the recording took place. In-depth interviews with the key informants who included County and Sub-County Reproductive Health Coordinators, County and Sub-County Nutritionist and the health worker in charge at each of the four target health facilities and these will be done either in their office, at the health facility, or their place of choice.

To understand the women's dietary intake, a dietary diversity questionnaire was administered. The dietary diversity questions involved a 24-hour recall where the respondent was asked to name as well as describe every food item she had consumed in the preceding 24 hours. Thorough probing was done to ensure that the respondent named all the foods she had consumed in and outside the home within the 24 hours. Using the information collected, the Women's Dietary Diversity Score (WDDS) based on nine food groups, was calculated following the FAO guidelines (FAO, 2010).

MUAC measures were taken using an adult MUAC tape and MUAC of less than 23.0 cm was considered low. Hb tests were done by qualified laboratory technicians and the readings were documented in the maternal and child health booklet after which this data was then transferred to the ANC register. In this research, an Hb level below 11g/dl was be considered low. This is in line with WHO standards (World Health Organization; 2017)

3.4.3 Data Processing and Analysis

Quantitative data were collected using a Mobile Application after which it was uploaded into an online platform where data were stored. The data were then exported to Statistical Package for the Social Sciences (SPSS) the software that was then used for analysis. Descriptive statistics were used to show the characteristics of study participants. To help establish the relationship between respondents' demographic factors such as (age, marital status, and household size), economic factors such as (household income and occupation), cultural factors, and dietary habits a chi-square test was done. Focus group discussions were used to collect qualitative data. The discussions were audio-recorded and notes of the discussions were taken to provide backup to the recording. The discussions were then transcribed and translated to English, which were analysed by thematic areas and has been used to triangulate the quantitative data.

3.5 Ethical Considerations

For this research, ethical approval was sought from KNH-UoN Ethics and Research committee by submitting copies of the research proposal and the data collection tools for review. Approval was also sought from the Department of Sociology and Social Work of the University of Nairobi. Further, approval was also sought from the County government of Nyeri, Department of Health, which runs the health facilities, from the MOH, Nyeri South, and the health workers in charge of the respective health facilities. Approval for this study was also sought from NACOSTI.

To help ensure that service provision at the health facilities was not interfered with, and the health workers were not inconvenienced, data collection took place during the regular working hours. The interviewers worked for hand in hand with the health workers offering services to help recruit eligible participants. Eligible participants were approached for inclusion into the study only after they have received services, were referred to the health worker to the interviewer and only those

who consented were being included. To maintain the privacy of the study participants the interviewers worked with the facility administration and staff at the MCH clinic to get a private room/space from where interviews were conducted. Confidentiality was strictly adhered to and research assistants were be required to have undergone research ethics training. Names of study participants were not recorded and instead participants were identified using unique codes. Caution was taken in the storage of data and only the research team was able to access the data. Data that was in paper form was submitted to the principal investigator who ensured safe-keeping. Processed data were stored in a computer that was password protected.

3.5.1 Study Results and Dissemination Plan

Findings from this research were compiled into a report, which was deposited in the University of Nairobi Digital Repository for access to those who would want to read it. Articles will be written from the findings and published in academic journals to further help disseminate the study results

3.5.2 Minimization of Errors and Biases

The data collection tool was pre-tested for accuracy before data collection commenced. There was a Kiswahili translation of the data collection tools for the sake of participants who did not understand English. To ensure that they gained an understanding of the study, the research assistants were trained on data collection, the study and its objectives. Training on the use of the mobile phone application was also done to ensure that they gained an understanding data collection system.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, AND INTERPRETATION

4.1 Introduction

In this chapter research findings following the objectives of the study, are presented. The chapter also presents an interpretation of the findings. The study targeted 119 pregnant women seeking ANC services in Othaya Constituency. Another group of pregnant women was targeted for inclusion in the study through focus group discussions. It was expected that there would be a maximum of 20 pregnant women participating in the focus group discussions with each of the FGDs consisting of a maximum of 10 participants. One of the FGDs has 8 women participating while the other had 10 participants thus making a total of 18 women from whom data were collected using this technique. Also targeted and included in the study, were key informants among them the County Nutritionist, the County Reproductive Health Coordinator, the Sub-County Nutritionist, the Sub-County Reproductive Health Coordinator, and all the health care workers in charge of the four target facilities. A total of 8 key informants were interviewed.

This study was aimed at establishing the nutritional status of pregnant women to assess the nutritional status of pregnant women in Othaya Constituency making their first ANC visit during their current pregnancy, to establish the dietary habits of pregnant women in Othaya Constituency, to determine the factors influencing dietary habits among pregnant women in Othaya Constituency, to examine the role of dietary knowledge on the dietary habits and nutritional status of pregnant women Othaya Constituency making their first ANC visit during their current pregnancy, to identify and document existing strategies which address the dietary habits and nutritional status of pregnant women in the Constituency.

4.2 Respondents' Socio-demographic Characteristics

4.2.1 Demographical Background Information

A total of 119 pregnant women participated in the study, translating to a 100% response rate.

4.2.2 Age of the Respondents

As displayed in the table below, most of the study participants (44%) were in the age bracket of 18-24, those within the age bracket of 25-29 (18%) followed coming a distant second. Within the age category of 40+ years, there was only 7% of the study participants.

Table 4.1: Age of Respondents

The age group of Respondents	Frequency	Percentage
< 20	7	6%
20 - 24	46	38%
25 - 29	21	18%
30 - 34	25	21%
35 - 39	13	11%
40+	7	6%
Total	**119**	**100%**

Source: Researcher

4.2.3 Respondents' Marital Status

More than 70% of the study participants were married in a monogamous union with only 2% married in a polygamous union. Out of the 119 participants, 19% were single and had never been married and 2% were separated while 1% of the participants were widowed.

Table 4.2: Respondents' Marital Status

Marital Status	Frequency	Percentage
Married monogamous	91	76%
Married polygamous	2	2%
Single (Never married)	23	19%
Separated	2	2%
Widowed	1	1%
Total	119	100

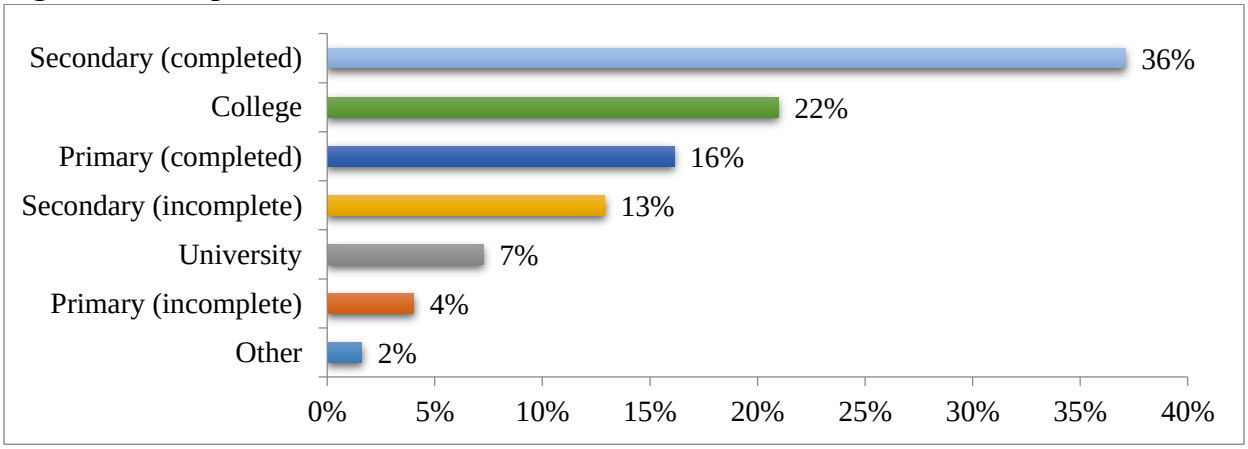
Source: Researcher

4.2.3 Education Level of Respondents

Maternal education is, according to research findings, one of the contributing factors to maternal health knowledge (Perumal et al., 2013). In this study as indicated in the table below, 58% of the

study participants were educated up to either secondary or college level (36% had completed secondary education and 22% had completed college) and 6% had completed university education.

Figure 4.1: Respondent's Level of Education



Source: Researcher

4.2.4 Religion of the Respondents

All the pregnant women participating in this study were Christians; (52% Protestant and 30% Catholic, and 18% Pentecostal), as displayed in the table below. Religious bodies have their own set of rules and restrictions, some of which relate to eating habits.

Table 4.3: Respondent's religion

Religion of Respondents	Frequency	Percentages
Christian (Catholic)	36	30%
Christian (Protestant)	62	52%
Christian (Pentecostal)	21	18%
Total	**119**	**100%**

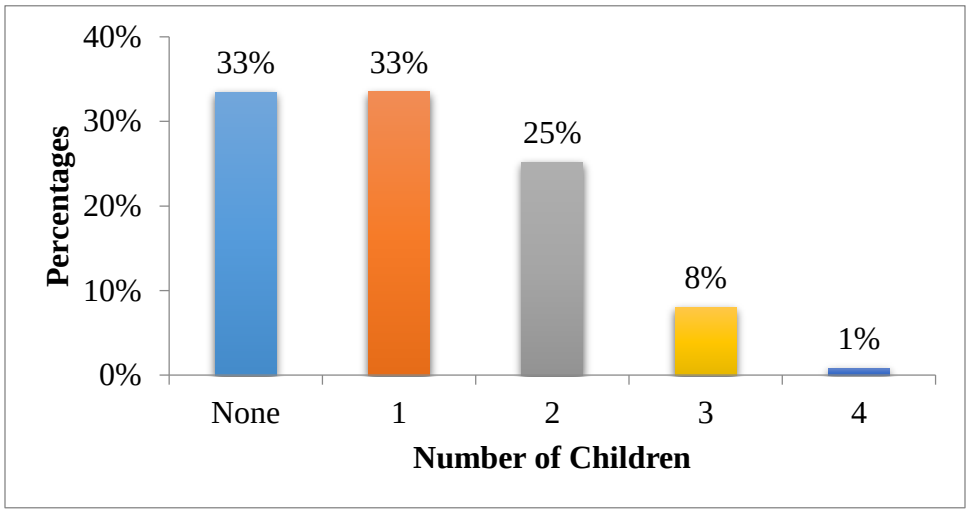
Source: Researcher

4.2.5 Number of Children Given Birth to

Findings for this research showed that 33% of the women did not have any previous births, 33% of the respondents had given birth to one child while 25% had given birth to 2 children with only 1% having given birth to 4 children. Available literature has revealed a positive correlation between the number of children a woman has given birth to and food consumption. In Sweden,

findings from a study conducted among pregnant women revealed a positive association between the number of children given birth to and consumption of certain food (Stavik et al., 2019).

Figure 4.2: Number of Children given birth to



Source: Researcher

4.2.6 Respondent's Occupation

Findings from this study showed that 18% of the study participants were involved in trading/business, 16% were salaried while 9% of the women were casual labourers. Thirty, (25%) of the respondents were housewives. Occupation according to available literature has been shown to affect the choice of food. In this study, as will be demonstrated later, in this report, the occupation of pregnant women was shown to have a significant relationship with their dietary habits.

Table 4.4: Respondent's Occupation

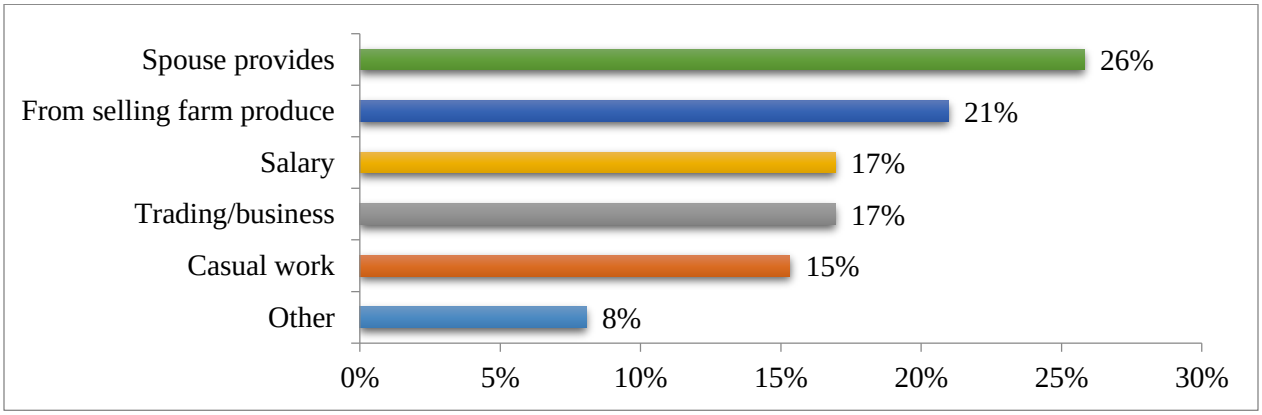
Respondent's Occupation	Frequency	Percentages
Housewife	30	25%
Trading/business	21	18%
Works in own farm	26	22%
Casual labourer	11	9%
Salaried worker	19	16%
Other[s]	12	10%
Total	**119**	**100%**

A student / dependent on the parent. Source: Researcher

4.2.7 Respondent's Main Source of Income

For a source of income, findings from this study revealed 70% of the women depended on their own (21% from selling farm produce, 17% from salary, 17% from trading/business, and 15% from casual work). 26% of the respondents depended on their spouse for provision.

Figure 4.3: Respondent's Main Source of Income



Source: Researcher

4.2.8 Education Level of Respondents' Husbands

Participants who were married were asked about the highest level of education that their husbands had achieved. The table below presents the findings revealing that 34% of the husbands had completed secondary school, 28% had completed college education with only 2% had not completed any level of education. Available literature shows a significant relationship between a husband's income and maternal dietary habits (Nana A., Zema T., 2018). There was no relationship seen between the women's dietary habits and the education of their husbands.

Table 4.5: Husband's education level

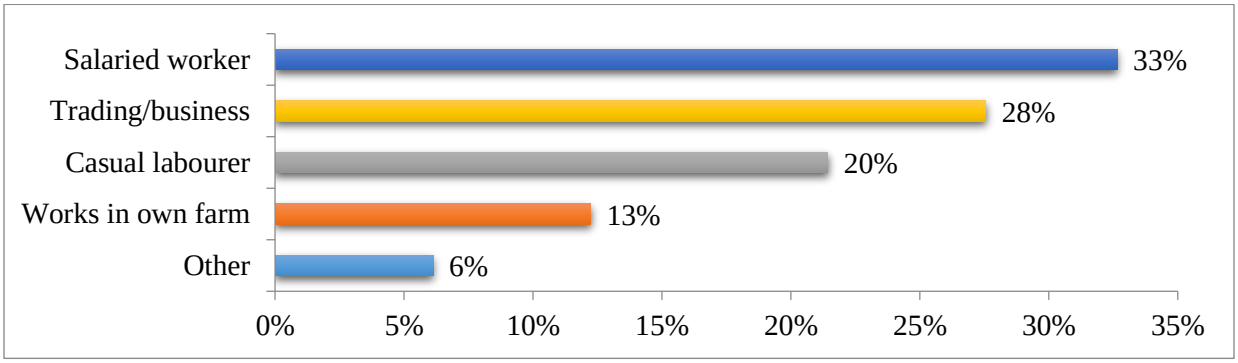
Level of husband's Education	Frequency	Percentages
Primary (incomplete)	2	2%
Primary (completed)	12	13%
Secondary (incomplete)	9	10%
Secondary (completed)	32	34%
College	26	28%
University	9	10%
Other	3	3%
Total	**93**	**100%**

Source: Researcher

4.2.9 Husband's Occupation

As for husband's occupation, 33% of them were salaried workers, 28% were involved in trading/business and 13% worked in their own farms/land. A study conducted among pregnant revealed that the occupation of the husband was among the factors that had a positive relationship with good nutritional habits for the duration of pregnancy (Tenaw et al., 2018).

Figure 4.4: Husband's Occupation (n=93)



Source: Researcher

4.3 Objective i: Nutritional Status of Pregnant Women

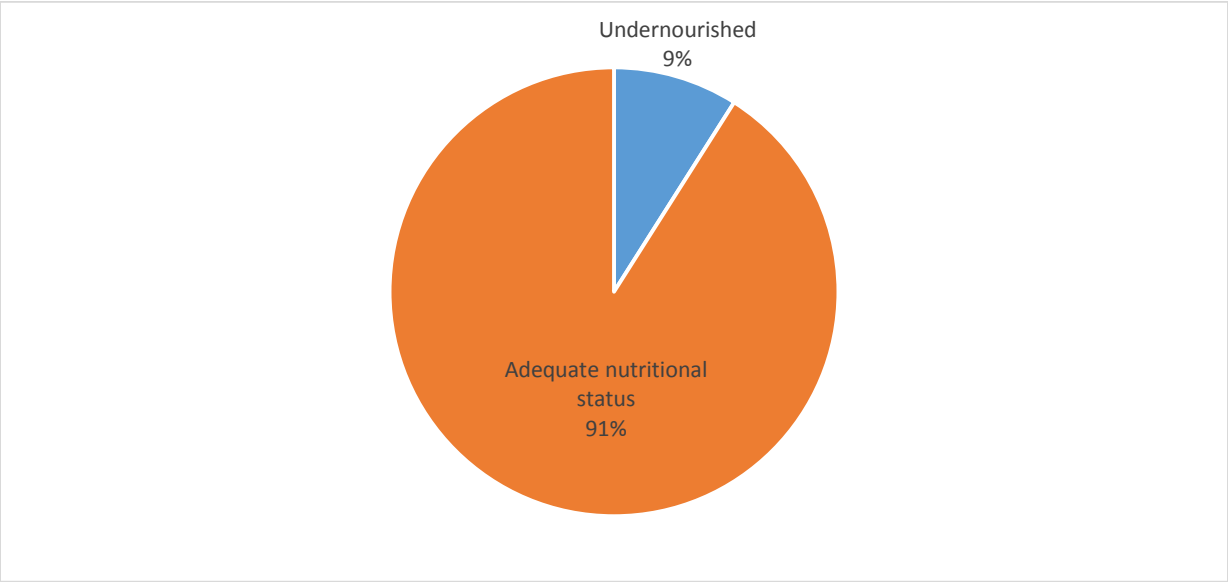
To assess the nutritional status of pregnant women, the study used MUAC, which is an anthropometric method, haemoglobin (Hb) level, and dietary diversity, a qualitative measure of food intake which is a proxy for nutrient sufficiency of the diet of individuals.

4.3.1 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. Only 9% of pregnant women seeking ANC services in Othaya Constituency, according to findings of this research, 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 S and Sen J., 2018). There was, therefore in light of this, 9% of the study participants who were at risk of adverse birth outcomes.

