DRIVERS OF FOOD CHOICE, DIETARY PRACTICES AND NUTRITION STATUS OF WOMEN AGED 18-59 YEARS IN KIAMBU COUNTY, KENYA

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JULY, 2025

DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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DEDICATION

This thesis is dedicated to my dearly loved husband, Chris and our cherished children, Makenna and Thayu. My most profound gratitude to my dear parents, Daniel and Joyce, for their prayers, love coupled with your steadfast support. Additionally, I extend my thanks to my siblings, Allan and Lindah, for their companionship and ever listening ear.

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ABBREVIATIONS/ACRONYMS

BMI	Body Mass Index
DDQ	Dietary Diversity Questionnaire
DNCD	Division of Non Communicable Diseases
EUFIC	European Food Information Council
FCQ	Food Choice Questionnaire
KDHS	Kenya Demographic and Health Survey
KNBS	Kenya National Bureau of Statistics
KUERC	Kenyatta University Ethical Review Committee
MDD-W	Minimum Dietary Diversity
MDD-W	Minimum Dietary Diversity for Women
MOH	Ministry of Health
NCDs	Non Communicable Diseases
RC	Risk Category
SES	Socio-economic Status
SSA	Sub Saharan Africa
WC	Waist Circumference
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Drivers: A complex set of factors that influence an individual's behavior. In this case the behavior was food choice.

Drivers of Food Choice: The complex interplay of competing, reinforcing, and interacting influences from multiple factors influencing the selection of food for consumption. These drivers included mood, health, weight control, price and preparation convenience, sensory appeal, and familiarity.

Dietary Diversity: In this study, a Dietary Diversity Questionnaire (DDQ) focused on the dietary habits of individuals within a 24-hour period prior to the date of data collection. Dietary diversity (DD) was employed as a proxy for evaluating the quality and variety of dietary consumption, with specific relevance to its application in developing countries. This approach offered several advantages, including simplicity, cost-effectiveness, and ease of data collection. Furthermore, the Dietary Diversity Score (DDS) provided insights into individual dietary quality, where a higher individual-level dietary diversity score indicated a more balanced diet with a wider range of nutrient sources. In this context, an MDD-W (Minimum Dietary Diversity for Women) cut-off of greater

than or equal to 5 was considered indicative of an adequate dietary diversity.

Nutritional Status: A condition of the body with respect to an individual's Body composition. This was measured using Body mass index scale as well as Circumference of the waist. A BMI < 18.5kg/m2 was considered under-weight, 18.5kg/m^2 - 24.9 kg/m^2, normal, 25.0 kg/m^2 – 29.9 kg/m^2, over weight and >30kg/m2 considered obese. Furthermore, a WC >80cm was considered to be part of the at risk category.

ABSTRACT

Drivers of food choice are complex factors that interact to influence individual food consumption. Twenty-eight percent of Kenyans between the ages of 18 and 69 are classed as either overweight or obese, with more than half of hospital admissions being due to illnesses related to non-communicable diseases (NCDs). In Kiambu, 55.6% of the women are either overweight or obese. This study was to explore the drivers of food choice, dietary diversity and the nutritional status of women aged 18-59 in Kiambu County. A cross-sectional analytical design was employed. Kiambu County was selected due to the residents' exposure to both rural and urban lifestyle influence. The sample size calculated was 420 women with a response rate of 383 women participants' selected using multistage sampling. Data was collected by use of validated structured tools. Data analysis of mean, percentages, frequencies, Spearman's rho and multinomial logistical regression was carried out using SPSS version 23.0. The study found that 63.9% of the women were either overweight or obese, while 67.6% had a waist circumference >80 cm, indicating a pressing public health concern due to high visceral fat. The study found a moderate level of dietary diversity among the participants (5.67 ±1.89), with 51.4% of the population meeting their Mean dietary diversity for women (MDD-W). All of the participants (100%) answered affirmatively that when asked whether it was important to them that the food they ate could be bought close by , was nutritious and looked nice as factors of convenience, health and sensory appeal. Marital status was strongly correlated with availability in shops and ease of preparation (is what I usually eat) (P=0.000), freedom from food scare as a factor of risk perception (P=0.000) and familiarity (is what I usually eat) (P=0.000). The study found no significant relationship between drivers of food choice and dietary diversity (P=0.308) as well as drivers of food choice and either BMI or waist circumference) (P= 0.171, P=0.921). Future research should explore various physiological stages of women, specific meals of interest, seasonal variations in food choice drivers, and the relationship between drivers choice of food and nutrition status in populations with specific non-communicable diseases.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

When individuals consume food, usually their main goal is to satisfy hunger. They do not consider what foods they need to satisfy their nutrition and physiological needs but instead, a complex mixture of factors come into play(Chen, 2017). These factors determine choices in food to be consumed. Food choice refers to the selection of foods for consumption, which results from a complex combination of competing, reinforcing, and interacting factors (Kouritzin et al., 2023). The drivers of food choice can be divided into two major classifications. These are, individual and environmental drivers of food choice. Individual drivers of food choice include demographic characteristics, behaviors and cognitions which give rise to attitudes, knowledge, preferences and food values (Gissing et al. 2017). Environmental drivers of food choice include social drivers (family and peers), physical drivers which include access and convenience with regard to food and the Macro environment which is influenced by social norms including religion and social ethics (Gissing et al. 2017).