Figure 4.5: Nutritional status by MUAC measurement

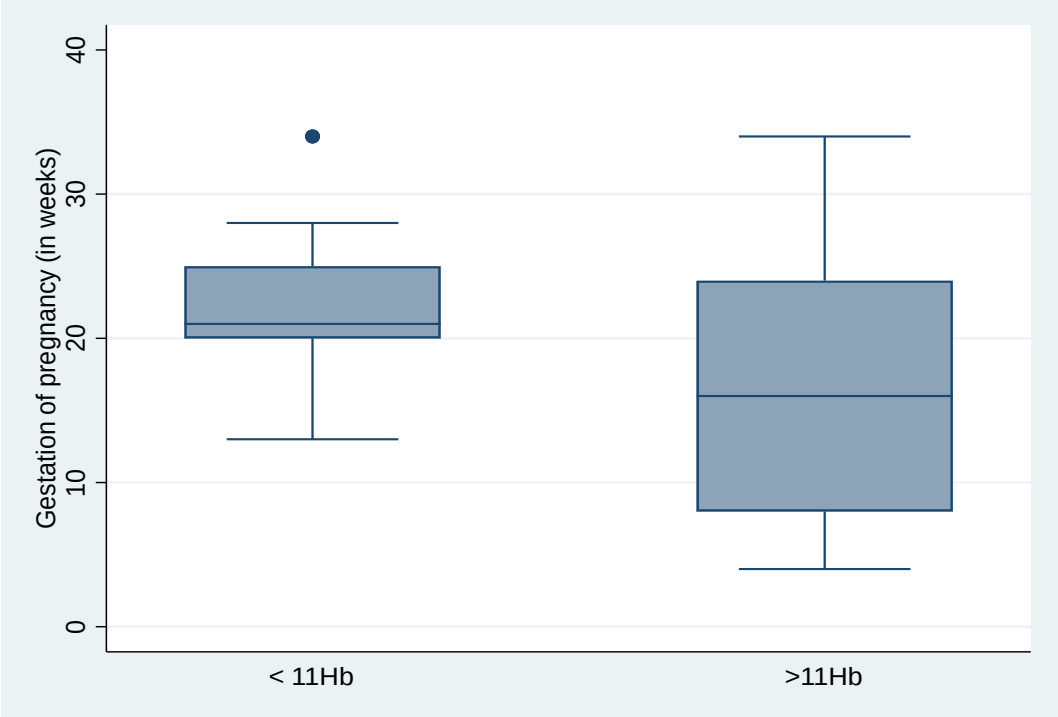


Source: Researcher

4.3.2 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 4.6: Hb Levels by gestation period



Source: Researcher

Table 4.6: 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

Source: Researcher

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.*

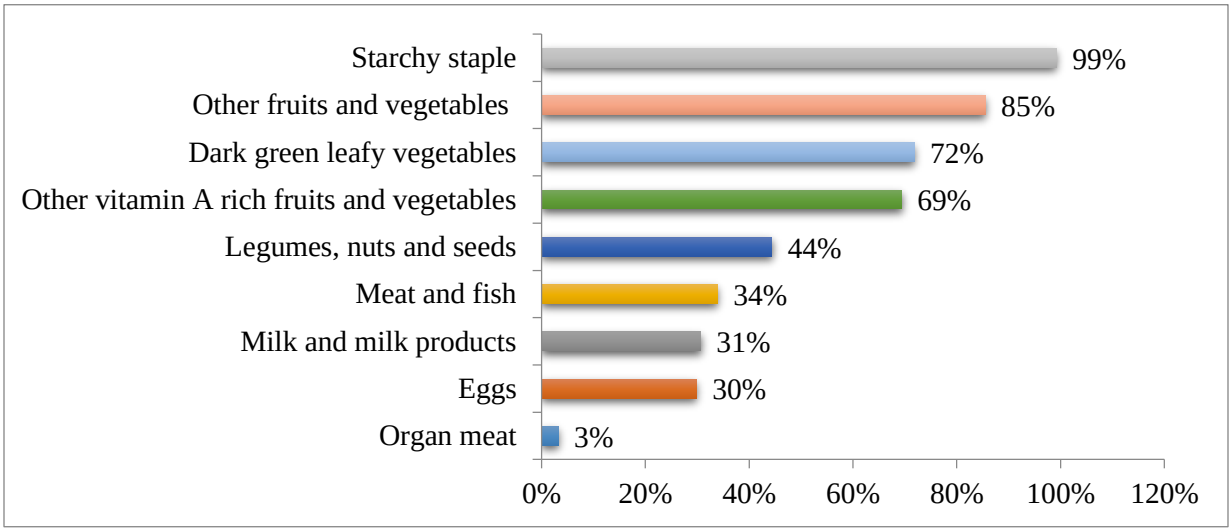
A female key informant at the Sub-County level reported the following concerning the nutritional status of pregnant women in the Constituency:

> *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.*

4.3.3 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 4.7: Respondents' consumption of the nine food groups the day preceding the interview

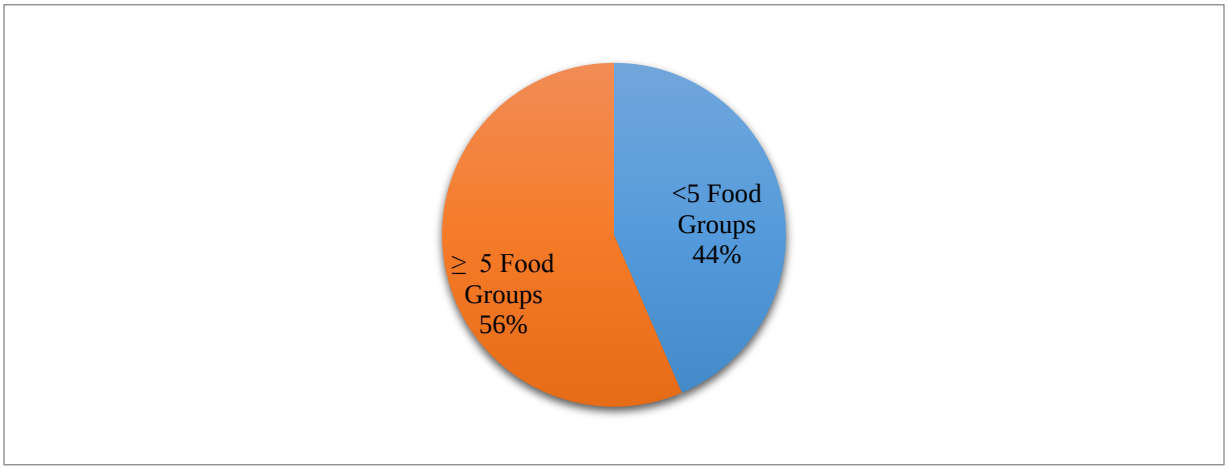


Source: Researcher

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 4.8: Participants' categorization by number of food groups consumed



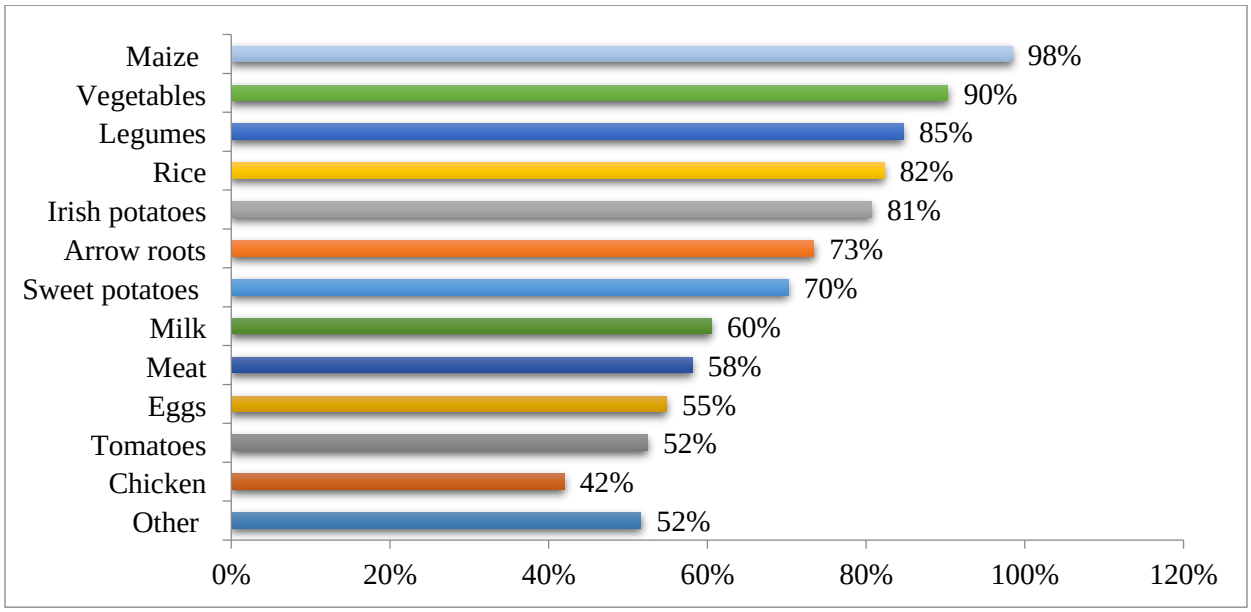
Source: Researcher

4.4 Objective ii: Dietary Habits of Pregnant Women

4.4.1 Foods Available Locally

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 4.9 and figure 4.10 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.

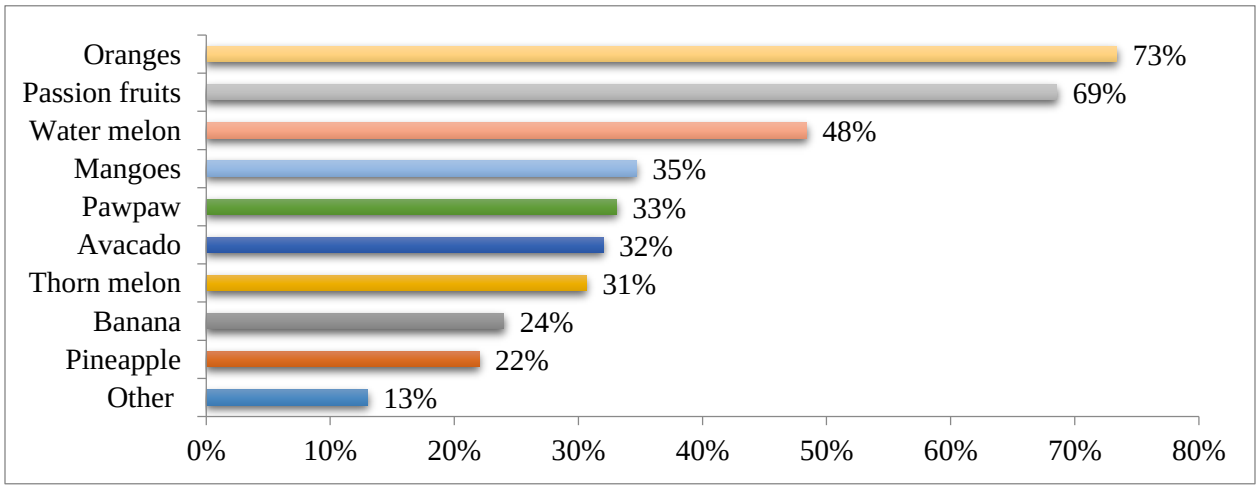
Figure 4.9: Foods available locally



Source: Researcher

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

Figure 4.10: Fruits available locally



Source: Researcher

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 4.7: 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 allowed

Source: Researcher

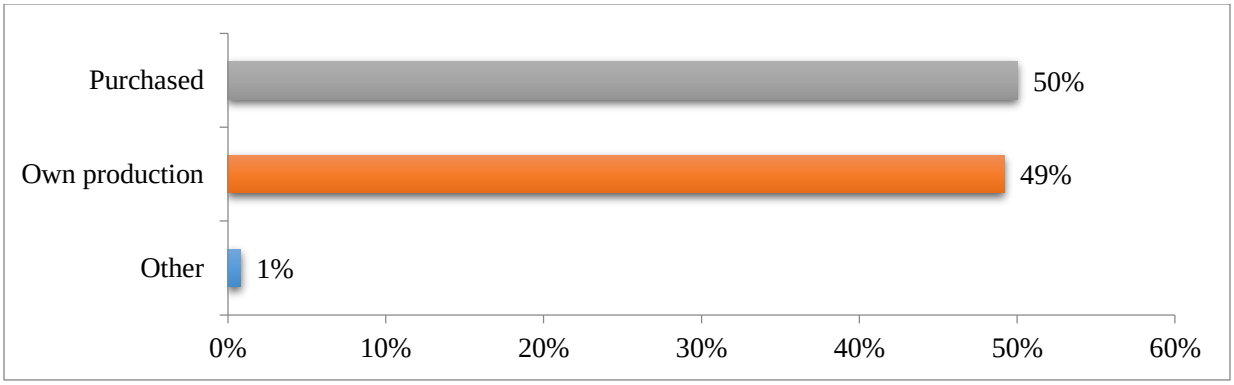
Asked if they have land on which they grow food crops, a total of eighty-eight (88) respondents reported that they did own land where they grew food crops. All the respondents were asked what their main source of food was. Half (50%) of them reported that the food they eat was purchased while 49% said 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 crop*s.

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 4.11: The main source of food eaten



Source: Researcher

4.4.2 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 4.8: 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%**

Source: Researcher

4.4.3 Which Foods Do You Eat More Regularly?

Asked which food they ate more regularly, 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.

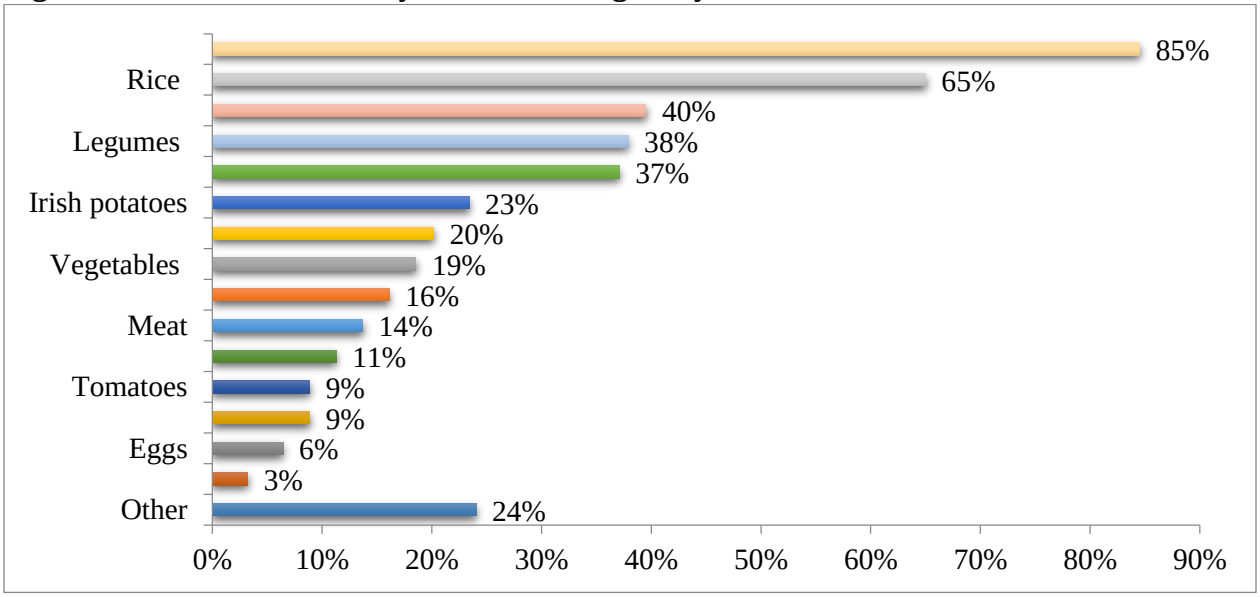
> ***Res:*** *These people consume a lot of starch.*
> ***Int:*** *Which are some of the foods?*

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.*

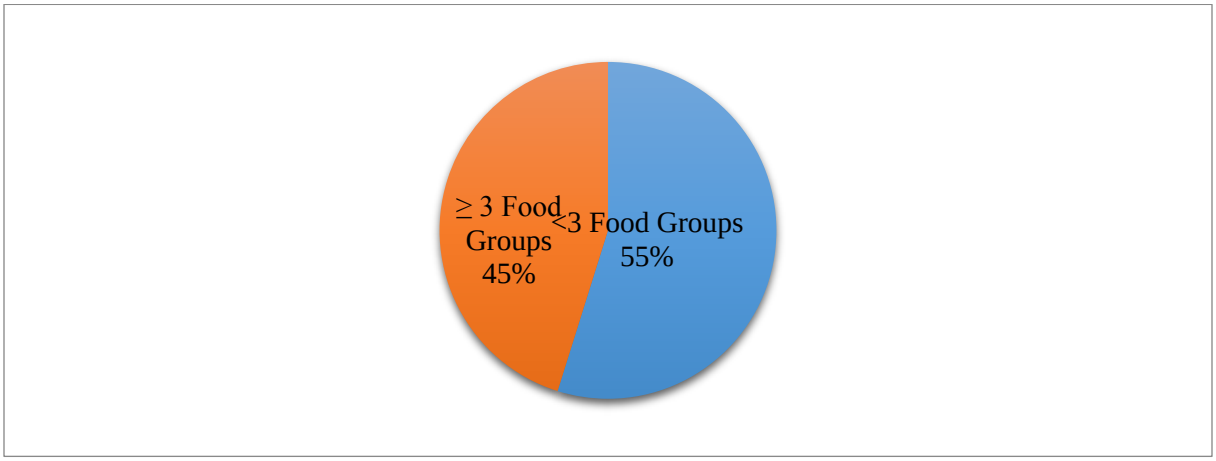
Figure 4.12: Which foods do you eat more regularly?



Source: Researcher

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.

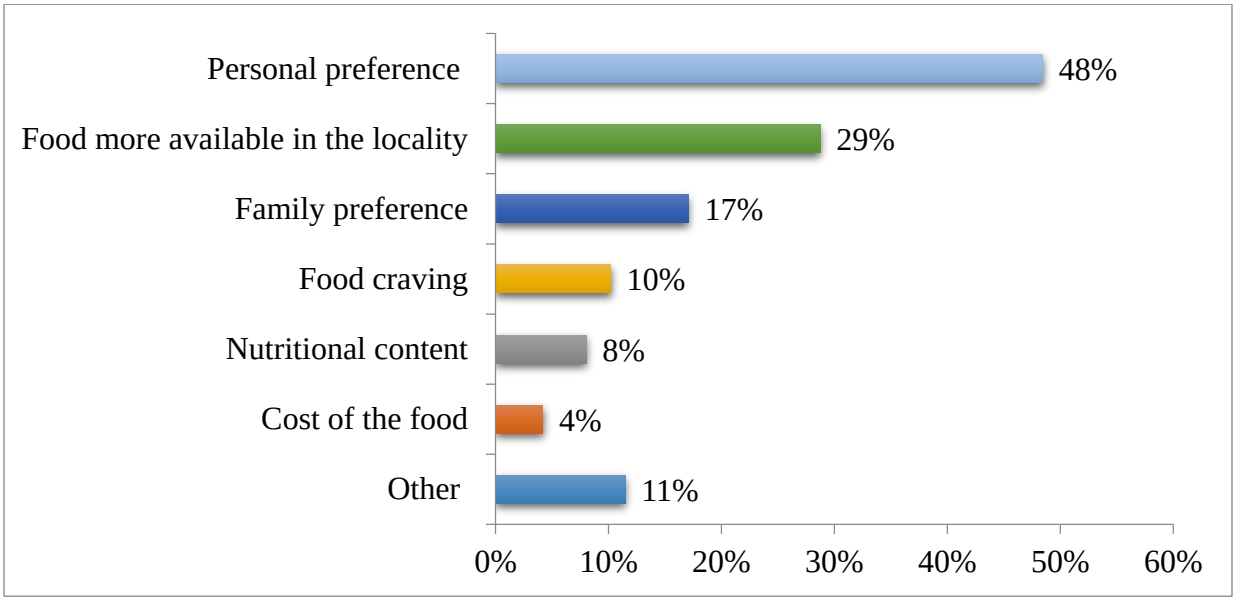
Figure 4.13: Respondents food consumption by food group



Source: Researcher

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 4.14: Reasons for choice of food



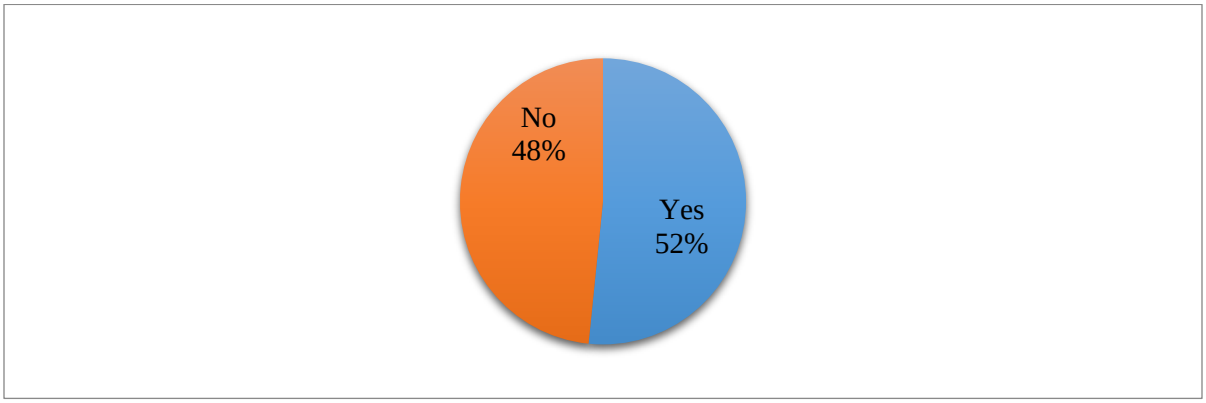
Source: Researcher

4.4.4 Are There Some Foods that you would like to Eat More Regularly but You Don't?

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 4.15: Respondents response to whether there are certain foods they would want to eat more regularly but they don't



Source: Researcher

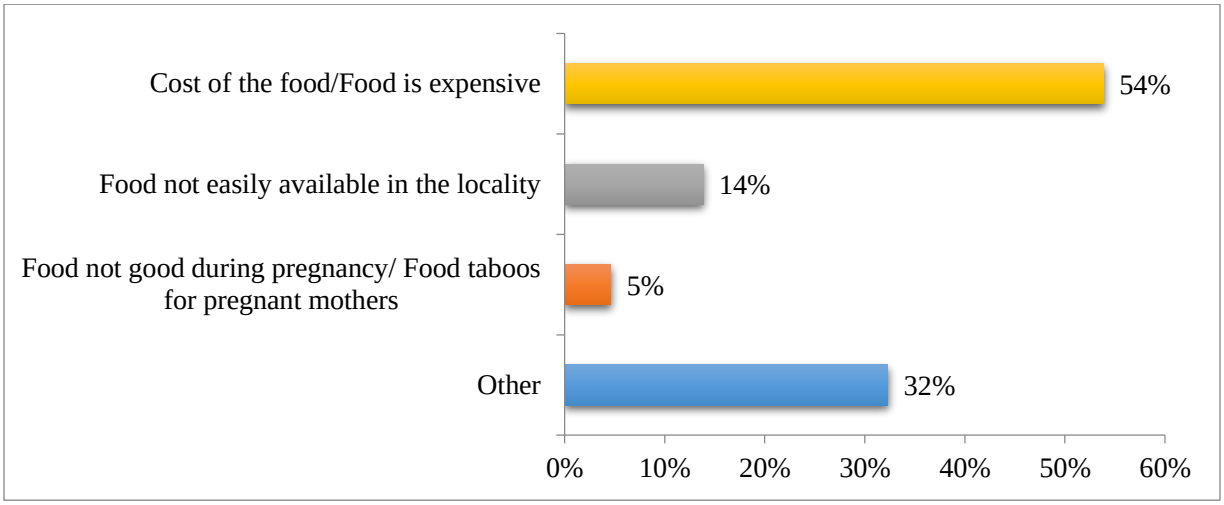
4.4.5 Foods that Respondents would have Wanted to Eat More Often

One of the questions that the participants were asked was the specific foods that they would have wanted to eat more often but could not. To this, 21% of them mentioned meat as the food that they would have preferred to eat more often with the remaining mentioning other foods like rice and fruits. Maize was not among the foods mentioned with *ugali* being mentioned by only one respondent.

4.4.6 Reasons for Respondents Not Eating the Foods as often as they wanted

The respondents were, in addition, asked the reasons as to why they did not eat the foods as often as they wanted. Out of those who said that there were specific foods that they would have wanted to eat more often, 54% of them said that it was because the cost of the food/food was too expensive. This is displayed in the figure below.

Figure 4.16: Respondents' reasons for not eating the foods as often as they wanted



Source: Researcher

The key informants were asked which barriers there were in pregnant women consuming a diet that was adequate to meet their nutritional requirements. Below are some of the issues they mentioned.

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.*

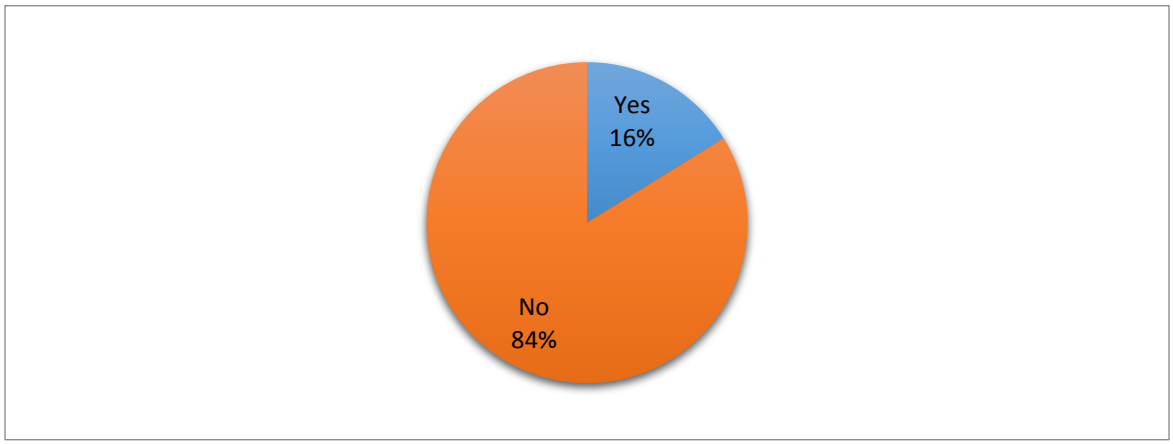
Below are the views of a male clinician in charge of one of the health facilities:

> ***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.*

4.4.7 Food Restrictions/Taboos

As to whether people in the community discouraged pregnant women from eating certain foods, 84% of the study participants said that they did not with the remaining 16% of the participants said that they did as shown in the table below.

Figure 4.17: Do people in your community discourage women from eating certain foods during pregnancy?



Source: Researcher

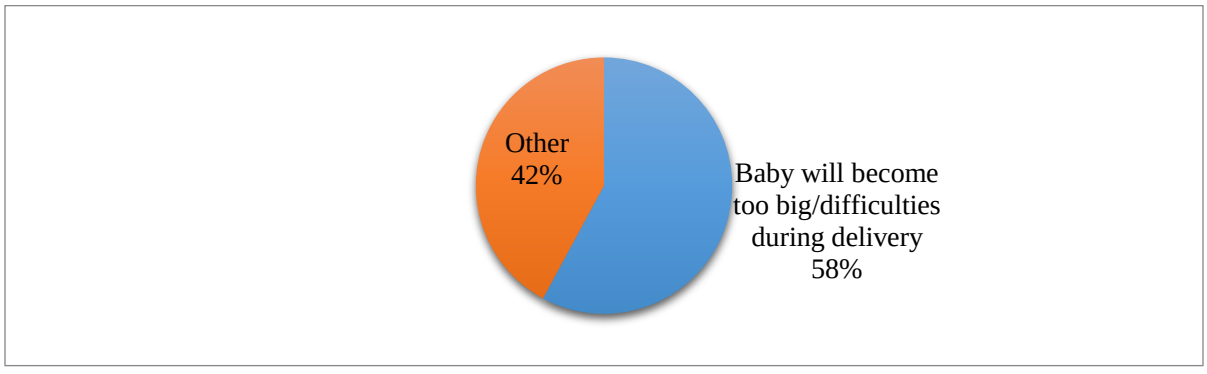
4.4.8 Reasons Given for Discouraging Pregnant Women from Eating Certain Foods

Respondents who said that pregnant women were discouraged from eating certain foods were further asked what the reasons were for discouraging the women from eating the foods. To this 58% of the respondents, there was a belief that consumption of the foods would result in the baby becoming too big leading to difficulties during delivery.

On whether there are foods that pregnant women do not eat or are restricted from eating below, are some of the findings from the FGD participants and key informants:

> ***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 ones 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).

Figure 4.18: Reasons for discouraging pregnant mothers from eating certain foods

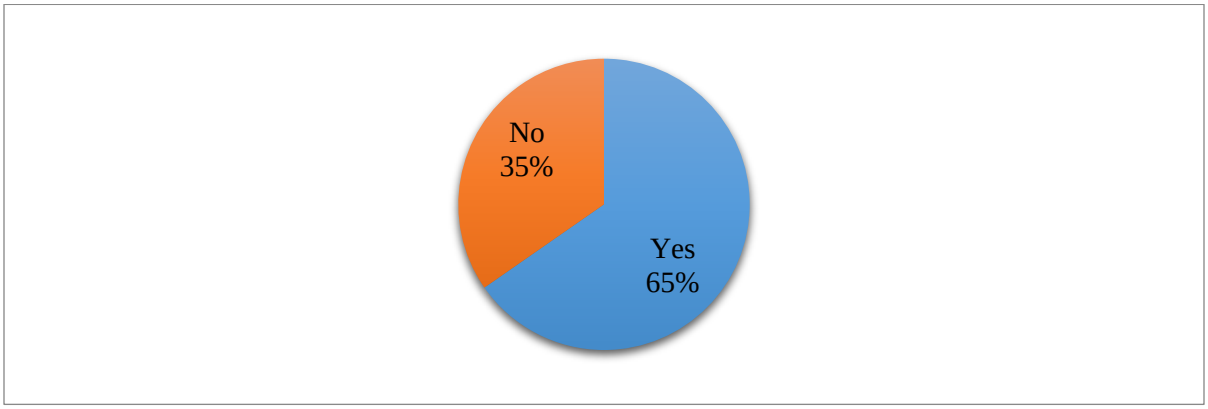


Source: Researcher

4.4.9 Since You Conceived Do You Make an Effort to Eat a More Nutritious Diet?

Concerning their eating habits since conception, 65% of the women, the study established, had made an effort to eat a more nutritious diet from the time they conceived. The remaining 35%, of the women as presented in the figure below said that they had not made an effort to eat a more nutritious diet.

Figure 4.19: Since you conceived do you make an effort to eat a more nutritious diet?



Source: Researcher

4.5 Objective iii: Factors that Influence Dietary Habits

4.5.1 Socio-economic Status

Asset ownership is a proxy indicator of one's economic status. Respondents' socioeconomic status in this study was assessed by asking several questions on asset ownership and household income. Below is a table displaying the results. The table also displays respondents' average income.

Table 4.9: Household income and asset ownership

Socio-Economic Variables	Frequency	Percentages	
On average what is your monthly household income in Kenya shillings?			
Less than 3,000	33	28%	
3,001-6,000	21	18%	
6,001-9,000	13	11%	
9,001-13,000	12	10%	
13,001-18,000	9	7%	
18,001-22,500	8	6%	
Above 22, 501	23	20%	
Does your household have any of these items?[c]			
Electricity	107	90%	
Radio	110	92%	
Television	90	76%	
Mobile telephone	100	84%	
Refrigerator	12	10%	
Microwave	8	7%	
Solar panel	12	10%	
Sofa	97	82%	
Does any member of your household own			
A car/truck	16	13%	
Motorcycle	32	27%	
Bicycle	4	3%	
Tractor	2	2%	
No Asset owned	76	64%	
Do you own the house you live in or do you pay rent?			
Own	83	70%	
Pay rent	32	27%	
Live with parents/relatives	4	3%	
Does your household own the following domestic animals?	Average number owned	Minimum number owned	Maximum Number owned
Cows (n=43)	2	1	4
Goats (n=27)	3	1	6
Sheep (n=16)	3	1	9
Chicken (n=55)	8	1	42
Ducks (n=4)	3	1	6

Multiple responses allowed. Source: Researcher

To determine the factors influencing dietary habits among pregnant women seeking ANC services in Othaya Constituency, a chi-square test was done to establish the relationship between demographic factors, (age, marital status, and household size), economic factors such as (household income and occupation) cultural factors and dietary habits. Among the demographic factors, household size was statistically significant to dietary habits ($\chi^2_{(1)} = 4.487$; p=0.034). And in economic factors, respondents' occupation was statistically significant to dietary habits ($\chi^2_{(5)} = 15.271$; p=0.009).

Table 4.10: Factors that Influence Respondents' Dietary Habits

Factor variables	Overall (n=119)	< 3 Food Groups (n=64)	≥ 3 Food Groups (n=55)	χ^2	p-values
Age group					
18 - 30 Years	81 (68%)	46 (72%)	35 (64%)	0.9237	0.337
Above 30 Years	38 (32%)	18 (28%)	20 (36%)		
Level of Education					
Primary (incomplete)	5 (4%)	3 (4%)	2 (4%)		
Primary (completed)	19 (16%)	11 (17%)	8 (14%)		
Secondary (incomplete)	13 (13%)	8 (12%)	8 (14%)		
Secondary (completed)	43 (36%)	21 (32%)	22 (40%)	3.9233	0.687
College	26 (22%)	16 (25%)	10 (18%)		
University	8 (7%)	5 (8%)	3 (5%)		
Other	2 (2%)	0	2 (4%)		
Occupation					
Housewife	30 (25%)	16 (25%)	14 (25%)		
Trading/business	21 (18%)	14 (22%)	7 (13%)		
Works in own farm	26 (22%)	7 (11%)	19 (34%)	14.930	0.011*
Casual labourer	11 (9%)	7 (11%)	4 (7%)		
Salaried worker	19 (16%)	15 (23%)	4 (7%)		
Other	12 (10%)	5 (8%)	7 (13%)		
Marital Status					
Married monogamous	91 (76%)	46 (73%)	45 (81%)		
Married polygamous	2 (2%)	1 (1%)	1 (2%)		
Single (Never married)	23 (19%)	16 (25%)	7 (13%)	3.8742	0.423
Separated	2 (2%)	1 (1%)	1 (2%)		
Widowed	1 (1%)	0	1 (2%)		
Household income					
Less than 3,000	33 (28%)	22 (34%)	11 (20%)		
3,001-6,000	21 (18%)	8 (13%)	13 (25%)		
6,001-9,000	13 (11%)	6 (9%)	7 (13%)		
9,001-13,000	12 (10%)	4 (6%)	8 (14%)	8.9592	0.176
13,001-18,000	9 (7%)	7 (11%)	2 (4%)		
18,001-22,500	8 (6%)	5 (8%)	3 (5%)		
Above 22, 501	23 (20%)	12 (19%)	11 (20%)		
Household Size					
1 - 4 HH Size	94 (79%)	55 (86%)	39 (71%)	4.0258	0.045*
5 - 8 HH Size	25 (21%)	9 (14%)	16 (29%)		
Culture					
Yes	11 (9%)	6 (9%)	5 (9%)	0.0028	0.957
No	108 (91%)	58 (91%)	50 (91%)		

Source: Researcher

Findings from this study did not show age as a factor that influenced respondent's dietary habits. These findings differ from those of a research carried out in Mauritius whose findings show that age was one of the most influential factors on respondents' dietary habits. Findings showed that younger people were more prone to consuming foods that were energy-dense while older people were more likely to consume more nutrient-dense foods (Krige S. M et al., 2012).

On the respondents' education level and its relationship with the foods that the respondents ate, data from the 24-hour recall revealed that most of the respondents who reported to have consumed milk, a rich source of calcium, in the 24 hours preceding the interview had either completed Secondary or had a higher education level. Depicted in the table, below are the results.

Table 4.11: Level of education and consumption of milk

Level of Education and Consumption of milk (n=11)	**Frequency**	**Percent**
Primary (incomplete)	0	0%
Primary (completed)	1	9%
Secondary (incomplete)	1	9%
Secondary (completed)	4	36%
College	3	27%
University	1	9%
Other	1	9%
Total	**11**	**100%**

Source: Researcher

In addition, the findings showed that most of the respondents who reported to have consumed green leafy vegetables, the previous 24 hours preceding the interview had completed Secondary school or a higher level of education as shown in table 4.12.

Table 4.12: Level of education and consumption of green leafy vegetables

Level of Education and Consumption of Green Leafy Vegetables (n=48)	Frequency	Percent
Primary (incomplete)	3	6%
Primary (completed)	5	10%
Secondary (incomplete)	7	15%
Secondary (completed)	21	44%
College	9	19%
University	1	2%
Other	2	4%
Total	**48**	**100%**

Source: Researcher

Available literature shows marital status as one of the factors that contributed to the consumption of healthier diets (French, S.A., Tangney, C.C., Crane, M.M., et al., 2019). In this study marital status did not has a significant relationship with the dietary habits of the study participants.

The size of a household may affect the household and indeed individual dietary habits. This is because financial resources tend to be constrained and the household has to weigh between having a nutritious diet and feeding every member of the household. A study carried out among pregnant women in Ethiopia revealed a significant positive relationship between family size and the respondents' nutritional status (Tsegaye C., Tamiru D., and Belachew T., 2020). Findings from this research showed a significant relationship between household size and respondents' dietary diversity score.

Income According to available data, monthly income has been found to have a positive relationship with good dietary practices (Tenaw et al., 2018). Lower-income households according to available literature, purchase food of lower nutrition quality (French, S.A., Tangney, C.C., Crane, M.M., et al.). In this study, respondents' income findings showed that there was a relation between the respondents' income and the food they ate. Analysis from data gathered using the dietary diversity questionnaire showed that the majority of the respondents who reported to have consumed vitamin A-rich foods in the previous 24 hours preceding the interview were had an income of more than

3,000 Kenya Shillings with 33% earning between 3,000 Kenya Shillings ad 20% earning between 6001-9000 Kenya Shillings. This is displayed in the table below.

Table 4.13: Level of income and consumption of vitamin A-rich foods

Level of Income and consumption of vitamin A-rich foods (n=15)	Frequency	Percentage
Less than 3,000	1	7%
3,001-6,000	5	33%
6,001-9,000	3	20%
9,001-13,000	2	13%
13,001-18,000	1	7%
18,001-22,500	2	13%
Above 22, 501	1	7%
Total	**15**	**100%**

Source: Researcher

Further, as displayed in the table below, findings from this research portrayed that most of the respondents who reported to have consumed green leafy vegetables the 24 hours preceding the interview were earning more than 3,000 Kenya Shillings.

Table 4.14: Level of Income and consumption of green leafy vegetables

Level of Income and consumption of dark green leafy vegetables (n=48)	Frequency	percentage
Less than 3,000	7	15%
3,001-6,000	13	27%
6,001-9,000	5	10%
9,001-13,000	8	17%
13,001-18,000	2	4%
18,001-22,500	2	4%
Above 22, 501	11	23%
Total	**48**	**100%**

Source: Researcher

Additionally, concerning income, as displayed in the table below, the findings further revealed that most of the respondents who reported to have consumed meat or fish in the previous 24 hours preceding the interview had a higher income.

Table 4.15: Level of income and consumption of meat/fish

Level of Income and consumption of Meat/Fish (n=17)	Frequency	Percentage
Less than 3,000	2	12%
3,001-6,000	2	12%
6,001-9,000	3	18%
9,001-13,000	1	6%
13,001-18,000	2	12%
18,001-22,500	1	6%
Above 22, 501	6	35%
Total	**17**	**100%**

Source: Researcher

Cost of food versus the family size came up as an issue that is taken into consideration when choosing food with one of the participants saying that one had to weigh between feeding every member of the family and providing them with a nutritious diet. In the scenario highlighted below, cabbage would be chosen over amaranth and kales, both of which are green leafy vegetables and a very good source of iron.

> *P5: Cost is high like if I find in the market someone is selling there (amaranth), my family consists of three to four people, and one bunch of terere costs ten shillings, instead of buying terere or small bunches of sukumawiki (kales), I opt for cabbage at 30 shillings that will be enough to feed my family, so you find that one is weighing how to feed a family than following the protocols of nutrition, carbohydrates, and proteins because it is not affordable.* (27 years old from Iriaini Ward)

Another FGD participant brought in the issue of the cost of food as a factor that influences dietary habits.

> *P: Let's say you want to eat ugali, when you go to the shop you compare the prices of the maize flour and you compare with the wheat flour prices.*

Culture has, according to available literature been reported to influence dietary patterns of pregnant women. Findings from a study carried out in South Africa showed that participants' dietary habits were moulded by cultural taboos or beliefs (Chakona C. and Shackleton G., 2019). In this study, foods reported as those that participants habitually ate are those that are associated with the Kikuyu community showing the culture had a role to play. Below is what some FGD participants reported concerning food restrictions for pregnant women.

P: Yes like omena (25 years old from Chinga Ward)
M: People here don't like omena?
P: They don't know how to cook them
M: ***Just tell us if there are foods that pregnant women are restricted from or are prohibited from?***
P2: Avocado and eggs are being. (29 years old from Iriaini Ward)
M: Okay and is there anything else being prohibited?
P5: Ripe bananas
M: Ripe bananas. Okay P5 has mentioned ripe bananas, anything else?
P5: And meat also
M: Okay meat. Now explain to us what reason it is they are being discouraged from eating this food?
P5: Because the child will grow too big.
M: The child will grow too big! And what happens when the child becomes big?
P5: It will bring you problems
M: Problems like!
P5: I will have to undergo a caesarean section.

A key informant had the following to say concerning the issues that impact the dietary habits and nutritional status of pregnant women.

> ***Res****. The first major factor is social-economic status. It determines whether they are getting the food, whether they are getting adequate food or not. The other thing is their health status, their overall health status. For example, those that have severe early pregnancy symptoms, might not be able to take them, they know what to take but the physical conditions or their health status does not allow them to take the food. That one also has a huge effect and we usually see it in mothers that we have admitted with severe early pregnancy symptoms. The other thing that affects nutrition is food availability. If I am educated on the food to take and I can afford them, then the question becomes, "Is the food available or do I just take what is available?"* (Male medical doctor in charge of one of the facilities)

And in one of the focus group discussions, participants reported food availability and cost of food as some of the issues that are taken into consideration in the choice of food and therefore factors that contribute to the dietary habits.