In a study exploring the factors influencing food choice among Malawian consumers, researchers developed a 21-item questionnaire based on five key drivers, reflecting the major influences on food selection within the Sub-Saharan African context (Gama et al. 2018). These were mood, health, price and preparation convenience, sensory appeal and familiarity. The type of food chosen and consumed influences an individual's nutrition status and can also result to overweight and obesity (Spinelli & Monteleone,2021). Overweight and obesity are key risk factors in development of Non Communicable

Diseases (NCDs) (Kang et al. 2021). The pervasiveness of overweight and obesity has risen globally to epidemic proportions, with over 1.6 billion (approximately 39%) adults being overweight and at least 300 million (13%) being clinically obese that is having a Body Mass Index (BMI) of over 30kgs/m^2 (WHO, 2017). Kenya's 2015 STEPwise Survey on risk factors for non-communicable diseases (MoH-Kenya, 2015) found that 28% of Kenyans aged 18-69 years are either overweight or obese. The rates are significantly higher in women (38.5%) than men (17.5%). Within the reproductive-age among the female population (15-49 years), the rate of overweight and obesity is 33% (MoH, 2015). In Kiambu County, which is the study area, a staggering 55.6% of all women are either overweight or obese (KNBS, 2022) which increases their risk for developing NCDs greatly. At the national level, non-communicable diseases were found to be responsible for 33% of all recorded deaths (WHO, 2017).

Having a grasp on the factors that influence food choice is essential for the effectiveness of public health strategies and policies aimed at addressing health issues such as diabetes, heart disease, and other diet-related conditions (World Heart Federation, 2016). Effectively addressing health challenges can help lessen the impact of the double burden of disease, which places a heavy financial strain on individuals, families, and communities, driving many into poverty and hindering overall economic development (MoH, 2015). Though there has been an increase in public health campaigns that encourage healthy eating and exercise among the population with an aim of improving these statistics (Baldwin, 2015), the intention to adopt a healthy lifestyle has not translated to behavior change. Attempts to achieve good health and nutrition goals are hindered by limited knowledge of drivers of food choice (Schouteten, 2016). An increase in knowledge on the drivers of food

choice among Kenyans and especially women will inform programming and ultimately influence nutrient intake and ultimately improve the health outcomes of women and in the long run, the whole population.

1.2 Statement of the problem

Given that overweight and obesity are major contributors to the onset of non-communicable diseases (NCDs), the prevalence of these conditions is increasingly high, with 26% of all Kenyan adults affected. A particularly concerning 34% of women are affected. In Kiambu County, the situation is even more alarming, with overweight and obesity rates at 55.6% among women, indicating that almost half of the female population in the county is at risk of developing NCDs. This alarming trend can largely be attributed to changing lifestyles, particularly due to the urbanization of the county(Kuddus et al. 2020). Although numerous information sources exist and awareness about healthy eating is increasing, a noticeable gap remains between the intention to follow better dietary habits and the actual behaviors practiced (MoH, 2015). The results of this study aim to further contribute to the ongoing efforts by the Kenyan Ministry of Health as outlined in the Kenya NCD Strategic Plan (2021-2025) (MoH, 2021) to reduce the prevalence of NCDs in the country. This study will also contribute to the understanding of dietary diversity in the context of the high prevalence of overweight and obesity, offering insights into the factors influencing dietary choices and the nutritional status of women. It will provide a stepping stone in the development of targeted programmes to enhance dietary diversity among women aged 18 – 59 years by taking into considering their food choices.

1.3 Justification

This study sought to explore the factors influencing food choice, assess dietary diversity, and evaluate the nutritional status of women aged 18 to 59 years in Kiambu County.

1.4 Research Questions

1. What are the socio-economic and demographic characteristics of women aged 18–59 years in Kiambu County?
2. What are the drivers influencing food choices among women aged 18–59 years in Kiambu County?
3. What is the level of dietary diversity among women aged 18–59 years in Kiambu County?
4. What is the nutritional status of women aged 18–59 years in Kiambu county
5. Is there an association between the drivers of food choice and the nutritional status of women aged 18–59 years in Kiambu County?