> ***M: What are the factors that are taken into consideration when the choice of food made?***
> *P2: The nature of preparation*
> *P3: The availability*
> ***M: What do you mean by saying availability?***
> *P3: Like now we are eating carbohydrate foods because they are the ones available, we are eating ugali, rice, and githeri because they are the easily available ones.*
> ***M: Any other factor?***

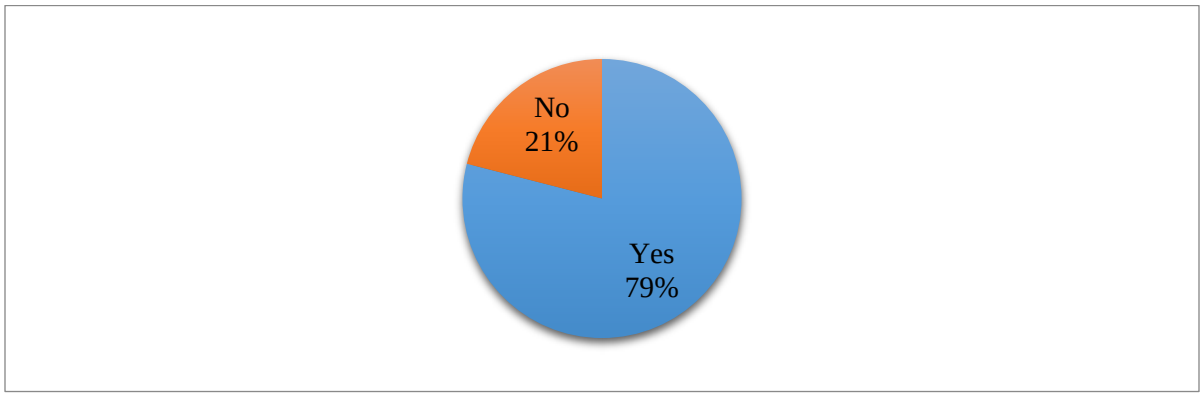
P3: Most people eat what they can afford.
M: Please elaborate that
P2: Like we have said that many homes people don't grow enough food to store, if one goes for casual labour work and is paid in terms of food like maize, that is what they will use to get flour for ugali or they will cook githeri, so mostly it is what available at that particular time.

4.6 Objective iv: Role of Dietary Knowledge on Dietary Habits and Nutritional Status

4.6.1 Knowledge Assessment

The dietary knowledge of the study participants was gauged using various factors; among them, respondents were asked "*Please tell me some of the food groups you know and the nutrients they provide to the body"*. The food group and the nutrients it provides to the body were further coded as *"Yes"* for correctly mentioned nutrients and *"No"* for incorrectly mentioned nutrients. Over three quarter (79%) of the respondents identified the correct nutrients of the food group mentioned while 21% of the respondents incorrectly identified the nutrients of the food group mentioned. This shows that most of the pregnant women had a good knowledge of food groups and the nutrients that they provide to the body and as a result, they would have been able to make a choice of food based on its nutritional content.

Figure 4.20: Respondents' knowledge of food groups



Source: Researcher

Table 4.16: Reasons for eating food more regularly and respondent's nutritional knowledge

	Nutritional Knowledge	
Reason for eating food more regularly	**Yes (n=59)**	**No (n=16)**
Personal preference	42%	69%
Food is more available in the locality	27%	25%
Food craving	10%	6%
Family preference	15%	31%
Cost of the food	5%	0%
Nutritional content	12%	0%
Other	15%	0%

Source: Researcher

Participants in one of the focus group discussions were of the view that pregnant women had enough nutrition knowledge and therefore knew the food they ought to eat.

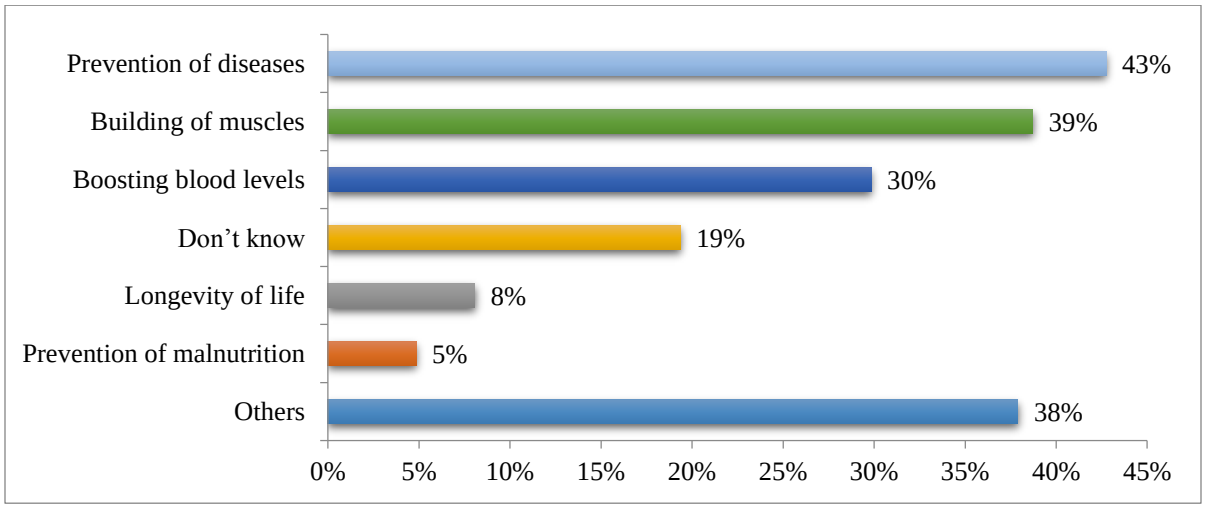
> ***M****: Do pregnant women get enough nutrition information, on the kind of food they are supposed to eat?*
> *All in chorus: Yes*
> ***P5****: Yes they have, they know what they are supposed to eat but affordability is a challenge.*

Concerning knowledge, below is what one of the Key Informants had to say:

> Res: *Yeah, they have adequate knowledge on nutrition because we insist very much on the health workers giving information on nutrition to the client. So the only gap I would say there would be is the affordability of some of the foods and now that the greatest percentage of the population does not grow these foods, and have to purchase, issues to do with finances become a challenge. They don't have money to purchase the food that they know. You know one might be knowing, but they do not have the specific foods that they might be combining to make a healthy diet. So if one does not have the money, it means they have to go with what they can afford. So finances are an issue but the knowledge they have.* (Male clinician in charge of one of the health facilities).

Further, respondents' knowledge was assessed through being asked several related questions. As presented in the figure below, each function of food in the body was mentioned by less than half of the study participants with prevention of diseases as a function being the one that was mentioned by more participants.

Figure 4.21: Which effect does the food have on human health?



Source: Researcher

4.6.2 Which People in the Population Require More of Certain Foods?

The respondents asked which people in the population require more of certain foods, more than half (63%) of them mentioned pregnant women, 41% mentioned the elderly, 40% mentioned children under the age of five years with only 6% and 2% mentioning lactating mothers and women of reproductive age respectively.

Table 4.17: Which people in the population require more of certain foods?

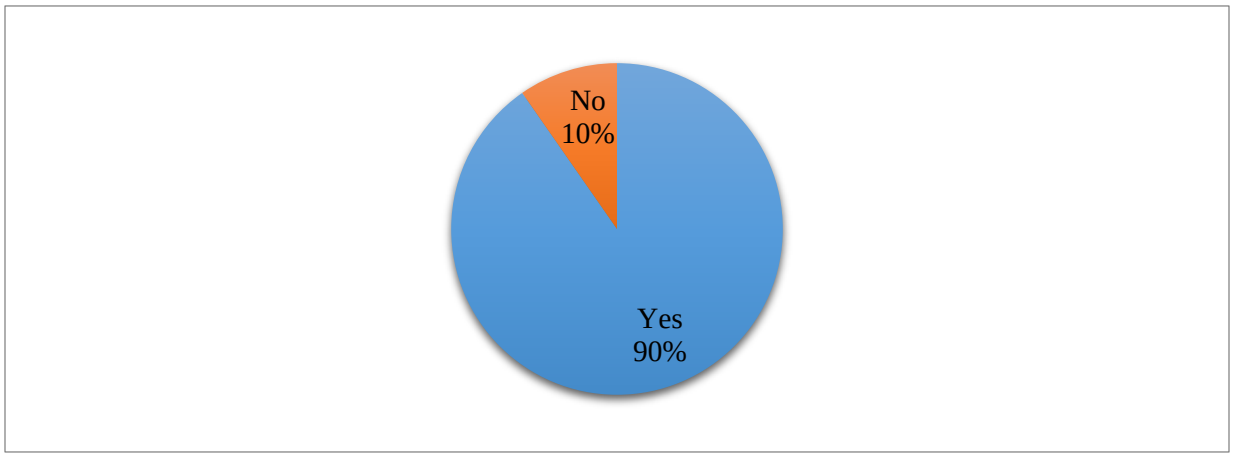
	Frequency	Percentages
Women of reproductive age	3	2%
Pregnant women	75	63%
Lactating mothers	7	6%
Children below 5 years	48	40%
The elderly	49	41%
Women	1	1%
Other	49	41%
Don't know	23	19%
Multiple responses allowed		

Source: Researcher

4.6.3 Whether Pregnant Women Should Eat More of Certain Foods

Participants were asked if there are certain foods that pregnant women should eat more of and 90% answered in the affirmative with only 10% saying the contrary.

Figure 4.22: Participants response to whether pregnant women eat more of certain foods



Source: Researcher

4.6.4 Foods Pregnant Women Should eat more of

And asked about the particular foods that pregnant women should eat more of, 81% of the women responded by saying that this should be iron-rich foods, 80% said that they should eat more Vitamin C rich foods, with less than half (32%) mentioning calcium-rich foods.

Table 4.18: Foods that pregnant women should eat more of

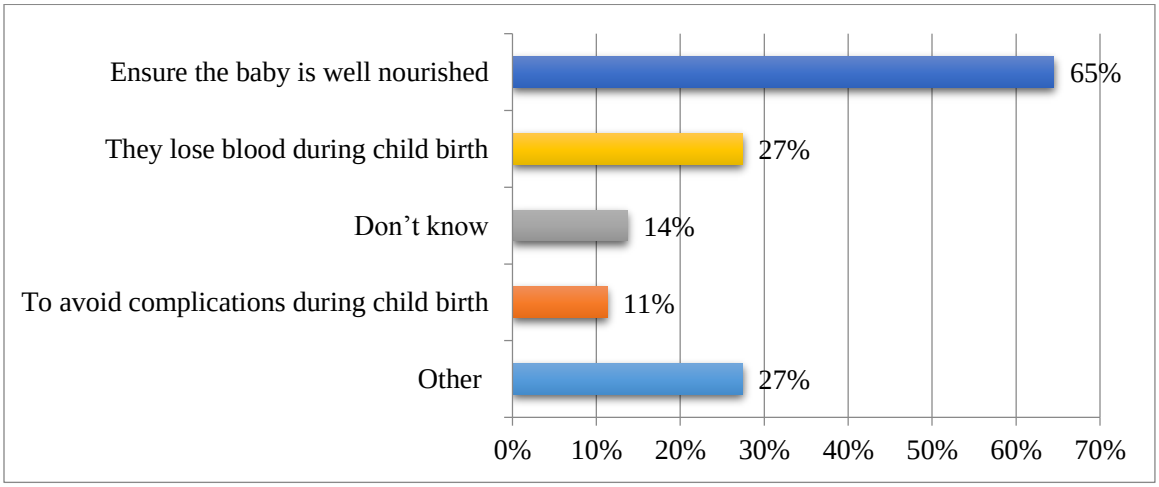
Which of these foods	Frequency	Percentages
Iron-rich foods	87	81%
Vitamin C rich foods	86	80 %
Calcium-rich foods	34	32%
Don't know	2	2%
Other	23	22%
Multiple responses allowed		

Source: Researcher

4.6.5 Reasons Pregnant Women Require to Eat More of the Foods?

Respondents were further asked why pregnant women require more of these foods. To this, as displayed in the figure below, 65% of them said it was to ensure that the baby was well-nourished, 27% said it was because they lose blood during childbirth and 11% said that that it was to avoid complications during childbirth.

Figure 4.23: Why pregnant women require more of the foods



Source: Researcher

4.6.6 Last Time Respondent had Received Nutrition Education/Information

Respondents were asked when the last time, before the ANC visit that they receive nutrition information. Out of the 119 participants, 77% reported having received information more than six months before the interview. Only 12% of the women reported having received information one week or less from the time of the interview.

Table 4.19: When was the last time you received nutrition education/information?

	Frequency	Percentages
0-1 week ago	14	12%
One month ago	7	6%
1-6 months ago	6	5%
More than 6 months ago	92	77%
TOTAL	**119**	**100%**

Source: Researcher

Further, respondents were asked what the source of the nutrition information was. To which 34 % said it was from trained health workers. Only a small percentage 3% reported that they had received information from a Community Health Worker (CHW) or a Community Health Volunteer (CHV). Fifty-seven (48%) of the respondents said that they had received information from other sources. Among the other sources mentioned were radio, television, and teacher from school or college.

Table 4.20: Respondents' source of nutrition information/education?

	Frequency	Percentages
Trained health worker	41	34%
Community health worker/Community Health Volunteer	4	3%
Read from publication	17	14%
Other	57	48%

Source: Researcher

One of the key informants reported that in the community, there was no formal way of providing nutrition information/education and it was, therefore, possible that pregnant women received information from neighbours and relatives. There could be a disadvantage in this as some of the women may end up getting inaccurate information, which could lead to wrong decisions being made.

> *Int. What are their sources of nutrition information?*
> *Res. In the hospital setup, it is the health care workers. The ones at MCH, Clinical Officers, the ones that are at the maternity ward, myself included.*

> *Int. How about in the community? Is there a way that they can get nutrition information?*
> *Res. In the community, there is no formal way of providing the information. I am tending to think that they get it from neighbours and relatives.* (Male medical doctor in charge of one of the health facilities)

Another key informant reported that community health volunteers were working in the community within the catchment population of the health facility to provide nutrition education and counselling:

> *Res: Community health workers so that they are our eyes and ears in the community. So whatever information we give them, they can easily reach that patient because within a day we only see several patients, but for them, they go to the community level, they can give them the right information because we cannot reach them or even those who cannot come to the health facility.* (Male clinician in charge of one of the health facilities)

Although community health volunteers were reported to be on the ground working to provide nutrition education and counselling to pregnant women, it is possible that they were not very active since only a few women reported having received information from them.

Concerning the source of knowledge for pregnant mothers here is what another key informant said:

> *Int: What is the main source of this knowledge on nutrition?*
> *Re: The majority of these mothers are learned so they know. And also when they come to us. We also do give them health education on the benches, together with our community health workers. So they know.* (Health worker at the Sub-County)

Despite having many women reporting that they received nutrition education/information from trained health workers, which is a positive thing, almost half (47%) said that they had received education/information from other sources. Some of these sources included school teachers, TV, and radio.

4.7 Objective v: Strategies in Addressing Maternal Nutrition

Asked which interventions existed to address maternal nutrition, 39% of the respondents said that there was nutrition education and counselling, 5% said there was food fortification. As to whether pregnant women received nutrition education when they came to the ANC clinic, 98 (79%) of the respondents said that they did. And on being asked whether they received nutrition education on a

particular day that they attended ANC clinic, 94% of the women said that they did with only 6% saying that they did not. Concerning the provision of nutrition supplements commonly known even to the women as IFAS, to pregnant women when they visited ANC clinic 91% of the respondents said that these supplements were provided and one whether they were given the supplements, 95% of the women said that they were. Only 5% of the women said that they were not provided with IFAS. Below is what one of the Key informants said concerning the strategies that are in place to address maternal nutrition:

> *Res. The first thing is of course education. That is the major intervention, insisting that they take a least four meals a day and snacks in between, insisting that they increase their intake of vegetables and fruits, we insist that they take a balanced diet. We provide iron and folic acid supplements. And for those with malnutrition, we manage the malnutrition with fortified feeds, which are supplied by the nutritionist. For those with specific conditions like hyperemesis gravidarum, we make sure we manage that so that they can be able to feed appropriately. I think those are many of the interventions relating to nutrition. At the community level, we have community health volunteers. They are of very much help at the community level. Also various organizations, community-based organizations, or non-governmental organizations.* (Male medical doctor in charge of one of the health facilities)

Some key informants spoke of Community Health Volunteer whom they said were working at the community level to among other things provide nutrition education to pregnant mothers.

> *Res: We also have Community Health Volunteers. They are in the County and they are already trained and part of their training module on maternal and child nutrition. So even if we are not able to get to everybody in the community, as health workers, we are sure that the Community Health Volunteers are doing the work. They give health education on nutrition and as I mentioned, we also give them information on how to do kitchen gardens because people should not have to always go to the shops. The CHVs are in the forefront and they demonstrate how one is supposed to make a kitchen garden so that one has their greens readily available around them and they don't always have to go to the shops and buy. So CHVs play a huge role in educating the community members where even not the pregnant women are, on nutrition.* (Kenya Registered Nurse at the Sub-County level)

Table 4.21: Strategies to Address Maternal Nutrition

Intervention	Frequency	Percentages
What is being done in your community to help women improve their dietary habits and nutrition status?		
Nutrition education and counselling	46	39%
Food fortification	6	5%
Other	67	56%
Do pregnant women receive nutrition education and counselling when they visit the ANC clinic in this health facility?		
Yes	94	79%
No	2	2%
Don't know	23	19%
Did you receive nutrition education and counselling at this facility today?		
Yes	113	95%
No	6	5%
Do pregnant women receive nutrition supplements when they visit the ANC clinic in this health facility?		
Yes	109	92%
Don't know	10	8%
Did you receive nutrition supplements at this facility today?		
Yes	113	95%
No	6	5%

Source: Researcher

In an open-ended question, the study participants were asked what they thought needed to be done to address the dietary habits and nutritional status of pregnant women in their community.

On what would need to be done at the health facility level, participants in this study said there was the need for frequent nutrition education and counselling provision of nutritious food for those women who are cannot afford it and to give women special training on nutrition and have specific nutrition days.

And on what needs to be done at the community level to help pregnant women improve their dietary habits and nutritional status, respondents said that nutrition education and counselling at the community level is among the strategies that need to be employed to aid pregnant women in

improving their dietary habits and nutritional status. Others believed that pregnant women in the community who have financial difficulties need to be provided with nutritious foods such as greens and fruits. Still, some believed that pregnant women should be provided with seeds for greens, fruits, and cereals so that they may produce the foods themselves.

Some of the FGD participants had the following to say when they were asked about what needed to be done to help pregnant women eat a nutritious diet:

> *P2: If it is possible women requires to be empowered and businesses set up for them so that they can earn and support themselves and become independent instead of looking up to the husband.* (29 years old from Iriani Ward)
> *P4: I think even if pregnant women undergo the seminars and are taught about diet and nutrition yet they don't have money to put that to practice it has no meaning, I would suggest that pregnant need to be given some cash to support themselves.* (32 year old from Iriani Ward)
> *P1: I would suggest that pregnant women in a certain area can form kind of a merry-go-round and contribute money to help each other.* (25 years old from Karima Ward)

Another FGD participant had the following to say:

> *P2: Since covid-19 came things have been very hard financially and being able to make savings is not easy, so getting help in the community might not be easy but in the hospital everybody attends ANC and if there is nutritious food meant for pregnant women it could normally be given to those who are identified as needy cases, and a pregnant woman could be given 1kg of beans which is protein. Alternatively, the food can be channelled to the chief's office so that the food is given to needy pregnant women. So my suggestion would be that the hospital helps needy pregnant mothers with beans as a source of protein, in addition to the iron and folic acids tablets that they provide to the pregnant mothers. For those who can access the chief's office, the beans can also be channelled to the needy through the office, and then the women can supplement for themselves with fruits and green vegetables from the household savings that they get, those are my views.*

On who should be involved in implementing these initiatives**,** participants in this study had expectations from the County Government of Nyeri which they said needed to channel support, especially for the women with financial constraints through the community or through the health facilities from where those who are targeted can access it. The local administration (Chiefs and Assistant Chiefs) were mentioned as some of those who should get involved at the community level. Village elders were also mentioned among those who needed to be involved at the community level, with some participants mentioning local politicians and the entire community.

At the health facility level, health workers were mentioned as those who need to get involved in supporting pregnant mothers to improve their dietary habits and nutritional status.

Key informants were asked whether, in their opinion, the strategies that had been put in place were sufficient to address maternal nutrition had the following to say:

> *Int: You have talked about the interventions that exist, but in your opinion, are these interventions sufficient to address maternal nutrition and especially the nutrition of pregnant mothers?*
> *Res: I don't think it's enough. I feel something more needs to be done because one doctor cannot take care of everything. There are those facilities without a nutritionist. I think the government should have more nutritionists and at least each hospital should have one or two nutritionists so that if a mother comes before she even sees a doctor or a nurse to be attended to she will have to know what she is expected to do throughout the pregnancy period depending on her diet. I think it would be better if we can get that. The community needs also to be sensitized by the health workers. They cannot only rely on the CHVs. CHVs know about nutrition but I think someone who had learned more about nutrition is better placed to give the right information.* (Male medical doctor in charge of one of the health facilities).

One of the key informants believed that the strategies were sufficient.

> *Res: If those interventions are done and done well, they are enough and I don't think there is a need to have any more. We only need to strengthen what we already have and carry out those interventions as they should.*

Findings from this study reveal that respondents appeared to attach certain meaning to food which contributed to this food either being among those that were habitually consumed or those that were not habitually consumed. *Omena*, for example, was looked at as strange while on the other hand respondents reported eating certain foods like githeri habitually. The fact that *githeri* and *mukimo* were reported among the foods habitually eaten by a number of respondents shows that there was social learning which had taken place as these foods are more associated with the Kikuyu Community. The findings, therefore, align with both the symbolic interaction theory and the social learning theory.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

Here, the researcher discusses the findings presented in the previous chapter. The researcher, in addition, provides the conclusions, recommendations, and areas of potential further research.