1.5 Hypotheses

H_{01} There is no significant relationship between drivers of food choice and the dietary diversity of women aged 18-59 years in Kiambu County

H_{02} There is no significant relationship between drivers of food choice and the nutrition status of women aged 18-59 years in Kiambu County.

1.6 Objectives of the study

The objectives of this study were to:

1. Establish the socio-economic and demographic characteristics of women aged 18-59 years in Kiambu Constituency, Kiambu County
2. Identify the drivers of food choice (health, mood, sensory appeal, familiarity, weight control, price, convenience, and religion) among women aged 18-59 years in Kiambu Constituency, Kiambu County.
3. Determine the dietary diversity of women aged 18-59 years in Kiambu Constituency, Kiambu County
4. Assess the nutrition status of women aged 18-59 years in Kiambu County.
5. Determine the relationship between drivers of food choice and the nutrition status of women aged 18-59 years in Kiambu Constituency, Kiambu County.

1.7 Significance of the study

Results of this study will benefit individuals, behavior change educators, and policy makers in the design of health communication interventions in order to promote optimum nutrition and reduce the burden of disease brought about by lifestyle diseases. Through this study, the agents of socialization including the media and advertising companies would be sensitized on their potential role in fostering healthy eating behaviors among women within the same demographic characteristics as the study population. The study will empower the population to have an awareness of what drives their food choices and hence direct

themselves to make better choices. Finally, the findings add to the existing body of research on the factors that shape food choice.

1.8 Limitation and delimitation of the study

1.8.1 Limitation of the study

Since the study was cross-sectional, it did not account for seasonal changes in dietary diversity and the food choice drivers. Also, the Covid-19 pandemic made it difficult to carry out as multiple focus group discussions (FGDs) and necessitated the adaptation of the MoH protocols to combat the spread of the virus. Due to this limitation, only one FDG was carried out.

1.8.2 Delimitation of the study

The study only investigated women aged 18-59 years regardless of their socioeconomic characteristics and health status. The information can only be generalized to similar populations in other settings

1.9 Conceptual framework

The conceptual framework exhibited in Figure 1.1 explains how, the drivers (Psychological, biological, socio-cultural, economic and environmental factors) of food choice affect consumption patterns and ultimately, the health and nutritional well-being of an individual.

Demographics play a big role in an individual’s life. These then influence the Individual’s food choice motivations and drive their food choice, which in turn influences their dietary

diversity (Schouteten, 2016). The interaction between drivers of food choices and dietary diversity ultimately affects their nutrition status (Leng et al. 2017). Drivers of food choice are not static, but are seen to have variations across demographic characteristics including age and gender (Gama et al. 2018). The drivers of food choice may also change through life's transitions as human beings strive to adapt to their new conditions (Aschemann-Witzel et al, 2018).

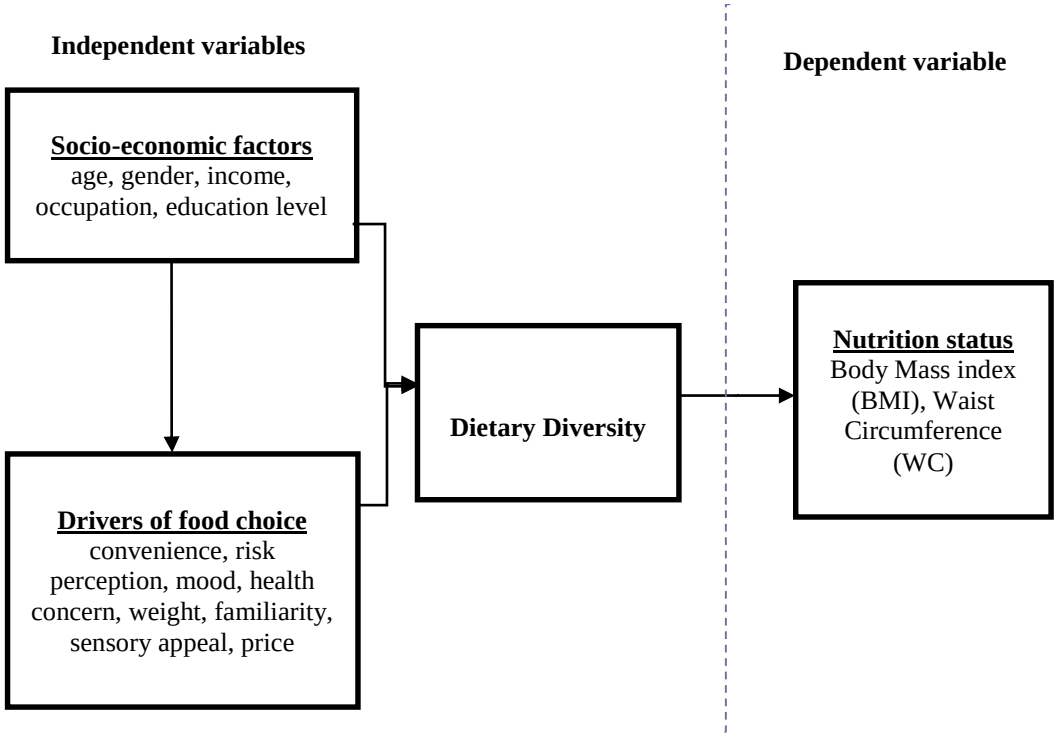

Figure 1.1: Conceptual framework on the interaction between socioeconomic characteristics, drivers of food choice, dietary diversity, and nutrition status.
Source: Adapted from Ghana et al. (2018) and Schouteten (2016).