5.1.1 Nutritional Status of Pregnant Women

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 serve as 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 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% of women in this study whose MUAC was less than 23 cm were at an increased risk of becoming anaemic. Respondents with MUAC measurements of less than 23 cm were seen to have a lower dietary diversity score in comparison with their counterparts with MUAC measurements of 23 cm or higher. Respondents whose Hb level was less than 11g/dl, on the other hand, were found to have a higher dietary diversity. A possible explanation of this is that green leafy vegetables, a rich source of iron were not among the foods that these participants reported to have been habitually consuming.

5.1.2 Dietary Habits of Pregnant Women

Maize was mentioned by 85% of the respondents as one of the foods consumed more regularly while the rice was mentioned by 65% of the women. On the other hand, meat was mentioned by only 14% as one of the foods that are more regularly consumed while milk was mentioned by only 9%. The finding, therefore, revealed that the pregnant women consumed more grain foods, which

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 fewer fruits per day (Oniang'o et al., 2003). The results are also consistent with those of a research which took place in Nigeria, according to, which pregnant women consumed a more carbohydrate diet compared to a 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 119 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 a 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. The 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 that were associated with an 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 the interview, 31% had not. Vitamin A deficiency is, according to 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.

5.1.3 Factors that Influence Respondents' Dietary Habits

It emerged that most of the women participating in this research chose the food they consumed based on other reasons but not the nutritional content in the food with 49% of them saying that they chose to eat the food they ate more regularly because of personal preference. Respondents' age and marital status, did not have a significant relationship with the respondents' dietary diversity. There may be a need for further research to determine the reason why age and marital did not influence the dietary habits of pregnant women.

Household size and respondents' occupation were according to findings statistically significant to dietary respondents' dietary diversity score. This could be explained in that with a bigger household size comes requirements for higher quantities of food to feed every member of the family and therefore a higher budget. Where financial resources are constrained, therefore, one would have to weigh between feeding every member of the household and the nutritional content of the food. Evidence shows that that diets that are lower in the quality of nutrition, cost less than healthy diets, and hence in terms of cost, they are more accessible by people whose socio-economic status is lower (Darmon and Drewnowski, 2015). Regarding occupation as one of the factors that were seen to have a significant relationship with participants' dietary habits, this could be explained in that certain occupations have an association with a higher income and hence a higher purchasing power.

Further analysis of the data revealed that there was true, a monetary consideration attached to the respondents' dietary habits as. Findings showed that pregnant women did not always eat what they wanted. Rather they ate what they could afford. Some of the women reported not eating certain foods as often as they could have preferred owing to the cost attached to those foods, which they felt was above their reach. Accordingly, women who had a higher household income were more likely to consume more nutritious foods like green leafy vegetables and milk, a finding that could be explained in that, with a higher income, one can afford nutritious foods, which are more expensive. These results are consistent with those of a study carried out among pregnant women in Ethiopia (Tenaw et al., 2018). The findings from this study are also consistent with those of the study conducted in Mauritius which revealed that education was one of the most influential factors on eating patterns ((Krige S. M et al., 2012). On education and its relationship with the foods that respondents ate, findings showed that the majority of women who had higher education were more likely to consume more nutritious food such as green leafy vegetables and vitamin A-rich foods. These findings are also consistent with other findings which show that higher income and education almost directly translate to improved dietary practices (Oniag'o et al. 2003).

Culture came out as a factor that influenced the respondents' dietary habits as foods such as *githeri* and *mukimo(a mixture of maize and beans mashed with potatoes and greens)* commonly associated with the Kikuyu Community who made a majority of respondents for this study were

reported to be among those that were habitually consumed. On the other hand, foods like fish and *omena* (silver cyprinid/Lake Victoria sardine)**,** which is a very good source of calcium, was not mentioned among those foods that are habitually consumed. Chicken, which is a delicacy among the Luhyia, a community that lives in the Western part of the country was also not mentioned as among the foods that participants habitually consumed. This is despite findings from this research showing that fish was available within the study area. Fish and *omena* are common among the Luo community of Kenya (Odede Z.A, Hayombe P.O. and Agong' Patrick G. 2017).

Further evidence shows that *githeri* is a common dish among the Kikuyus while tilapia is a common delicacy among the Luo community majority of whom live in Western Kenya (FAO/GoK, 2018). Qualitative data collected from this study further helps uphold the position that culture was a determining factor in the dietary habits of the study participants. Participants in one of the focus group discussions said that foods such as *omena* (silver cyprinid/) are viewed as strange with some of the participants saying that they do not even know the method of its preparation.

Although a few of the respondents reported having heard some community members discourage pregnant women from consuming certain food items, no food taboos or traditions existed to restrict or prohibit pregnant women from eating any food according to the findings of this research. In addition for those food items which were mentioned as those that pregnant women were discouraged from eating, no respondent reported having avoided these foods or choosing the food they ate based on that consideration.

As a result of dietary limitations imposed by religious institutions, various food consumption patterns emerge. Studies have confirmed and findings reveal that religion is, indeed, a determinant in people's choice of food, with religion being the basis of some food beliefs and practices. Buddhism and Hinduism, for example, advocate for non-violence/non-injury, which is founded on the desire to avoid causing harm to other living creatures. For this reason, many followers of these religions are vegetarians (Sibal Vatika, 2018). In this study, none of the participants reported avoiding any foods based on their religious convictions or religious prohibitions. It can, therefore, be argued that religion was a determining factor in the respondents' choice of food because they

had the freedom to eat all the foods that they chose to without having to consider their religious beliefs.

5.1.4 Role of Dietary Knowledge on Dietary Habits and Nutritional Status

Although over three-quarters of the women who participated in this research had nutrition knowledge, it was established through the findings that this knowledge did not influence the dietary habits for most of them since nutritional content did not come out as one of the factors why the women chose to eat the food that they ate. These findings differed with findings of a study conducted among pregnant women in Ethiopia whose findings showed knowledge on nutrition as a factor that was associated with good practices of nutrition, (Tenaw, et al., 2018). A possible explanation of this finding could the cost of food because despite the education level if one lacks the purchasing power, this then poses a challenge in accessing nutritious foods. The other possible explanation could be found in the fact that participants in their growing up may not have been trained to choose food based on its nutritional content.

5.1.5 Strategies in Addressing Maternal Nutrition

Among the strategies in place to address maternal nutrition, are nutrition education and counselling, Iron and Folic Acid Supplements, and deworming; all the health facility levels. Fortified food too, was reported to be available at the facility level for the pregnant women who were malnourished. At the community level, though it was reported that there was nutrition education going on through the Community Health Volunteers (CHV), the majority of the pregnant women did not report having received any nutrition education and counselling from them only 3% of the women said that nutrition education and counselling had been provided to them by CHVs.

5.2 Conclusion

This study established a relationship between dietary habits and the nutritional status of pregnant women seeking ANC services in Othaya Constituency. According to the findings, the women habitually consumed the locally available foods with the starchy foods being the most habitually consumed. Though there is a variety of locally available fruits, fruits, and daily products (milk and meat) were not among the foods that the women habitually consumed. As for the factors that contributed to the women's dietary habits, household size and respondent's occupation came out

as significant factors. Further, there was a relationship between the respondent's dietary habits, education, level of income, and religion. And although the women, according to findings had good knowledge in nutrition, this, was not found among the factors that influenced their dietary habits but they chose the food they habitually ate based on other factors with only a small percentage choosing the food because of its nutritional content.

5.3 Recommendations

(a) Findings from this research showed that women start seeking ANC services late. The study recommends reinforcement of the need for pregnant mothers to start seeking ANC services early enough so that they may be able to attend at least the four ANC visits as recommended by WHO. This way, it will be possible to pick up any mother whose nutritional status is not adequate and corrective measures put in place.

(b) At the community level, Community Health Volunteers need to have a record and keep track of all pregnant women in the community to ensure that they not only seek ANC services but that they start early.

(c) Intensify nutrition education and counseling at the community level and sensitize the community on the need to choose food based on their dietary content and are therefore promotive of their nutritional status.

(d) 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 for those women who may be found anaemic.

(e) This research shows that most people ate the foods that were more easily available in the locality and those that were grown in the locality. Most of these foods were starchy foods and therefore the dietary diversity for most of them was below the mean. For this reason, the Ministry of Agriculture needs to come in too and teach mothers to grow more nutritious foods and eat them.

(f) Further, this study's findings showed that the cost of food is an important consideration in the choice of food. It has been documented that nutrient-dense foods are more expensive.

There are those pregnant mothers who even though they would want to eat food that meets their nutritional needs cannot afford them owing to financial constraints. To support such women, it would help for the government and other stakeholders to support giving women the means 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 the form of loans that would attract low interest.

(g) The cost of seeds of nutritious foods such as green leafy vegetables and fruits should and other farm implements should be subsidized for pregnant women.

(h) The government and other stakeholders should come up with a way of subsidizing nutritious foods for pregnant women.

(i) The government through the Ministry of Agriculture should pay attention to not only pregnant women but women of reproductive age and those who have land need to be trained and emphasis made for them to plant nutritious foods.

(j) In addition, pregnant women who have financial difficulties need to be identified and support provided for them in terms of nutritious food.

(k) The Ministry of Education as part of Kenya's curriculum is teaching the students on nutrition in school and this is a good beginning point. In addition to this, the Ministry should have it emphasized to the students that they are not taught just for the sake of getting the knowledge. It should be impressed upon them to put this knowledge into practice by basing their dietary choice on the nutritional content of the food. Once they begin at an early age, it would help them make it a habit to choose food that will meet their dietary requirements and thus be promotive of their nutritional status.

5.4 Recommendations for Further Research

1. This research did not make much use of biochemical data that would have helped to establish the micronutrient status of the pregnant women. For this reason, it was not possible to establish if the women were adequately nourished in terms of micronutrients. Thus, it would be important for research that would make use of pregnant women's bio-chemical data, specifically focusing on micronutrients nutrition as it would aid in picking out cases of micronutrient deficiencies also known as hidden hunger.

5.5 Study Limitation

In this study, food quantities consumed by the respondents were not weighed and so it was not possible to establish whether for the foods they reported to have consumed, they had consumed it in quantities that were enough to meet their nutrition requirements.

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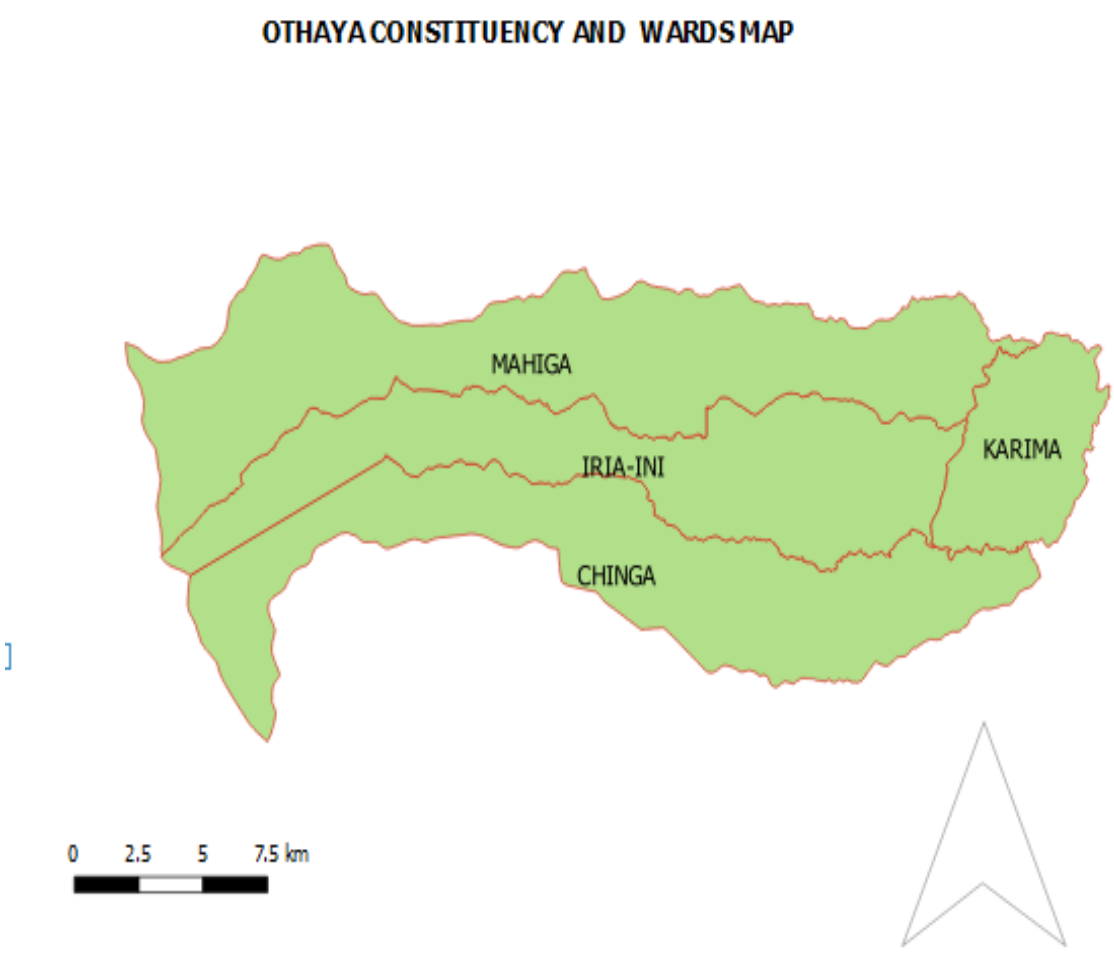
APPENDICES

APPENDIX I: MAP OF OTHAYA CONSTITUENCY



APPENDIX II: INTERVIEW WITH PREGNANT WOMEN

DIETARY HABITS AND NUTRITIONAL STATUS OF PREGNANT WOMEN: A STUDY OF PREGNANT WOMEN SEEKING ANC SERVICES IN OTHAYA CONSTITUENCY IN NYERI COUNTY, KENYA

INTERVIEW WITH PREGNANT WOMEN

Date of interview

Interviewer's name

Interview date_____day_____Month_____Year

Name of Ward

Name of Health Facility

Name of Ward respondent lives in

Respondent code

Is this the respondent's first ANC visit during your current pregnancy? *Je, hii ndio mara ya kwanza kwako kuja kupata huduma za wajawazito kwa ujauzito huu?*

1. Yes
2. No ***(Stop interview)***

SECTION A: SOCIAL DEMOGRAPHIC INFORMATION

I want to begin by asking you some questions about yourself.

1. How old are you? *Una umri gani?* _____ ***(indicate age in completed years)***
2. What is your marital status? *Umeolewa?*

(a) Married monogamous [ ]
(b) Married polygamous [ ]
(c) Single (Never married) [ ]
(d) Divorced [ ]
(e) Separated [ ]
(f) Widowed [ ]

3. What is the highest level of education you have completed? *Umesoma hadi kiwango gani?*

(a) Primary (incomplete) [ ]
(b) Primary (completed) [ ]

(c) Secondary (incomplete) [ ]

(d) Secondary (completed) [ ]

(e) College [ ]

(f) University [ ]

(g) None [ ]

(h) Other (Specify)……

4. What is your ethic group/tribe? *Nana*

(a) Embu [ ]

(b) Kalenjin [ ]

(c) Kamba [ ]

(d) Kikuyu [ ]

(e) Kisii [ ]

(f) Luhya [ ]

(g) Luo [ ]

(h) Maasai [ ]

(i) Meru [ ]

(j) Mijikenda/Swahili [ ]

(k) Somali [ ]

(l) Taita/Taveta [ ]

(m) Other (Specify)……

5. What is your religion?

a. Christian (Catholic) [ ]

b. Christian (Protestant) [ ]

c. Christian (Pentecostal) [ ]

d. Other (Specify)……

6. How many children have you given birth to? *Umezaa watoto wangapi?*.....

7. How many people (including adults) live in your household? *Ni watu wangapi huishi kwa nyumba yako pamoja na wewe?*.....

8. For how long have you lived in Othaya Constituency? *Umeishi Othaya kwa muda gani?*

……

9. What is your occupation/what kind of work do you mainly do? *Wewe hufanya Kazi ipi?*

(a) Housewife [ ]

(b) Trading/business [ ]

(c) Works in own farm [ ]

(d) Casual labourer [ ]

(e) Salaried worker [ ]

(f) Other (Specify)……

10. What is your main source of income? *Kwa kawaida huwa unapata pesa kwa njia ipi?*

(a) Trading/business [ ]

(b) From selling farm produce [ ]

(c) Casual work [ ]

(d) Salary [ ]

(e) Spouse provides [ ]

(f) Other (Specify)……

11. ***(If married)*** What if the highest level of education that your husband has completed? *Mume wako amesoma hadi kiwango gani?*

(a) Primary (incomplete) [ ]

(b) Primary (completed) [ ]

(c) Secondary (incomplete) [ ]

(d) Secondary (completed) [ ]

(e) College [ ]

(f) University [ ]

(g) None [ ]

(h) Other (Specify)……

(i) N/A ***(Go to Q 13)***

12. What is your husband's ethnic group? *Mume wako ni kabila ipi?*

(a) Embu [ ]

(b) Kalenjin [ ]

(c) Kamba [ ]

(d) Kikuyu [ ]

(e) Kisii [ ]

(f) Luhya [ ]

(g) Luo [ ]

(h) Maasai [ ]

(i) Meru [ ]

(j) Mijikenda/Swahili [ ]

(k) Somali [ ]

(l) Taita/Taveta [ ]

(m) Other (Specify)……

13. What is your husband's occupation? *Mume wako hufanya kazi ipi?*

(a) Trading/business [ ]

(b) From selling farm produce [ ]

(c) Casual work [ ]

(d) Salary [ ]

(e) Spouse provides [ ]

(f) Other (Specify)……

SECTION B: DIETARY HABITS

14. Which foods are available locally? *Ni chakula ipi huwa inapatikana huku?*

(a) Maize [ ]

(b) Legumes (beans, lentils) [ ]

(c) Irish potatoes [ ]

(d) Rice [ ]

(e) Milk [ ]

(f) Meat [ ]

(g) Eggs [ ]

(h) Chicken [ ]

(i) Vegetables [ ]

(j) Tomatoes [ ]

(k) Sweet potatoes [ ]

(l) Arrow roots [ ]

(m) Other (Specify)……

15. Which fruits are available locally? *Ni matunda gani huwa yanapatikana huku*

(a) Passion fruits [ ]

(b) Oranges [ ]

(c) Pawpaw [ ]

(d) Water melon [ ]

(e) Mangoes [ ]

(f) Thorn melon [ ]

(h) Other (Specify)……

16. Which of these are produced in the locally? *Kati ya hizo, ni zipi hukuuzwa huku?*

(a) Maize [ ]

(b) Beans [ ]

(c) Irish potatoes [ ]

(d) Beans [ ]

(e) Rice [ ]

(f) Wheat and wheat products [ ]

(g) Milk [ ]

(h) Meat [ ]

(i) Eggs [ ]

(j) Chicken [ ]

(k) Vegetables [ ]

(l) Tomatoes [ ]

(m) Sweet potatoes [ ]

(n) Arrow roots [ ]

(o) Other (Specify)……

17. Do you or any member of your household own any land, which is used for growing food crops or raising animals? *Je kati yako na jamii yako, kuna yule ambaye ana shamba ambapo chakula hukuuza ama kufuga mifugo?*

(a) Yes [ ]

(b) No ***(Go to question 18)*** [ ]

18. Is the food produced in the land sufficient for your household? *Je, kile chakula hukuuzwa kwa hiyo shamba kinatosha jamii yako?*

(a) Yes [ ]

(b) No [ ]

19. What is the **MAIN** source of the food you eat? *Je, kwa kawaida huwa unakipata wapi kile chakula wewe hula?*

(a) Own production [ ]

(b) Purchased [ ]

(c) Borrowed, gifts from friends, exchanged for labour [ ]

(d) Other (Specify)……

20. Who, in your household chooses the food you and other members eat? *Nani katika familia yako huamua kile chakula wewe na watu wengine katika familia huwa mnakula?*

(a) Self [ ]

(b) Spouse [ ]

(c) Mother [ ]

(d) Other (Specify)……

21. Which foods do you eat more regularly? *Je, ni vyakula vipi unakula mara kwa mara zaidi?* ***Do not read the list. Tick all that are mentioned.***

(a) Maize dishes [ ]

(b) Legumes (Lentils, dried beans, dried peas) [ ]

(c) Irish potatoes [ ]

(d) Green leafy vegetables [ ]

(e) Rice [ ]

(f) Meat [ ]

(g) Wheat products [ ]

(h) Cabbage [ ]

(i) Carrots [ ]

(j) Milk [ ]

(k) Eggs [ ]

(l) Chicken [ ]

(m) Vegetables [ ]

(n) Tomatoes [ ]

(o) Fruits [ ]

(p) Sweet potatoes [ ]

(q) Other (Specify)……

22. ***Here ask the respondent to rank the foods eaten most beginning with number 1, which is the food eaten more than the others then ask the following question?*** On average, how many times in a week do you eat? *Kwa wiki moja huwa unakula chakula hiki kama mara ngapi*

(a) Food_____Number of times in a week food is eaten in a week ____

(b) Food_____Number of times in a week food is eaten in a week _____

(c) Food_____Number of times in a week food is eaten in a week ____

23. Please tell me the reasons that makes you eat these foods more regularly than others. *Ni kwa sababu ipi huwa unakula hivi vyakula zaidi ya vingine*?