CHAPTER TWO: LITERATURE REVIEW

2.1 Drivers of food choice in the general population

Drivers of food choice impact the individuals' dietary practices with regard to what, how and when to eat and ultimately, their nutrition status. Gama et al. (2018). A study based in Sub Saharan Africa, which used the food choice approach revealed that, factors that came into play when determining food choice among the people of Malawi were: health, prices, preparation convenience, mood, sensory appeal and being familiar with it. These account for 50.39% of the overall variability. Religion and sensory appeal ranked highest as drivers of food choice in an urban population (Karanja et al. 2022). Using a food choice questionnaire added additional items to the original FCQ which were religion and risk perception. In the current study, main drivers of food choice studied were health, price, weight control, risk perception, natural content, mood, sensory appeal, convenience, familiarity, religion and ethical issues.

2.1.1 Sensory appeal and mood

Taste is the main driver of food choice for most people (Vadiveloo et al. 2013). The brain and gut have an appetite physiological system link that is used to guide the amount of food consumed (Miller, 2019). Mood is also a major influence when it comes to food choice behavior (Sleddens et al.2015). In some people, suppression of appetite and food intake can occur due to negative emotions of high arousal or intensity (Hardcastle et. al. 2015). In Malawi, a study found that sensory appeal was not the most driver of choice as compared to more affluent countries due to the persistent food shortages as opposed to the satiety value (Gama et al, 2018).

2.1.2 Health, weight control and risk perception

Hedonistic values associated with food and preserving health or wellbeing impact dietary decisions, whereas improper eating patterns and unbalanced weight-control strategies have been seen to increase the risk of weight gain (Maarson, 2016).

Highest increases in Body Mass Index (BMI) largely include; skipping meals, very little feeding and taking “diet pills” (Leng et al. 2016). Women, compared to men, have been found to make healthier food choices due their stronger beliefs in healthy eating and greater concern for physical appearance (Kahari 2021). An individuals’ risk perception can serve as a valuable indicator for evaluating the potential impact of health initiatives aimed at raising public awareness about the dangers of consuming contaminated food. (Onyango, 2016). When studying food safety perceptions among Kenyan actors in central Kenya, (Ogola 2017), found that risk perception improves with income, education and work experience. There is need to assess the extent that risk perception, health and weight control influence food choice in the Kenyan context.

2.1.3 Price of food and convenience

Most times, an individual will lean towards low nutrient – energy dense foods as in the case of the Kenyan diet which has an overreliance on staples (Kuddus et al. 2020). Lower socio-economic groups especially in the unemployed and retired category of the populations are affected more by food prices compared to other people (Ares et. al. 2017). Areas that have poor access to affordable healthy foods are often considered as responsible for obstructing healthy diets and propagating health inequalities (Vilar-Compte et al. 2021).Studies have found that a high monthly income did not adversely influence

convenience and price as drivers of food choice but respondents with lower income ranked price and convenience highly (Kang et al. 2021). It has been seen that income, positively affect usage of unprocessed food and negatively affect low-income populations with respect to primary staples such as flour among Kenyans living in small towns (Rischke et al, 2015). This study provides a basis for comparison with studies done in other countries on the influence of price and convenience to food choice.

2.1.4 Familiarity, natural content, religion and ethical concerns

A large chunk of dietary learning occurs early in life and by adulthood, our ability to learn new associations has been hampered due to over saturation on our learning capacities hence our tendencies to stick to what is familiar (Leng, et al, 2016). Females have been found more likely to be concerned about familiarity when compared to men (Gama et al. 2018). Our learned beliefs are eating relationships that have established within families, groups, religions, communities and various social units (Higgs and Thomas, 2016). The factors that are important to cuisine include; type of food being served, order of service, social organization of a meal, having table manners and ritual. Also the meaning of food in life (Oncini, 2019). Roles that are related to culture may be involved in the shaping of ideals and identities. These roles have also been known to influence the concept of food choices (Abdullah, 2016). Since motivations of food choice tend to change across demographics, this study provides data that cuts across urban and rural populations with regard to the extent at which food choice is affected by familiarity, religion, ethics and content of food.

2.2 Dietary diversity in Kenya

The Kenyan diet has a great overreliance on staples which in turn predisposes the population to micronutrient deficiencies as well as obesity and overweight (Mwale, 2022). Only around 5.2% of adults meet the WHO's daily recommendation for fruit and/or vegetable intake, with most individuals eating fruits approximately 2.4 days per week and vegetables around five days weekly. Moreover, the STEPwise survey (MoH, 2017) notes that about 20% of the population consistently adds salt or salty sauces to their meals before eating, while 3.7% regularly consume processed foods that are high in salt (MoH, 2017). A large proportion, approximately 83.5% add sugar to beverages or food prepared at home with 28% saying that they always add sugar to beverages. With regard to use of fats and oils, those who use oil are a higher proportion (59.1%) than those who use fat (38.5%) (MoH-Kenya, 2015). This hampers progress towards achieving the objectives of the Kenya Non-Communicable Disease (NCD) Strategic Plan (2021-2025) (MoH, 2021).

The diet of the population tends to change when populations grow in size or when there is increase in income per capita (Amugusi et al. 2019). The trend moves from a diet rich in carbohydrates to that richer in calories, fats, sugars, livestock based products and vegetables (Berkum et al. 2017). Rates of overweight and obesity are on the rise across rural and urban populations alike (Amugusi et al. 2019). Research shows that the changing trends in the number of the overweight and obese are as a result of the effects of globalization to the food systems (Madise and Letamo, 2017). Globalization has gone as far as encouraging the influx of processed foods, which are cheaper into the food market due to foreign direct investment and market liberalization (Madise and Latemo, 2017). Mkuu et al. (2021) noted that as socio-economic status (SES) among women increased, the

average food consumption increased and in return, the overweight and obesity rates in rural women of high SES were equivalent to those of urban women.

Supermarkets have been spreading fast throughout the East-African countries. More supermarkets chains have sprouted in recent years and rapidly gained increased importance in Kenya (Rischke et al. 2015). Leng (2017), argues that in recent times, retailers have now taken the role of determining the portions of meals, serving larger portions to attract more clients. This not only affects intake, but also the choice of foods that individual eats (Leng, 2017). study conducted in Central Kenya by Kimenju et al. (2015) found a positive association between supermarket shopping and higher BMI. Their findings revealed that BMI increased by 0.64 kg/m^2 as consumers showed a stronger preference for purchasing food from supermarkets among their study population (Kimenju et al. 2015).

Though studies have been done focusing on the dietary habits of the population most data are collected at a household level and therefore generalized to include the female population. It was also noted that a vast number of studies focused on the rural/ agricultural population of Kiambu County. There is need to carry out a study that focuses on women, the probable link between the drivers of food choice and the food consumption patterns of women.

2.3 Nutritional status of women aged 18-59 years in Kiambu County

Non-communicable diseases are the major global public health challenges, with profound socio-economic consequences for health services, lost productivity and premature mortality (World Health Organization, 2016). Body Mass Index (BMI) is a commonly used indicator for estimating body fat. It is calculated by dividing a person's weight in kilograms

by the square of their height in meters. It reflects overall body fatness and has been linked to several health outcomes (Emdin et al., 2017). According to a 2015 report by the Kenya National Bureau of Statistics, 45.7% of women in Kiambu County were categorized as overweight or obese (KNBS, 2015). Since then, this figure has risen to 55.6%, highlighting an alarming upward trend in the prevalence of obesity in the region..(KNBS. 2022). The elevated rates of overweight and obesity among women are alarming, as a woman's nutritional status has a direct impact on her own health and is strongly connected to the nutritional well-being of her family, particularly that of infants and young children during the periods before, during, and after pregnancy (Waghmare, 2022). Overweight and obesity have been quantified in terms of BMI exceeding the threshold values of 25Kg/m^2 and 30Kg/m^2 respectively and has been used as a marker of risk for NCDs (Al-Ghamdi et al. 2018).

Circumference of the waist, on the other hand, is a measure of abdominal obesity and is often used as an indicator of visceral fat, which is the fat that surrounds the internal organs. An increased waist circumference is linked to a higher risk of developing metabolic and lifestyle conditions, including type 2 diabetes and certain types of cancer. (Aune et al. 2019; Hidayat et al. 2016). Waist circumference is a valuable indicator of nutritional status because it is associated with obesity and health risks (Ross et al. 2020). This provides valuable information about abdominal obesity and visceral fat accumulation, which are strongly associated with various metabolic disorders and chronic diseases. According to Ross et al. (2020) and Saif-Ur-Rahman et al. (2021), a high WC value (>80 cm) is associated with various metabolic disturbances and chronic conditions, including cardiovascular disease, type 2 diabetes, and some types of cancer.