(a) Personal preference [ ]

(b) Food more available in the locality [ ]

(c) Food preferred by the community [ ]

(d) Food craving [ ]

(e) Family preference [ ]

(f) Cost of the food [ ]

(g) Food taboos [ ]

(h) Nutritional content [ ]

(i) Other (Specify)……

24. How many times in a week do you eat meat? *Je, kwa wiki moja huwa unakula nyama a. kama mara ngapi?*_____***(Indicate number of times)***

b. Don't like meat [ ]

25. How many times in a week do you eat eggs? *Huwa unakula mayai mara ngapi kwa wiki?*

a. _____***(Indicate number of times)***

b. Don't like eggs [ ]

26. How many times in a week do you eat green leafy vegetables? *Ni mara ngapi kwa wiki huwa unakula mboga ya majani ya kijani?*.....

27. How many times in a week do you fruits? *Ni imara ngapi kwa wiki huwa unakula matunda*……

28. Are there some foods that you would like to eat more regularly but you don't? *Je kuna vyakula vingine ungependa kula mara kwa mara zaidi lakini huwezi kula?*

(a) Yes [ ]

(b) No **(Go to Q 30)** [ ]

29. Please list three of the foods you would like to eat more often but don't. *Hebu niambie vyakula vitatu ambavyo ugependa kuwa unakula zaid mara kwa mara lakini huwezi?*

a……

b……

c……

30. Please list the reason you do not eat these foods as often as you would want to: *Tafadhali niambie sababu yake.*

i) Food 1……

a. Cost of the food/Food is expensive [ ]

b. Food not easily available in the locality [ ]

c. Food not good during pregnancy/ Food taboos for pregnant mothers [ ]

d. Food not part of my culture [ ]

e. Other (Specify)……

ii) Food 2……

a. Cost of the food/Food is expensive [ ]

b. Food not easily available in the locality [ ]

c. Food not good during pregnancy/ Food taboos for pregnant mothers [ ]

d. Food not part of my culture [ ]

e. Other (Specify)……

iii) Food 3……

(a) Cost of the food/Food is expensive [ ]

(b) Food not easily available in the locality [ ]

(c) Food not good during pregnancy/ Food taboos for pregnant mothers [ ]

(d) Food not part of my culture [ ]

(e) Other (Specify)……

31. Is cost of food a consideration in your choice of food? *Je, chaguo lako la chakula huwa linategemea bei chakula huwa kinauzwa?*

(a) Yes [ ]

(b) No [ ]

32. Is culture a consideration in your choice of food? *Na je, chaguo lako la chakula huwa linategemea tamaduni?*

(a) Yes [ ]

(b) No [ ]

33. Do people in your community discourage women from eating certain foods during pregnancy? *Je, kwa jamii yako watu huwa wanahimiza wanawake wajawazito kutokula vyakula vingine?*

(a) Yes [ ]

(b) No **(Go to Q39)** [ ]

34. If yes, which ones? *Ni vykula vipi hivyo?*

a) Food 1……

b) Food 2……

c|) Food 3……

35. What are the reasons are given for discouraging the foods? *Ni zababu zipi jamii hutoa kwa hii?*

i) Food 1

(Tick all that are mentioned)

a. Baby will become too big/difficulties during delivery [ ]

b. Food will harm the baby [ ]

c. Food will harm the mother [ ]

c. Other (Specify)…….

ii) Food 2

a. Baby will become too big/difficulties during delivery [ ]

b. Food will harm the baby [ ]

c. Food will harm the mother [ ]

c. Other (Specify)…….

iii) Food 3

a. Baby will become too big/difficulties during delivery [ ]

b. Food will harm the baby [ ]

c. Food will harm the mother [ ]

c. Other (Specify)……..

36. Since you conceived do you make an effort to eat a more nutritious diet? *Tangu uwe mjamzito, umekuwa ukila vyakula vingi ambavyo vina virutubisho*

(a) Yes [ ]

(b) No [ ]

SECTION C: SOCIOECONOMIC STATUS

37. On average what is your monthly household in Kenya shillings? *Familia yako hupata kama pesa ngapi kwa mwezi moja?*

(a) Less than 3,000 [ ]

(b) 3,001-6,000 [ ]

(c) 6,001-9,000 [ ]

(d) 9,001-13,000 [ ]

(e) 13,001-18,000 [ ]

(f) 18,001-22,500 [ ]

38. Does your household have any of these items? *Je kwa familia yako kuna:*

(Please read list and tick every item that is mentioned)

(a) Electricity (*Stima)* [ ]

(b) Radio [ ]

(c) Television *(Televisheni)* [ ]

(d) Mobile telephone [ ]

(e) Refrigerator *(Friji)* [ ]

(f) *Microwave* [ ]

(g) Solar panel [ ]

(h) Sofa [ ]

39. How many of these animals does this household own? *Je familia yako ina wangapi wa hawa wanyama?* (***Please read list and indicate number)***

(a) Cows *(ngombe*)……

(b) Goats (*Mbuzi*)……

(c) Sheep (*Kondoo*) ……..

(d) Chicken (*Kuku*)……

(e) Ducks (*bata*)……

40. Does any member of your household own: *Je kuna mtu kwa familia yako ambaye ako na*:

A car/truck *(gari/lori)* [ ]

(a) Motorcycle (*pikipiki*) [ ]

(b) Bicycle (*baiskeli*) [ ]

(c) Tractor [ ]

41. Do you own the house you live in or do you pay rent? *Je ile nyumba ambayo unaishi ni yako ama wewe hulipa kodi?*

(a) Own [ ]

(b) Pay rent [ ]

(c) Live with parents/relatives [ ]

(d) Other (specify)……

SECTION D: KNOWLEDGE

42. Please tell me some of the food groups you know and the nutrients they provide to the body. *Tafadhali niambie aina ya vyakula ambavyo unajuo na ile virutubisho zinapatia mwili:*

(a) Grains…….

(b) Vegetables……...

(c) Fruits……

(d) Meat, fish, and beans……

(e) Milk ……

43. Which effect does the food have on human health***?*** *Je, chakula kina adhari ipi kwa afya ya binadamu? (**Tick all which are mentioned)***

(a) Prevention of diseases [ ]

(b) Prevention of malnutrition [ ]

(c) Building of muscles [ ]

(d) Boosting blood levels [ ]

(e) Longevity of life [ ]

(f) Other (Specify)……

(g) Don't know [ ]

44. Which people in the population require more of certain foods? *Ni watu wapi wanahitaji zaidi ya vyakula fulani?*

(a) Women of reproductive age [ ]

(b) Pregnant women [ ]

(c) Lactating mothers [ ]

(d) Children below 5 years [ ]

(e) The elderly [ ]

(f) Women [ ]

(g) Other (Specify)……

(h) Don't know [ ]

45. Pregnant women should eat more of certain foods? Which are these foods? *Wanawake wajawazito wanapaswa kula zaidi ya vyakula fulani? Je! Ni vyakula vipi hivi?*

(a) Iron-rich foods (green leafy vegetables, beans, peas, cowpeas) [ ]

(b) Vitamin C rich foods (Fruits) [ ]

(c) Calcium-rich foods (Lean meats: liver, kidney; daily products, fish [ ]

(d) Don't know [ ]

(e) Other (Specify)…….

46. Why do pregnant women require to eat more of these foods? *Ni kwa sababu zipi wanawake wajawazito wanahitajika kula zaidi ya vyakula hivi? (**Tick all that are mentioned)***

(a) They lose blood during childbirth [ ]

(b) Ensure the baby is well nourished [ ]

(c) To avoid complications during childbirth [ ]

(d) Other (Specify)……

(e) Don't know [ ]

47. When was the last time you received nutrition education/information? *Ni lini mara ya mwisho ulipata elimu/taarifa ya lishe?*

(a) 0-1 week ago [ ]

(b) One month ago [ ]

(c) 3. 1-6 months ago [ ]

(d) More than 6 months ago [ ]

48. What was the source of your information/education? *Ulipata wapi hii elimu/taarifa?*

(a) Trained health worker [ ]

(b) Community health worker/Community Health Volunteer [ ]

(c) Read from publication (book, brochure, pamphlets) [ ]

(d) Other (Specify)……

INTERVENTIONS

49. What is being done in your community to help women improve their dietary habits and nutrition status? *Ni nini inafanyika katika jamii yako kusaidia wanawake kuboresha tabia zao za chakula na hali ya lishe?*

(a) Nutrition education and counselling [ ]

(b) Vitamin and mineral supplementation [ ]

(c) Food fortification [ ]

(d) Other (Specify)……

50. Do pregnant women receive nutrition education and counselling when they visit the ANC clinic in this health facility? *Je! Wanawake wajawazito wanapata elimu ya lishe na wakati wanatembelea kliniki ya ANC katika kituo hiki cha afya?*

a. Yes [ ]

b. No [ ]

c. Don't know [ ]

51. Did you receive nutrition education and counselling at this facility today? *Je wewe ulipata elimu ya lishe leo?*

a. Yes [ ]

b. No [ ]

52. Do pregnant women receive nutrition supplements when they visit the ANC clinic in this health facility? *Je! Wanawake wajawazito wanapata hupata virutubisho vya lishe wakati wanapembelea kliniki ya ANC katika kituo hiki cha afya?*

a. Yes [ ]

b. No [ ]

c. Don't know [ ]

53. Did you receive nutrition supplements at this facility today? *Je, wewe ulipata virutubisho vya lishe leo?*

a. Yes [ ]

b. No [ ]

54. In your opinion, what should be done to help pregnant women in your community improve their dietary habits and nutritional status? *Kwa maoni yako, nini kinahitajika kufanywa kusaidia wanawake wajawazito kuboresha tabia zao za chakula na hali ya lishe?*

Probe:

- At the facility level/*Kwa vituo vy afya*
- At the community level/*Kwa jamii*
- Any other?/*Mahali pengine popote?*
- Who should be involved?

……

……

55. Is there anything else you would like to say about the issue we have been talking about? *Je, kuna kitu kingine chochote ungependa kusema kuhusiana na suala tumekuwa tukizungumzia?*

……

……

Dietary Diversity Questionnaire

Now I would like to ask you to describe the foods that you ate or drank yesterday during the day and night, whether you ate them at home or outside the home. Please include all foods, drinks, any snacks or small meals, as well as any main meals. Please start with the first food or drink and

remember to include all foods you may have eaten while preparing meals or preparing food for others. I would like us to start with the first food or drink consumed yesterday. *Sasa ningetaka kukuuliza unielezee vile vyakula ulikula jana mchana na usiku, hata kama ulikula nyumbani au mahali pengine nje ya numabani. Tafadhali taja vyakula vyote, vinyawaji, vitafunio vyovyote, vyakula vidogo na vyakula vikuu vyovyote. Tafadhali anza na kile chaukula ou kinywaji cha kwanza ulikula au kunywa na ukumbuke vyakula unawezakuwa ulikula ukipika au kupikia wengine. Ningetaka tuaanze na kile chakula au kinywaji cha kwanza ulikula/kunywa jana.*

1. Did you eat or drink anything when you woke up yesterday? (If yes) What was it? Anything else? *Je, ulikula au kunywa kitu chochote ulipoamka jana? (Kama ndio) Je, kilikuwa kitu gani? Je, kuna kitu kingine*?
2. Did you eat or drink anything later in the morning? (If yes) What was it? Anything else? *Je, ulikula au kunyua kitu chochote baadaye asubuhi? (Kama ndio) Je, kilikuwa kitu gani? Je, kuna kitu kingine?*
3. At around at mid-day did you eat or drink anything? (If yes) What was it? Anything else? *Je, ulikula au kunywa kitu chochote mchana? (Kama ndio) je, kilikuwa kitu gani? Je, kuna kitu kingine?*
4. Did you eat or drink anything during the afternoon? (If yes) What was it? Anything else? *Je, ulikula ua kunyua kitu chochote wakati wa adhuhuri? (kama ndio) je, kilikuwa kitu gani? Je, kuna kitu kingine?*
5. Did you eat or drink anything in the evening? (If yes) What was it? Anything else? *Je, ulikula au kunyua kitu chochote jioni? (Kama ndio) Je, kilikuwa kitu gani? Je, kuna kitu kingine?*
6. Did you eat or drink anything else in the evening before going to bed or during the night? (If yes) What was it? Anything else? *Je, ulikula au kunyua kitu kingine jioni kabla ya kwenda kitandani au usiku? (Kama ndio) Je, kilikuwa kitu gani? Je, kuna kitu kingine?*

Breakfast	Snack	Lunch	Snack	Dinner	Snack

Fill in the food groups based on the information provided above. Once the respondent completes the recall, please ask her if any item from the unmentioned food groups were consumed.

Question number	Food group	Examples	Yes=1 No=2
1	CEREALS	Maize, rice, wheat, sorghum, millet, or any other grains or foods made from these (e.g. bread, noodles, spaghetti, porridge, or other grain products), insert local foods githeri, ugali, porridge	
2	WHITE ROOTS AND TUBERS	white potatoes, white yam, white cassava, or other foods made from roots	
3	VITAMIN A RICH VEGETABLES AND TUBERS	Pumpkin, carrot, or sweet potato that are orange inside and other locally available vitamin A-rich vegetables	
4	DARK GREEN LEAFY VEGETABLES	Dark green leafy vegetables, including wild forms and locally available vitamin A rich leaves such as amaranth, kale, spinach	
5	OTHER VEGETABLES	Other vegetables (e.g. tomato, onion, eggplant, courgettes) and other locally available vegetables	

6	VITAMIN A RICH IN FRUITS	Ripe mango, apricot, ripe papaya, and 100% fruit juice made from these and other locally available vitamins A-rich fruits	
7	OTHER FRUITS	Other fruits, including wild fruits and 100% fruit juice made from these	
8	ORGAN MEAT	Liver, kidney, heart, or other organ meats or blood-based foods	
9	FLESH MEATS	Beef, pork, lamb, goat, rabbit, game, chicken, duck, other birds, insects	
10	EGGS	Eggs from chicken, duck, or any other egg	
11	FISH AND SEAFOOD	Fresh or dried fish or shellfish	
12	LEGUMES, NUTS, AND SEEDS	Dried beans, dried peas, lentils, nuts, seeds, or foods made from these (eg. peanut butter)	
13	MILK AND MILK PRODUCTS	Milk, cheese, yogurt, or other milk products	
14	OILS AND FATS	Oil, fats, or butter added to food or used for cooking	
15	SWEETS	Sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies, and cakes	
16	SPICES, CONDIMENTS, BEVERAGES	Spices (black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, alcoholic beverages	
	Did you eat anything (meal or snack) outside the home yesterday?		

The interview has now come to an end. Many thanks for the time you have taken. Sasa tumemaliza mahojiano. Ahsante sana kwa muda wako

Aggregation of food groups from the questionnaire to create WDDs

Question number(s)	Food group
1,2	Starchy staples
4	Dark green leafy vegetables
3,6	Other vitamins A-rich fruits and vegetables
5,7	Other fruits and vegetables
8	Organ meat
9,11	Meat and fish
10	Eggs
12	Legumes, nuts, and seeds
13	Milk and milk products

Calculation of WDDS for the woman

Starchy samples	Dark green leafy vegetables	Another vitamin A-rich fruits and vegetables	Other fruits and vegetables	Organ meat	Flesh meat	Eggs	Legumes/Nuts	Milk and milk products	WDDS

Hb level_____ MUAC recording_____ Gestation of pregnancy (in weeks) _____

APPENDIX III: FOCUS GROUP DISCUSSION GUIDE

DIETARY HABITS AND NUTRITIONAL STATUS OF PREGNANT WOMEN: A STUDY OF PREGNANT WOMEN SEEKING ANC SERVICES IN OTHAYA CONSTITUENCY, NYERI COUTY IN KENYA

FOCUS GROUP DISCUSSION WITH PREGNANT WOMEN

Dietary habits

1. Tell us the foods are available in this Constituency (grains, fruits, vegetables, meat). Hebu tuelezee vile vykula hupatikana huku?

Probe:

- Which fruits are available? *Matunda yanayopatikana*
- Which vegetables are available? *Mboga mboga zinazopatikana*
- Which foods are produced in the Constituency? *Ni vyakula vipi hupakitana huku*
- Which foods come from other parts of the country? *Ni vyakula vipi hutoka sehemu zingina za nchi*

2. Tell us whether people in this constituency MAINLY produce or buy food for their consumption. *Watu katika hii Eneo Mbuge kwa kawaida hukuuza chakula kile wanakula ama huwa wananunua?* **Probe**:

- What proportion of the population can produce enough food for themselves? *Ni watu kiwango gani ambao hukuuza chakula cha kuwatosha*
- Is there a surplus? *Kuna chakula ambalo hubaki?*
- On average what is the size of land used for producing food? *Kwa kawaida ni kipi kiwango cha shamba?*
- What happens to the surplus (are people able to sell the surplus to earn an income)? *Ni ni hufanyika kwa kile chakula hubaki? Je watu wanaweza kuuza na kupata mapato*?
- What proportion of the population has surplus food to sell? *Ni kiwango kipi cha watu huweza kupata chakula cha kubaki na wanauuza?*
- Availability of cows in the household, goats, chicken. *Watu wana mifugo*
- The number of animals available. *Idadi ya wanyama ambayo hupatikana*

3. Which foods do people in this constituency MAINLY eat? *Watu katika hii Eneo Mbunge kwa kawaida wanakula vyakula vipi?* **Probe**:

- Types of food: fruits, green leafy vegetables, milk, meat, beans, maize and maize products, potatoes, wheat and wheat products, chicken, eggs. *Matunda, mboga za majani za kijani, nyama, mahindi na bidhaa za mahindi, ngano na bidhaa za ngano, kuku, mayai*
- How often are these foods eaten? On average how many times a week are these foods eaten? *Hivi vyakula huwa zinaliwa kama mara ngapi kwa wiki?*
- Source of food (whether grown in the area or comes from outside the area) *Hivi vykula hukoka wapi? Vinakuzwa huku ama hutoka nje?*

4. Please tell us the factors which are taken into consideration when the food choice is made? *Ni mambo yapi hutiliwa maanani wakati uamuzi wa chakula unapofanywa?* **Probe**:

- cost of food,/*bei ya chakula*
- ease of availability/ *kupatika kwa urahisi*
- food likes/*vile chakula kinapendeka*
- culture/tamaduni
- nutritional content/ *maudhui yalishe*

5. Would people in the Constituency be willing to embrace new foods?/*Je watu katika hili Eneo Mbunge wanaweza kukubali vyakula vingine mpya?* ***If yes, Probe***

- Which foods/*Vyakula vipi*
- Reasons/*Sababu*
- If there have been efforts to introduce other types of food in the area/*Kumekuwa na juhudi ya kulete vyakula aina ingine katika hili eneo?*
- What was the reaction to this introduction/*Watu walichukulia aje?*

6. Are there some groups of people in the population who have special nutritional requirements? Je, kuna watu katika jamii ambao wana *mahitaji maalum ya lishe*

Probe:

- children below the age of five years, pregnant women, lactation women, teenage girls, women of reproductive age/ *watoto chini ya miaka mitano, wanawake wajawazito, wanawake wanaonyonyesha, wanawake wa wa umri wa uzazi watoto*
- Tell us the reasons why these people have higher nutritional needs/ *Ni kwa nini hawa watu wanahitaji lishe bora zaidi?*

7. Please tell us the foods that pregnant women in this constituency MAINLY eat? *Wanawake katika hili eneneo Mbunge huwa wanakula vyakula vipi*? ***Probe***

Foods: including fruits and vegetables, how often are the foods eaten in a week/ *matunda, mboga. Wanakula hivi vyakula kama kwa wiki?*

Factors that influence food choice: *Mambo ambayo huchangia uchanguzi wa chakula*

- cost of food, /bei ya chakula
- ease of availability, / kupatikana kwa urahisi
- food likes, /Kupendeka kwa chakula
- culture /Tamaduni
- Nutritional content/maudhui yalishe

8. Does the community restrict pregnant women from eating certain foods during pregnancy? /*Je jamii huwashawishi wanawake wajawazito kutokula vyakula fulani?* If yes, **Probe**:

- which are these foods, /*Ni vyakula vipi hivyo*
- reason for women being discouraged/*sabubu wanawake wajawazito kushawishiwa wasile*

9. Could you tell me about any traditional beliefs and practices related eating during pregnancy? *Je, ungependa kuniambia kuhusu imani na jadi yoyote zinazohusiana na kula wakati wa ujauzito?*

10. Are women in this Constituency eating sufficient food to address their nutritional needs? Why? *Je, wanawake katika hili Eneo Mbunge hula chakula cha kutosha kuchangia mahitaji yao ya lishe?*

11. What are the barriers to women eating nutritious foods in Othaya Constituency?/*Je, ni vipi vizuizi vya wanawake wajawazito kuna vyakula ambavyo vina lishe bora?*

Knowledge

12. Do pregnant women in the community have sufficient nutrition knowledge? Please explain. *Je, wanawake wajawazito katika hii jamii wana habari ya lishe ya kutosha?*

13. Do pregnant women in this Constituency know the various types of food groups? *Wanawake katika hii jamii wanaelewa kuhusu aina ya vyakula* ***Probe***

- Tell us the different food groups the food groups/*Tueelezeni kuhusu aina ya vyakula*
- Tell us the nutrients and that you know of/*Tueelazeni virutubisho ambavyo mnajua*
- Which foods produce these nutrients?/*Ni vyakula vipi hupena hizi virutubisho*

14. Please tell us where pregnant women get information/education on nutrition?/*Wanawake wajawazito hupata wapi habari au elimu kuhusu lishe?* ***Probe:*** What is their source of information?

- School/*Shule*
- Radio
- Heath facility/*Kituo cha afya*
- Community health worker who visit homes/*Wafanya kazi wa afya wa jamii ambo hutambea nyumabani*

Interventions

15. Please tell us what is being done to help pregnant women improve their dietary habits and nutritional status/*Tafadhali tueelezeni ni nini inafanyika kusaidia wanawake wajawazito kuboresha tabia zao za chakula na kisha hali yao ya lishe.* **Probe**:

- Nutrition education at facility level/*wanapewa masomo juu ya lishe kwa vituo vya afya*
- Nutrition education at community level/ *wanapewa masomo juu ya lishe katika jamii*

16. In your opinion what else needs to be done to address dietary habits and nutritional status of pregnant women in your community?/*Kwa maoni yako ni nini ingine inafaa kufanywa ili kushugulikia vile wanawake wajawazito wanavykula na pia hali yao ya lishe?* **Probe:**

- At the facility level/*Kwa vituo vy afya*
- At the community level/*Kwa jamii*
- Any other?/*Mahali pengine popote?*
- Who should be involved? /*Nani anafaa kushiriki?*

17. Is there anything else you would like to tell use regarding the topic we have been discussing?/*Kuna kitu ingine yoyote ungetaka kutuelezea kuhuzu hili suala tumekuwa tukizungumzia?*

APPENDIX IV: INTERVIEW WITH KEY INFORMANTS

DIETARY HABITS AND NUTRITIONAL STATUS OF PREGNANT WOMEN: A STUDY OF PREGNANT WOMEN SEEKING ANC SERVICES IN OTHAYA CONSTITUENCY, NYERI COUNTY, IN KENYA

Interview with Key Informants: ***(Respondents will include County RH coordinator, County Nutrition Coordinator, Sub-County RH coordinator, Sub-County Nutrition Coordinator, Health providers in charge of the four health facilities)***

Date of interview:	
Title of respondent:	
Name of health facility: ***(if working at facility level)***	
Sex of respondent:	
Language of discussion:	
Location of interview:	
Interviewer's name:	
Note taker's name:	
Time interview began:	Time interview ended:

Background Information

1. Please tell me about your education and the number of years of experience as….**Probe**
    - Length of time respondent has worked in the County/Sub-County/facility
    - Length to time respondent has held current position
2. What are the main services you provide to your clients? **Probe**:
    - What is your role in addressing maternal nutrition
    - Do you directly serve pregnant mothers
3. As a health worker, what role do you play in helping pregnant women eat the right foods?
4. Have you received training on nutrition during pregnancy? If yes, when was the last time you received training on maternal nutrition?

Dietary habits

5. Please tell me the foods that are available in Othaya. **Probe**
    - Fruits: Which ones

- Daily products
- Vegetables: Which ones
- Grains: Maize, Legumes
- Which of these foods are grown in the constituency?

6. Do people in the Constituency produce enough food for their consumption? Please explain. **Probe**:

- What is the main source of the food that people in the constituency consume?

7. Please tell us the foods that people in the Constituency mainly consume. What are the reasons? Are there foods that people do not like?

8. What about pregnant women? Which foods do they mainly consume? What are the reasons?

9. Does the community have any food restrictions for pregnant women? If so, which foods? What are the reasons?

10. Could you tell me about any traditional beliefs and practices related to eating during pregnancy?

Knowledge on nutrition

11. Do you think pregnant women in the constituency have adequate knowledge of nutrition? Please explain.

12. What is the source of nutrition knowledge for pregnant women in the Constituency? **Probe**: media, health facility, community health workers. Does this knowledge aid them in making food choices?

13. In your opinion, do pregnant women in the constituency consume a diet that is adequate to meet their nutritional needs? Please explain

14. What are the barriers to pregnant women in Othaya Constituency eating nutritious foods?

15. What is the nutritional status of pregnant women?:

- In the County
- In Othaya Constituency
- In the health facility's catchment population (for those in charge of health facilities)

16. In your opinion which factors influence their nutritional status? Probe:

- Eating practices
- Nutrition supplementation
- Food fortification

Interventions

I would now like us to talk about the interventions which are in place to address the dietary habits and nutritional status of pregnant women in the Constituency

17. Please tell me what is being done to address the dietary habits and nutritional status of pregnant women. **Probe**: Nutrition education and counselling, food fortification, nutrition supplementation National

- At the County level,
- Sub-County level,
- Facility level,
- Community-level
- For nutrition supplementation: **Please probe which supplements are given and why**?
- For each of the interventions please tell us who is responsible for implementation.

18. Are there development partners working in the Constituency to address maternal nutrition? **Probe**: Names, activities being undertaken

19. In your opinion, are these interventions sufficient in addressing maternal nutrition? Please explain?

20. In your opinion, what else needs to be done to address maternal dietary habits and nutritional status?

- At the county level
- At the Sub-County level
- At the facility level
- At the community level
- Any other?
- Who should be involved?

21. Now we have reached the end of the interview. Do you have anything else you would like to say regarding what we have been discussing?

APPENDIX V: INFORMED CONSENT WITH PREGNANT WOMEN (ENGLISH VERSION)

DIETARY HABITS AND NUTRITIONAL STATUS OF PREGNANT WOMEN: A STUDY OF PREGNANT WOMEN SEEKING ANC SERVICES IN OTHAYA CONSTITUENCY, NYERI COUNTY, IN KENYA

INFORMED CONSENT WITH PREGNANT WOMEN (ENGLISH VERSION)

Informed consent and information sheet: Interview with pregnant women

A copy of this sheet that contains the information will be issued to you.

My name is _____, I am working on a research being conducted by Eugenia King'ori who is a student of the University of Nairobi and conducting this study as part of her Master's degree qualification. /My name is Eugenia King'ori, a student from the University of Nairobi. I am carrying out a study as part of my qualification for my Master's degree at the University. Approval to conduct this research has been sought and received from the Kenyatta National Hospital-University of Nairobi Ethics and Research Committee. It also has the approval from the Nyeri County Government Ministry of Health.

You are being invited to take part in this study, named "*Dietary Habits and Nutritional Status of Pregnant Women: A Study of Pregnant Women Seeking ANC Services in Othaya Constituency, Nyeri County, in Kenya*". I will give you information concerning this research. Please ask me questions if there is anything that is not clear, or if you would like more information. It is important before you are given more information concerning the study, for you to take note of the fact that: your taking part is voluntary; you have the freedom to ask questions to get a full understanding of the study before agreeing to get involved, you will not be penalized/ and you will continue receiving care from this health facility even/ if you decide to stop the study at any time. A signed copy of this form will be given to you to take with you.

Purpose of the study

The purpose of this study is to: i) assess the nutritional status of pregnant women in Othaya Constituency making their first ANC visit during their current pregnancy, ii) establish the dietary habits of pregnant women in Othaya Constituency, iii) determine the factors influencing dietary habits among pregnant women in Othaya Constituency, iv) examine the role of dietary knowledge

on the dietary habits and nutritional status of pregnant women Othaya Constituency making their first ANC visit during their current pregnancy and v) identify and document existing strategies which address the dietary habits and nutritional status of pregnant women in the Constituency.

If I become a participant, what will happen*?*

In case you accept to participate in the study, questions will be asked to you about yourself, the foods you eat and what determines your choice of food, your dietary knowledge, and the interventions that are in place in Othaya Constituency to address dietary habits and nutritional status of pregnant women.

It will take about 45-60

Risks

What are the risks of the study?

According to our thinking, there will be no serious risks to you during the study. You may, however, be the risk of experiencing some discomfort when answering some questions concerning your personal questions in life such as questions on your income and your dietary habits.

Benefits

What benefits are there in participating?

No direct benefits will be available to you for your participation in the study. You may gain an indirect benefit from knowing that you took part in an essential study that could help other women in the future. An additional, benefit is in you learning more about your nutritional status.

Compensation

You will not be compensated for your participation in this study.

Confidentiality

Information collected during the interview will be privately stored. The final report will use the information we receive from you, but we will not use your name. Every effort will be made by the study team to maintain the confidentiality of all the information that you give. To identify

you, a code will be assigned to you, and personal information gathered from the interview will be kept private.

Voluntariness

What are my rights as a participant?

Your participation in this study is completely voluntary. If you decide not to participate, there nothing bad will happen. If you agree to participate, you may end your participation at any time without penalty and it will not in any way affect the services you receive at this facility. If you decide to take part, you are free not to answer any questions that you do not want to. You have the freedom too to terminate the interview at any stage.

Further Information

There is no money given for participating in the research.

What will happen to the results of the research study?

The results of the study will be made into a written report, could be published in a journal to share with other people.

What if I am in need of more information?

If you have a concern about any aspect of the study, please contact Eugenia King'ori, (email: kingorie@gmail.com/ mobile: 0723-498220). If you have any questions about this research study and would like to talk to someone, else you are encouraged to contact Kenyatta National Hospital-University of Nairobi Ethics and Research Committee

P O BOX 20723 Code 00202, (254-020) 2726300 Ext 44355, Email: uonknh_erc@uonbi.ac.ke

Je nikihitaji ujumbe zaidi? Iwapo una swali lolote kuhusu utafiti huu, Tafadhali wasiliana na Eugenia King'ori, (email: kingorie@gmail.com/ mobile: 0723-498220*). Iwapo una swali lolote kuhusu utafiti huu na unahitaji kuwasiliana na mtu mwingine, unaweza wasiliana na Kamati ya Maadili na Utafiti ya Hospitali ya Kenyatta-Chuo Kikuu cha Nairobi* P O BOX 20723 Code 00202, (254-020) 2726300 Ext 44355, Email: uonknh_erc@uonbi.ac.ke

Have you any questions concerning this study and your involvement in it?

Declaration of participant

I give my consent for me to be included in the study entitled "*Dietary Habits and Nutritional Status of Pregnant Women: A Study of Pregnant Women Seeking ANC Services in Othaya Constituency, Nyeri County, in Kenya*". I confirm that I understand this study's purpose including that which will be needed of me if I participate. The benefits and the risks have already been clarified to me. The questions that I had in relation to the research have been sufficiently responded to. I have the understanding that if I wish to leave the study, I am free to do so any moment without any penalty. I voluntarily give my consent to take part in this research.

I have accepted to be interviewed ☐

OR

Signature/*Sahihi* …….Date/*Tarehe* ……

APPENDIX VI: INFORMED CONSENT WITH PREGNANT WOMEN (KISWAHILI VERSION)

DIETARY HABITS AND NUTRITIONAL STATUS OF PREGNANT WOMEN: A STUDY OF PREGNANT WOMEN SEEKING ANC SERVICES IN OTHAYA CONSTITUENCY, NYERI COUNTY, IN KENYA

INFORMED CONSENT WITH PREGNANT WOMEN (KISWAHILI VERSION)

Utapatiwa nakala ya ujumbe huu

KUJITAMBULISHA

Hujambo? Kwa jina naitwa_____na ninafanya kazi katika untafiti unaofanya na Eugenia King'ori ambaye anasoma chuo kikuu cha Nairobi. Anafanya huu utafiti kama sehemu ya masomo yake ka shahada ya Master's. Mimi ninaitwa Eugenia King'ori na ni mwanafunzi katika chuo kikuu cha Nairobi.Ninafanya utafiti huu kama sehemu ya shahada ya Master's. Huu utafiti una ithini ya Kamati ya Maadili na Utafiti ya Hospitali ya Kenyatta-Chuo Kikuu cha Nairobi. Pia una ithini na Wizara ya Seriakali ya Kauti ya Nyeri.

Umealikwa kujihusisha na utafiti huu unaoitwa utafiti kuhusu "Tabia za Kula na Hali ya Lishe ya Wanawake Wajawazito: Utafiti kati ya wanawake wajawazito wanopata huduma za wajawazito Eneo Mbunge la Othaya nchini Kenya". Kabla ya kuhusishwa tungependa uelewe sababu ya utafiti huu na itahusisha nini. Tafadhali chukua muda kusoma ama kusikiza taarifa ifuatayo. Tafadhali niulize chochote ambacho huelewi ama iwapo unahitaji ujumbe zaidi.Ukishajibiwa maswali yako yote na umeelewa kuhusu utafiti huu, utaulizwa kama ungependa kushiriki, unieleze kwa sauti kama umekubali kuhojiwa. Kabla Kujua zaidi kuhusu utafiti huu ni muhimu kujua kwamba: kuhusika kwako ni kwa hiari; Una uhuru wa kuuliza maswali yoyote ili uelewe utafiti huu kabla ya kushiriki; hakuna adhabu yoyote iwapo utaamuwa kusitisha kujihusisha kwako kwenye utafiti huu wakati wowote. Utapewa nakala ya fomu hii iliyo na sahihi.

Lengo la utafiti huu

Utafiti huu unahusu nini?

Huu utafiti una lengo la: i) Kutathmini hali ya lishe ya wanawake wajawazito wanaohudhuria kliniki ya wajawazito katika Eneo Mbunge la Othaya kwa mara ya kwanza katika ujauzito wa sasa, ii) kuchunguza tabia za lishe za wanawake wajawazito katika eneo mbunge la Othaya iii)

kuchunguza sababy zinazoshawishi tabia ya lishe kati ya wanawake wajawazito katika Jimbo la Othaya iv) kutathmini ushawishi wa ujuzi wa chakula kati ya wanawake wajawazito juu ya tabia zao za chakula na hali ya lishe v) kuchunguza mikakati iliyopo ambayo hushughulikia tabia ya lishe na hali ya lishe ya wanawake wajawazito katika eneo mbunge la Othaya.

Kwa nini nimealikwa kushiriki?

Umealikwa kushiriki kwa sababu sababu unatafuta huduma za ANC katika kituo hiki cha afya kwa mara ya kwanza wakati wa ujauzito huu. Kwa kukuhoji wewe na wanawake wengine kama wewe, tutaelewa kuhusu wanawake wajawazito katika Eneo Mbunge hili, tabia zao za chakula, sababu zinazochangia chakula chao, ujuzi wao wa chakula na hali yao ya lishe.

Ni nini itafanyika nikishiriki?

Ukikubali kushiriki kwenye utafiti huu, utaulizwa maswali kukuhusu, vyakula unavyokula na kile kinachovhangia uamuzi wako wa chakula, ujuzi wako wa lishe na hatua zinazowekwa katika Eneo Mbuge la Othaya kwa kushughulikia tabia za chakula na hali ya lishe ya wanawake wajawazito. Pia vipimo vyako vya damu na mkono vitachukuliwa kutoa rekodi za hospitali.

Mahojiano yatachukua muda gani?

Itachukua muda wa dakika 45-60.

Risks/Madhara

Madhara ya utafiti huu ni yapi?

Sidhani kama kuna hatari kubwa kwako wakati wa utafiti huu. Walakini, kunaweza kuwa na hatari ya kupata usumbufu wakati wa kujibu maswali kadhaa kuhusu maisha yako ya maswali kama maswali juu ya mapato yako na tabia yako ya lishe.

Faida

Hakuna faida za moja kwa moja kwako kwa kushiriki katika utafiti. Unaweza kupata faida isiyo ya moja kwa moja kwa kujua umeshiriki kwenye utafiti muhimu ambao unaweza kusaidia wanawake wengine katika siku zijazo. Pia, utafaidika kutokana na kujifunza zaidi juu ya hali yako ya lishe.

Fidia

Hautalipwa fidia kwa ushiriki wako katika utafiti huu.

Usiri

Je kuhusika kwangu kutakuwa siri?

Tutaweka kwa siri ujumbe wowote unaokusanywa wakati wa mahojiano haya. Tutatumia ujumbe wowote kutoka kwako kuandika ripoti yetu ya mwisho lakini jina lako halitahusishwa. Watafiti wataweka juhudi kuhakikisha siri ya ujumbe wowote utakao tupatia. Utajulikana kwa kutumia alama /nambari ya siri na ujumbe wako wa kibinafsi hauta tolewa kwa njia yoyote.

Uhiari

Je nina haki gani kwa kuhusika?

Kuhusika kwako ni kwa hiari. Iwapo hutaki kuhusika hakuna chochote kibaya kitatokea. Iwapo utakubali kuhusika, unaweza tamatisha kuhusika kwako wakati wowote bila adhabu yoyote na haitaathiri kwa njia yoyote zile huduma wewe hutapata kwa kituo hiki cha afya. Iwapo utakubali kuhusika unaruhusiwa kutojibu swali lolote. Unaweza simamisha mahojiano haya wakati wowote.

Maelezo zaida

Je nitapokea nini kwa kuhusika? Hakuna malipo kwa kuhusika kwa utafiti huu.

Matokeo ya utafiti huu yatatumika kuandika ripoti, na kuchapishwa kwenye nakal.

Je nikihitaji ujumbe zaidi? Ikiwa una mswala yoyote kuhusu huu utafiti, tafadhali wasiliana na Eugenia King'ori, (email: kingorie@gmail.com/ mobile: 0723-498220). Iwapo una swali lolote kuhusu utafiti huu na unahitaji kuwasiliana na mtu mwingine, unaweza wasiliana na Kamati ya Maadili na Utafiti ya Hospitali ya Kenyatta-Chuo Kikuu cha Nairobi P O BOX 20723 Code 00202, (254-020) 2726300 Ext 44355, Email: uonknh_erc@uonbi.ac.ke

Je una maswali yoyote kuhusu utafiti huu na kuhusishwa kwako?

Azimio la mshirika:

Ninapeana ridhaa kuhusishwa kwangu katika utafiti huu utafiti kuhusu Tabia za Kula na Hali ya Lishe ya Wanawake Wajawazito: Utafiti kati ya wanawake wajawazito wanopata huduma za wajawazito Eneo Mbunge la Othaya nchini Kenya". Nafahamu lengo la utafiti huu na

kinachohitajika kutoka kwangu kwa kushiriki. Nimeelezwa madhara na faida. Nimejibiwa vya kutosha maswali yoyote kuhusu utafiti huu na ninafahamu kwamba niko huru kusitisha/kutoka huu utafiti wakati wowote bila adhabu. Ninapeana ridhaa/ Ninakubali kushiriki kwa hiari.

I have accepted to be interviewed/Nimekubali kuhojiwa (Weka alama kwas kijisaduku) ☐

Sahihi ……Tarehe ……

APPENDIX VII: INFORMED CONSENT WITH FOCUS GROUP PARTICIPANTS (ENGLISH VERSION)

DIETARY HABITS AND NUTRITIONAL STATUS OF PREGNANT WOMEN: A STUDY OF PREGNANT WOMEN SEEKING ANC SERVICES IN OTHAYA CONSTITUENCY, NYERI COUNTY, IN KENYA

INFORMED CONSENT WITH FOCUS GROUP PARTICIPANTS (ENGLISH VERSION)

A copy of this sheet that contains the information will be issued to you.

My name is _____. I am working on a research being conducted by Eugenia King'ori who is studying at the University of Nairobi and conducting this research as part of her Master's degree qualification./My name is Eugenia King'ori, a student from the University of Nairobi. I am conducting a study as part of my qualification for my Master's degree at the University. With me is _____ who will act as note taker. The approval to for this research has been sought and received from the Kenyatta National Hospital-University of Nairobi Ethics and Research Committee. It also has approval from the Nyeri County Government Ministry of Health.

You are being invited to take part in this study, named "*Dietary Habits and Nutritional Status of Pregnant Women: A Study of Pregnant Women Seeking ANC Services in Othaya Constituency, Nyeri County, in Kenya*". It is important before you are given more information concerning the study, you need to take note of the fact that: your taking part is voluntary; you have the freedom to ask questions to get a full understanding of the study before agreeing to get involved, and you will not be penalized if you decide to stop the study at any time.