In addition, it has been found to be associated with hypertension Saif-Ur-Rahman et al. (2021) and has been used to predict the risk of preeclampsia in pregnant women (Anupama & Dayal, 2019). Further, waist circumference has shown a significant predictor of all-cause mortality among older adults (Pujilestari et al. 2019).

In order to obtain a comprehensive understanding of an individual nutrition status, it is important that BMI and waist circumference are used in combination to evaluate individual's risk for obesity-related health problems (Ross et al. 2020). This study aimed to examine the relationship between factors influencing food choice and the nutritional status of women in Kiambu County, using both Body Mass Index (BMI) and Waist Circumference (WC) proxies of nutrition status.

2.4 Summary of literature review

With the increasing prevalence of overweight, obesity, and related non-communicable diseases (NCDs), gaining insight into the factors that influence food choice is essential for designing effective public health interventions. However, limited research has been conducted in this field in Sub-Saharan Africa (SSA), where a significant share of the population experiences both undernutrition and malnutrition. This literature review highlights several gaps in the existing research. Although several factors influencing food choice are acknowledged, there remains a gap in fully understanding how these drivers interact and affect the food choices of women in Kiambu County. Furthermore, though the existing literature provides valuable insights into the drivers of food choice, there is limited information on how these drivers interact with the Economic status and demographic profiles of the target population, potentially affecting our understanding of how these

drivers vary among different groups. Moreover, even though the combined use of BMI and waist circumference is acknowledged as important for evaluating nutritional health, how the identified drivers of food choice directly relate to the nutritional status of women in the study's target population remains unclear. These gaps point to the relevance of the present study in contributing a more refined insight into the socio-economic and demographic characteristics, dietary diversity, drivers of food choice, and their effects on Kiambu Constituency women's nutritional status. By addressing these gaps, the study sought to offer meaningful insights that can inform the design of context-specific health interventions and policies tailored to the region.

CHAPTER THREE: METHODS AND MATERIALS

3.1 Research design

In order to ascertain dietary diversity, variables influencing food choice, and nutritional health among women in Kiambu County aged 18 to 59, the study adopted a cross-sectional analytical design. This design provides a snapshot of the Population at a particular point in time and allowed for the examination of the relationships between dietary diversity drivers of food choice, and nutritional status.

3.2 Variables in the Study

3.2.1 Independent variables

These included; drivers of food choices based on; convenience, ethical concern, risk perception, familiarity, natural content, health, mood, price, religion, sensory appeal and weight control, and dietary diversity.

3.2.2 Dependent variable

This was the respondents' nutritional status, measured using waist circumference and Body Mass Index (BMI)

3.3 Location of the study

Kiambu County is in central Kenya with an urbanization index of 60% only second to Nairobi County in central Kenya region at 100% making the population exposed to both rural and urban influences in their lifestyle choices (Kenya Urban Support Programme, 2018). Kiambu County has the third highest poverty index in central Kenya standing at

28.9%. The county is in central region and covers an area of 2,543.5 Km^2. The total female population in Kiambu county was 1,230,454 (KNBS, 2019). The KNBS, (2022)report , estimated that 38.1% of women in Kiambu county were within normal BMI, with 55.6% being either overweight or obese while only 6.3% were underweight, ranking 6^{th} among all Kenyan counties in terms of overweight and obesity rates

3.4 Study population

The study involved women between the ages of 18 and 59 residing in Kiambu Constituency, Kiambu County.

3.4.1 Inclusion criteria

Women aged 18 to 59 years, residing in Kiambu Constituency, Kiambu County, who were willing to participate in the study and had perceived control over their food choices were included in the study.

3.4.2. Exclusion criteria

Individuals who did not provide consent were excluded from the study. Additionally, those who were terminally ill, had disabilities that limited their ability to make independent food choices such as paralysis, restricted mobility, neurocognitive diseases, and severe psychological disorders, or were pregnant were also not incorporated in the study.

3.5 Sampling technique

Sampling was conducted using a multistage approach. Kiambu County, Kiambu constituency and Township ward was sampled purposively. Kiambu County was sampled

purposively due to the high overweight and obesity rates. Township ward was chosen as it was the most cosmopolitan out of the four wards in Kiambu constituency. Two out of the three sub-locations in Township Ward were chosen through simple random sampling using the balloting technique. Eligible households with women aged 18-59 years were randomly sampled. Assistance was given by the Chiefs and village heads, who provided a list of the household members that were used in the sampling frame.