Purpose of the study

What is the study about?

The purpose is to: i) assess the nutritional status of pregnant women in Othaya Constituency making their first ANC visit during their current pregnancy, ii) establish the dietary habits of pregnant women in Othaya Constituency, iii) determine the factors influencing dietary habits among pregnant women in Othaya Constituency, iv) examine the role of dietary knowledge on the dietary habits and nutritional status of pregnant women Othaya Constituency making their first

ANC visit during their current pregnancy and v) identify and document existing strategies which address the dietary habits and nutritional status of pregnant women in the Constituency.

You have been invited to take part because you are seeking ANC services at this health facility. By interviewing you, and other women like you, we will learn about pregnant women in this Constituency, their dietary habits, the factors that contribute to their choice of food, their dietary knowledge, and their nutritional status.

If I take part, what will happen*?*

If you give your approval to take part in the research, you will be requested to be a participant in a discussion that is expected to include about 8-10 participants. We shall discuss with you the foods people in your community eat and what determines their choice of food, their dietary knowledge, and the interventions that are in place in Othaya Constituency to address dietary habits and nutritional status of pregnant women. The discussion will be recorded on audio.

How long will the discussion last?

It will take about 60 minutes.

Risks/*Madhara*

What are the risks of the study?

We do not think there are any serious risks that you will be exposed to in the process of this study. It is not likely that any harm could occur to you due to your taking part in this study.

Benefits

What are the benefits of participating?

You will receive no direct benefits for participating in the study. There may be an indirect benefit that you find in knowing that you have taken part in an important study that could be of help to other women in the future. In addition, you will also benefit from learning more about your nutritional status.

Compensation

Apart from Kshs.300 that you will receive as travel reimbursement, there will be not remuneration for you for your participation in this research.

Confidentiality

Will involvement in the research be kept in confidence?

The information that is collected during the discussion will be kept private. The final report will use the information we receive from you, but we will not use your name. Every effort will be made by the study team to maintain the confidentiality of all the information that you give. Only a code will be used to identify you and no personal information from the discussion will be disclosed.

Voluntariness/*Uhiari*

As a participant, what rights do I have?

Your taking part in this study is entirely voluntary. If you make a decision not to get involved, nothing bad will happen to you. If you accept to take part, you are free to end your participation at any moment without being penalized and it will not in any way affect the services you receive at this facility. If you decide to participate, you have the freedom to decline to answer any questions that you may not want to answer. If you pull out from the discussion, you will still get to keep your travel allowance.

Additional Information/*Maelezo zaida*

What will I receive for participating*?* Aside from the travel allowance, there is no money given for participating in the research.

What will happen to the research findings? Findings from this study will be written into a report. They could and published in a journal to be shared with other people.

What there is more information that I require?

If you have a concern about any aspect of the study, please contact Eugenia King'ori, (email: kingorie@gmail.com/ mobile: 0723-498220). If you have any questions about this research study and would like to talk to someone, else you are encouraged to contact Kenyatta National Hospital-University of Nairobi Ethics and Research Committee P O BOX 20723 Code 00202, (254-020) 2726300 Ext 44355, Email: uonknh_erc@uonbi.ac.ke

Have you any questions concerning this study and your involvement in it??

Declaration of participant

I give my consent for you to include me in the study entitled "*Dietary Habits and Nutritional Status of Pregnant Women: A Study of Pregnant Women Seeking ANC Services in Othaya Constituency, Nyeri County, in Kenya*". I understand the purpose of the research and what will be required of me if I take part in it. The benefits and the risks have been clarified to me. Questions that I had regarding this study have been adequately addressed. It is clear to me that I can pull out of the research any moment in the event that that is my desire and I will not get a penalty for it. I voluntarily give my consent to take part in this research.

I have accepted to take part in the discussion (tick the box) ☐

OR

Signature…….Date……

APPENDIX VIII: INFORMED CONSENT WITH FOCUS GROUP PARTICIPANTS (KISWAHILI VERSION)

DIETARY HABITS AND NUTRITIONAL STATUS OF PREGNANT WOMEN: A STUDY OF PREGNANT WOMEN SEEKING ANC SERVICES IN OTHAYA CONSTITUENCY, NYERI COUNTY, IN KENYA

INFORMED CONSENT WITH FOCUS GROUP PARTICIPANTS (KISWAHILI VERSION)

Ridhaa ya maelezo: Mahojiano ya wanao wanawake wajawazito

Utapatiwa nakala ya ujumbe huu

KUJITAMBULISHA

Hujambo? Kwa jina naitwa_____na ninafanya kazi katika untafiti unaofanya na Eugenia King'ori ambaye ni mwanafunzi wa chuo kikuu cha Nairobi. Anafanya huu utafiti kama sehemu ya masomo yake ka shahada ya Master's. Mimi ninaitwa Eugenia King'ori na ni mwanafunzi katika chuo kikuu cha Nairobi. Ninafanya utafiti huu kama sehemu ya shahada ya Master's. Pamoja nami ni_____ambaye atakuwa akinakili mazungumzo yetu. Huu utafiti una ithini ya Kamati ya Maadili na Utafiti ya Hospitali ya Kenyatta-Chuo Kikuu cha Nairobi. Pia una ithini na Wizara ya Seriakali ya Kauti ya Nyeri.

Umealikwa kujihusisha na utafiti huu unaoitwa utafiti kuhusu "Tabia za Kula na Hali ya Lishe ya Wanawake Wajawazito: Utafiti kati ya wanawake wajawazito wanopata huduma za wajawazito Eneo Mbunge la Othaya nchini Kenya". Kabla ya kuhusishwa tungependa uelewe sababu ya utafiti huu na itahusisha nini. Tafadhali chukua muda kusoma ama kusikiza taarifa ifuatayo. Tafadhali niulize chochote ambacho huelewi ama iwapo unahitaji ujumbe zaidi.Ukishajibiwa maswali yako yote na umeelewa kuhusu utafiti huu, utaulizwa kama ungependa kushiriki, unieleze kwa sauti kama umekubali kuhojiwa. Kabla Kujua zaidi kuhusu utafiti huu ni muhimu kujua kwamba: kuhusika kwako ni kwa hiari; Una uhuru wa kuuliza maswali yoyote ili uelewe utafiti huu kabla ya kushiriki; hakuna adhabu yoyote iwapo utaamuwa kusitisha kujihusisha kwako kwenye utafiti huu wakati wowote. Utapewa nakala ya fomu hii iliyo na sahihi.

Lengo la utafiti huu

Utafiti huu unahusu nini?

Huu utafiti una lengo la: i) Kutathmini hali ya lishe ya wanawake wajawazito wanaohudhuria kliniki ya wajawazito katika Eneo Mbunge la Othaya kwa mara ya kwanza katika ujauzito wa sasa, ii) kuchunguza tabia za lishe za wanawake wajawazito katika eneo mbunge la Othaya iii) kuchunguza sababy zinazoshawishi tabia ya lishe kati ya wanawake wajawazito katika Jimbo la Othaya iv) kutathmini ushawishi wa ujuzi wa chakula kati ya wanawake wajawazito juu ya tabia zao za chakula na hali ya lishe v) kuchunguza mikakati iliyopo ambayo hushughulikia tabia ya lishe na hali ya lishe ya wanawake wajawazito katika eneo mbunge la Othaya.

Kwa nini nimealikwa kushiriki?

Umealikwa kushiriki kwa sababu sababu unatafuta huduma za ANC katika kituo hiki cha afya. Kwa kukuhoji wewe na wanawake wengine kama wewe, tutaelewa kuhusu wanawake wajawazito katika Eneo Mbunge hili, tabia zao za chakula, sababu zinazochangia chakula chao, ujuzi wao wa chakula na hali yao ya lishe.

Ni nini itafanyika nikishiriki?

Ukikubali kushiriki kwenye utafiti huu, utaulizwa kushiriki katika mazungumzo yatakayohusu akina mama wajawazito kama nane au kumi. Tutazumgumza na wewe na hao kina mama wengine kuhusu vyakula watu katika jamii yako wanavyokula na kile kinachovhangia uamuzi wao wa chakula, ujuzi wao wa lishe na hatua zinazowekwa katika Eneo Mbuge la Othaya kwa kushughulikia tabia za chakula na hali ya lishe ya wanawake wajawazito. Pia vipimo vyako vya damu na mkono vitachukuliwa kutoa rekodi za hospitali. Mazungumzo yatanakiliwa.

Mazungumzo yatachukua muda gani?

Itachukua muda wa kama dakika 60.

Risks/Madhara

Madhara ya utafiti huu ni yapi?

Sidhani kama kuna hatari kubwa kwako wakati wa utafiti huu. Walakini, kunaweza kuwa na hatari ya kupata usumbufu wakati wa kujibu maswali kadhaa kuhusu maisha yako ya maswali kama maswali juu ya mapato yako na tabia yako ya lishe.

Faida

Hakuna faida za moja kwa moja kwako kwa kushiriki katika utafiti. Unaweza kupata faida isiyo ya moja kwa moja kwa kujua umeshiriki kwenye utafiti muhimu ambao unaweza kusaidia wanawake wengine katika siku zijazo. Pia, utafaidika kutokana na kujifunza zaidi juu ya hali yako ya lishe.

Fidia

Mbali na Kshs.300 utakayopokea kama ulipaji wa kusafiri, hautalipwa fidia ya kushiriki katika utafiti huu.

Usiri

Je kuhusika kwangu kutakuwa siri?

Tutaweka kwa siri ujumbe wowote unaokusanywa wakati wa mazungumzo haya. Hatutaliandiak jina lako popote kwa recodi zetu. Tutatumia ujumbe wowote kutoka kwako kuandika ripoti yetu ya mwisho lakini jina lako halitahusishwa. Watafiti wataweka juhudi kuhakikisha siri ya ujumbe wowote utakao tupatia. Utajulikana kwa kutumia alama /nambari ya siri na ujumbe wako wa kibinafsi hautatolewa kwa njia yoyote.

Uhiari

Je nina haki gani kwa kuhusika?

kuhusika unaruhusiwa kutojibu swali lolote. Iwapo utajitoa kwa mazumgumzo utapata nauli yako.

Maelezo zaida

Je nitapokea nini kwa kuhusika? Kando na nauli hakuna malipo ya ziada kwa kuhusika kwa utafiti huu.

Ni nini kitatendeka kwa matokeo ya utafiti huu? Matokeo ya utafiti huu yatatumika kuandika ripoti, na kuchapishwa kwenye nakala ya kupea watu.

Je nikitaka habari zaidi?

Je nikihitaji ujumbe zaidi? Ikiwa unayo maswala yoyote kuhusu huu utafiti, tafadhali wasiliana na Eugenia King'ori, (email: kingorie@gmail.com/ mobile: 0723-498220). Iwapo una swali lolote kuhusu utafiti huu na unahitaji kuwasiliana na mtu mwingine, unaweza wasiliana na Kamati ya

Maadili na Utafiti ya Hospitali ya Kenyatta-Chuo Kikuu cha Nairobi P O BOX 20723 Code 00202, (254-020) 2726300 Ext 44355, Email: uonknh_erc@uonbi.ac.ke

Je una maswali yoyote kuhusu utafiti huu na kuhusishwa kwako?

Azimio la mshirika:

Ninapeana ridhaa kuhusishwa kwangu katika utafiti huu utafiti kuhusu "Tabia za Kula na Hali ya Lishe ya Wanawake Wajawazito: Utafiti kati ya wanawake wajawazito wanopata huduma za wajawazito Eneo Mbunge la Othaya nchini Kenya". Nafahamu lengo la utafiti huu na kinachohitajika kutoka kwangu kwa kushiriki. Nimeelezwa madhara na faida. Nimejibiwa vya kutosha maswali yoyote kuhusu utafiti huu na ninafahamu nina uhuru wa kusitisha/kutoka kwa utafiti huu wakati wowote bila adhabu. Ninapeana ridhaa/ Ninakubali kushiriki kwa hiari.

I have accepted to be interviewed/Nimekubali kuhojiwa (tick the box) ☐

OR

Sahihi……Tarehe ……

APPENDIX IX: INFORMED CONSENT WITH KEY INFORMANTS

DIETARY HABITS AND NUTRITIONAL STATUS OF PREGNANT WOMEN: A STUDY OF PREGNANT WOMEN SEEKING ANC SERVICES IN OTHAYA CONSTITUENCY, NYERI COUNTY, IN KENYA

INFORMED CONSENT WITH KEY INFORMANTS

Informed consent and information sheet for health provider

A copy of this form that contains the information will be issued to you

My name is _____. I am working on a study being conducted by Eugenia King'ori who is learning at the University of Nairobi and carrying out this study as part of her Master's degree qualification./My name is Eugenia King'ori, a student from the University of Nairobi. I am conducting a study as part of my qualification for my Master's degree at the University. Approval for this research has been received from the Kenyatta National Hospital-University of Nairobi Ethics and Research Committee. It also has approval from the Nyeri County Government Ministry of Health.

You are being requested to take part in the research, named "*Dietary Habits and Nutritional Status of Pregnant Women: A Study of Pregnant Women Seeking ANC Services in Othaya Constituency, Nyeri County, in Kenya*". Before you decide whether to participate, you need to understand why the research is being done and what it would involve. Your questions will be addressed and additional information you may want will be given after which you will be asked if you want to participate. If you agree to be interviewed tell me verbally (out loud). Before you are given more information concerning the study, you need to take note of the fact that: your taking part is voluntary; you will not be penalized if you decide to stop the study at any time. You will be given a signed copy of this form to keep.

Purpose of the study

What is the study about?

The aim of the study is: i) to assess the nutritional status of pregnant women in Othaya Constituency making their first ANC visit during their current pregnancy, ii) to establish the dietary habits of pregnant women in Othaya Constituency, iii) to determine the factors influencing

dietary habits among pregnant women in Othaya Constituency, iv) to examine the role of dietary knowledge on the dietary habits and nutritional status of pregnant women Othaya Constituency making their first ANC visit during their current pregnancy and v) to identify and document existing strategies which address the dietary habits and nutritional status of pregnant women in the Constituency.

Why have I been invited to participate?

You are being requested to participate because are involved in the provision of nutrition services to pregnant women. By interviewing you, and other people in similar roles we'll learn about the dietary habits of pregnant women, factors that lead to their choice of food, their nutrition knowledge, and the interventions that are in place to address the dietary habits and nutritional status of pregnant women.

What will happen if I take part?

If you get involved in the study, you will be asked about your work, your knowledge on dietary habits and nutritional status of pregnant women, factors that influence the dietary habits and nutritional status of pregnant women, your role in the nutrition of pregnant women, and the interventions that are in place to address dietary habits of pregnant women in Othaya Constituency

What is the length of time that the interview will take?

This will take about 30-45 minutes.

Risks

What risks are there in this study?

We anticipate no risks to you in the course of this research. It is unlikely that you will suffer any harm as a arising from your involvement in this research.

Benefits

What are the benefits of participating?

There are no direct benefits to you for participating in the study. You may find an indirect benefit in knowing you have participated in an important study that could help others in the future. Also,

by participating in this study and answering our questions, you will help understand the dietary habits and nutritional status of pregnant women.

Compensation

No compensation will be given to you for your involvement in this study.

Confidentiality

Will my participation in the study be kept confidential?

The information that is collected during the interview will be kept private. The final report will use the information we receive from you, but we will not use your name. The study team will make every effort to uphold confidentiality concerning information provided by you. A code will be used as your identification and personal information derived from the interview will not be disclosed.

Voluntariness

As a participant, what are my rights?

Your participation in this study is completely voluntary. If you decide not to participate, there are no negative repercussions. If you agree to take part, you terminate your participation at any time without penalty. You are free to not to answer any questions that you don't want to.

Additional Information

There is no money given for participating in the study.

What is going to happen to this study's findings?

The findings will be put down in a report could be published in a journal to share with other people.

What if there is more information that I need*?*

In case of any concern that pertains to any area of the study, please contact Eugenia King'ori, (email: kingorie@gmail.com/ mobile: 0723-498220). In the event you have any questions you about this research and would like to talk to someone, else you are encouraged to contact Kenyatta

National Hospital-University of Nairobi Ethics and Research Committee P O BOX 20723 Code 00202, (254-020) 2726300 Ext 44355, Email: uonknh_erc@uonbi.ac.ke

Have you any questions concerning the study and your participation?

Declaration of participant*:*

I give my consent for you to me in the study entitled "*Dietary Habits and Nutritional Status of Pregnant Women: A Study of Pregnant Women Seeking ANC Services in Othaya Constituency, Nyeri County, in Kenya*". The study's aim is clear to me, and what will be required of me if I take part in it. I have received an explanation of the risks as well as the benefits any questions I had which relate the research have been sufficiently responded to. I am aware I have the right to pull out of the study at any moment if it is my wish to do so and there will be a penalty for this. I voluntarily give my consent to participate in this study.

Respondent's Name ……

Signature…….Date…….

APPENDIX X: ERC APPROVAL LETTER

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
Tel:(254-020) 2726300 Ext 44355

KNH-UON ERC
Email: uonknh_erc@uonbi.ac.ke
Website: http://www.erc.uonbi.ac.ke
Facebook: https://www.facebook.com/uonknh.erc
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

KENYATTA NATIONAL HOSPITAL APPROVED 13 DEC 2019 KNH/UoN-ERC P. O. BOX 20723 - 00202 NAIROBI

Ref: KNH-ERC/A/467

13th December , 2019

Eugenia King'ori
Reg.No.C50/87424/2016
Dept.of Sociology and Social Work
Faculty of Arts
College of Humanities and Social Sciences
University of Nairobi

Dear Eugenia

RESEARCH PROPOSAL: DIETARY HABITS AND NUTRITIONAL STATUS OF PREGNANT WOMEN: A STUDY OF PREGNANT WOMEN SEEKING A.N.C SERVICES IN OTHAYA CONSTITUENCY IN KENYA (P416/05/2019)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and approved your above research proposal. The approval period is 13th December 2019 – 12th December 2020.

This approval is subject to compliance with the following requirements:

a. Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
b. All changes (amendments, deviations, violations etc.) are submitted for review and approval by KNH-UoN ERC before implementation.
c. Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
d. Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
e. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
f. Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

For more details consult the KNH- UoN ERC website http://www.erc.uonbi.ac.ke

Yours sincerely,

PROF. M. L. CHINDIA
SECRETARY, KNH-UoN ERC

c.c. The Principal, College of Health Sciences, UoN
The Director, CS, KNH
The Chairperson, KNH- UoN ERC
The Assistant Director, Health Information, KNH
The Dean, Faculty of Arts, UoN
The Chair, Dept. of Sociology and Social Work, UON
Supervisor: Dr. Jennifer Birechi, Dept.of Sociology and Social Work. UoN

APPENDIX XI: UON AUTHORIZATION

UNIVERSITY OF NAIROBI
DEPARTMENT OF SOCIOLOGY & SOCIAL WORK

Fax 254-2-245566
Telex 22095 Varsity Nairobi Kenya
Tel. 318262/5 Ext. 28167

P.O. Box 30197
Nairobi
Kenya

January 31, 2020

TO WHOM IT MAY CONCERN

EUGENIA KING'ORI - C50/87424/2016

Through this letter, I wish to confirm that the above named is a bonafide postgraduate student in the Department of Sociology & Social Work, University of Nairobi. She has presented her project proposal entitled; **"Dietary habits and nutritional status of pregnant women: A study of pregnant women seeking ANC services in Othaya Constituency in Kenya."**

Eugenia is required to collect data pertaining to the research problem from the selected organization to enable her complete her project paper which is a requirement of the Masters degree.

Kindly give her any assistance she may need.

Thank you.

P. O. Box 30197
NAIROBI

Prof.C.B.K. Nzioka
Chairman, Department of Sociology and Social Work

APPENDIX XII: NYERI COUNTY GOVERNMENT APPROVAL

REPUBLIC OF KENYA

COUNTY GOVERNMENT OF NYERI
DEPARTMENT OF HEALTH SERVICES
OFFICE OF THE DIRECTOR

Email: nyericountyhealth@yahoo.com

COUNTY COMMISSIONER'S HQ
BLOCK 'A'
P.O. Box 110 - 10100

REF: CGN/HEALTH/HRM/5/VOL.II **Date: 10th July 2020**

TO WHOM IT MAY CONCERN

RE: AUTHORIZATION TO COLLECT RESEARCH DATA

The bearer of this letter **Eugenia Kingori** is a post graduate student in the department of Sociology & Social work at the University of Nairobi,

She is hence introduced to collect data on the topic ***"Dietary habits and nutritional status of pregnant women seeking ANC services in Othaya constituency in Kenya"***

Kindly accord her the necessary assistance.

The student must deposit a copy of the final report with the department following completion of the study.

Dr. Oscar Agoro
For: County Director of Health Services
NYERI