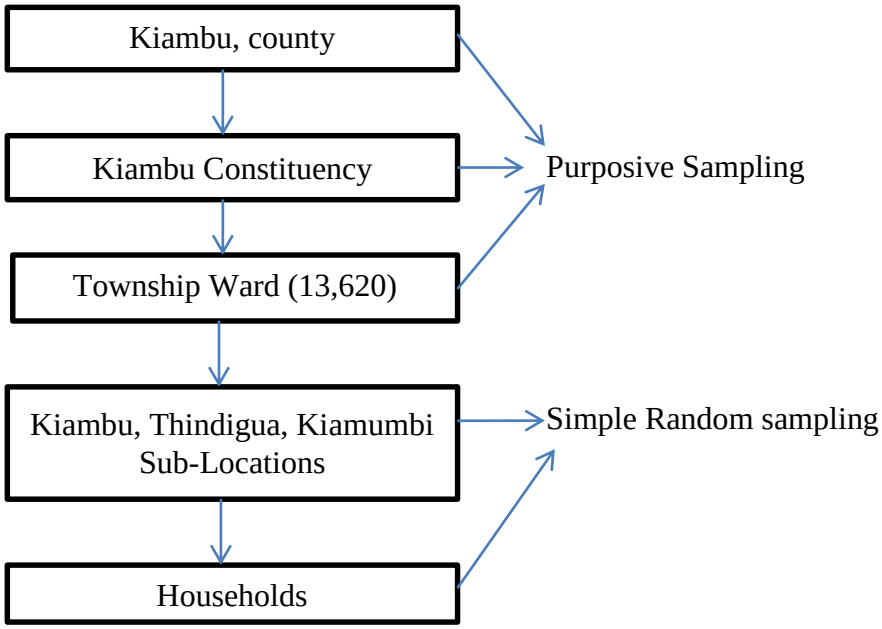

Figure 3.1: Sampling methodology for women aged 18-59 years in Kiambu County
Source: Author's development

3.6 Sample size determination

Fisher et al. (1998) formula was employed to determine sample size.

$$\mathbf{n} = \frac{\mathbf{z^2\ pq}}{\mathbf{d^2}}$$

n= desired sample

z= standard deviate at the required level of confidence

In the case of this study, 95% was the required confidence level. Therefore, the standard normal deviate = 1.96.

P = the proportion of the population, estimated to be overweight or obese, i.e. 45.7% (KNBS, 2015)

q= 1- p. Therefore, in this study q= 1-45.7= 0.54

d= Level of statistical significance. i.e. d = 0.05 since the confidence level is 95%.

Ten percent (10%) of the total was added to compensate for non-response.

$$\frac{(\mathbf{1.96})^{\mathbf{2}}\mathbf{x}\,\mathbf{45.7x}(\mathbf{1}-\mathbf{45.7})}{\mathbf{0.05^{2}}} = \mathbf{419.4506279} \approx \mathbf{420}$$

3.7 Research instruments

A questionnaire (Appendix B) and a focus group discussion (Appendix C) were used to collect data. The questionnaire was divided into four sections. Section I gathered information on demographic and socio-economic characteristics, such as age, sex, marital status, religion, education level and income as well as anthropometric measurements. Section II comprised of a food choice questionnaire as modified and used by Rahman et al. (2013), (Gama et al. 2018)and (Kibr, 2020) It consisted of 41 questions based on 11 categories which included; health, weight management, risk perceptions, mood, sensory appeal convenience, natural contents, price, familiarity, religion and ethical concerns. These were ranked along a dichotomous scale, with participants either answering yes or no to the questions asked. Section III collected information on individual dietary diversity based on the 24-hour period preceding data collection. The diversity score was established

using, summation of food groups consumed as carried out by Gómez et al.(2020). A focus group discussion with 6 women, the youngest being 20 years old while the eldest being 54 years, all living in the study area, was conducted. Using the FDG guide (Appendix C) established using a questionnaire by Roudsari et al.,(2017).

3.8 Pilot study and pre-testing of research tools

The research tools were piloted and pre-tested for accuracy and clarity on a selected sample of 42 individuals prior to the actual data collection, which is 10% of the study in Ruiru Constituency which has similar characteristics to Kiambu Constituency. This pretest helped to identify inconsistencies with the questionnaire, including unclear wording and to ascertain the clarity of the test items in it before administration. The questionnaire was then modified accordingly. Ten percent of the sample, 42 women, was used for the pretest. Pretesting helped to identify and correct errors in the questionnaire, assess feasibility, test respondent comprehension, and increase respondent cooperation, and improve overall research quality. This helped in addressing errors with a view to enhance reliability and validity.

3.9 Validity of the instruments

Validation was achieved through validated methods and tools. The questionnaires were pre-tested and information clarity was ensured. Anthropometric data were collected using the salinity scale recommended by WHO and a previously tested altimeter to ensure a margin of error. The collected data were standardized and recommendations were included in the final survey. The survey instrument was also reviewed by supervisors from the Department of Food, Nutrition and Dietetics to ensure its validity.

3.10 Reliability of the instruments

A test-retest method to check the consistency of the questionnaire to be reproducible was utilized. Same questionnaire was given to the respondents twice within a week. The comparison the answers obtained both times was done and the conclusion made and a test retest correlation was inferred. The Cronbach's alpha coefficient test value was 0.8 with A correlation coefficient value above 0.70 considered to be within the acceptable threshold (IBM Corp, 2013).

3.11 Data collection techniques

Four research assistants, each holding at least a diploma in food and nutrition, were recruited for the study. Procedures and goals for the survey were taught to the research assistants. Additionally, anthropometric measurement techniques were taught to them. Because they knew the study location and the local language better, Kiambu natives were given preference. Data was then collected as outlined.

3.11.1 Socio-demographic characteristics

Data on the socio-demographic traits of the research population was gathered using a semi-structured questionnaire (Appendix B). Information on age, religion, occupation, income, marital status, and state of pregnancy were collected.

3.11.2 Anthropometric Data

3.11.2.1 Body Mass Index

Using calibrated weighing scale with a height meter, respondents' anthropometric data on weight in kilograms and height in meters were taken. This was then presented in kilograms/meters square (Kg/m^2) as BMI.

3.11.2.2 Waist Circumference (WC)

Waist circumference was measured using a non-stretch tape placed midway between the upper border of the iliac crest and the lower margin of the last palpable rib. The result was expressed in centimeters (cm).

3.11.3 Food Choice Questionnaire

Data on the factors influencing food choice were gathered using the FCQ (section II). Convenience, ethical concern, risk perception, familiarity, health, mood, natural content, pricing, religion, sensory appeal, and weight control were among the factors that were evaluated.

3.11.4 Dietary Diversity Questionnaire

A count based dietary diversity questionnaire focusing on the last 24 hours was used in collection of information on the participant's diet preference, where foods are collapsed by groups, then the number of groups consumed counted. This is as outlined by Gupta, (2016). The DDQ was based on the number of food groups consumed over the last 24-hour period to give the Minimum Dietary Diversity Score for Women (MDD-W). The DDQ had 10 food groups and the women answered Yes or No whether they had consumed foods from the groups stated in the last 24 hours. Food groups assessed were; (1) Grains, tubers, white roots and plantains (2) Pulses, peas, beans and lentils (3) Nuts and seeds (4) Dairy (5) poultry, Meat and fish (6) Eggs (7) Dark green leafy vegetables (8) vitamin A-rich fruits (9) Other vegetables and (10) Other fruits (Gitagia et al. 2019). Data was collected during each working day excluding weekends for a period of three weeks.

3.12 Data Analysis

At the close of each day's activities, data collected was counterchecked completion and accuracy. This was then entered into Microsoft excel and cleaned. The data was analyzed using Statistical Package for Social Sciences, version (SPSS) 23.0. Descriptive statistics, means, was used in analysis of data on drivers of food choice. Mean was also utilized to calculate the minimum dietary diversity score for women (MDD-W). A MDD-W greater than or equal to 5 was considered adequate (Sagbo & Kpodji, 2023). Food consumption from the Dietary Diversity questionnaire was presented using mean and percentage means across food groups. Nutrition status of women was analyzed using the BMI score, with a BMI between 18.5 kg/m^2 and less than 25 kg/m^2 classified as normal, values above 25 kg/m^2 considered overweight, and those exceeding 30 kg/m^2 categorized as obese according to the Kenya national guidelines for healthy diets and physical activity (MoH. 2017). These scores were then presented using the percentage. The relationship between the drivers of choice of food and nutrition status, was computed using Spearman's rho. Hypothesis testing was done using multinomial regression analysis, with p values less than 0.05 was considered significant.

Table 3.1: Summary of variables and data analysis

Objective	Variable and indicator	Data collection instrument	Nature of Variable	Statistical test and data presentation
1. Establish the socio-economic and demographic characteristics of women aged 18-59 years in Kiambu Constituency, Kiambu County.	Age Marital status Pregnancy Status Income Occupation Education level Religion	Researcher administered questionnaire	Continuous Categorical	Descriptive statistics Frequencies Means Percentage, distribution tables
2. Determine the dietary diversity of women aged 18-59 years in Kiambu Constituency, Kiambu County	Dietary diversity; DDS	Researcher administered Dietary diversity questionnaire (DDQ)	Continuous	Descriptive statistics Frequencies, Means Standard deviation
3. Identify the drivers of food choice (health, mood, sensory appeal, familiarity, weight control, price, convenience, and religion) among women aged 18-59 years in Kiambu Constituency, Kiambu County.	Drivers of food choice	Food choice questionnaire (FCQ)	Categorical	Descriptive statistics Frequencies, percentages
4. Assess the nutrition status of women aged 18-59 years in Kiambu County.	BMI Categories Waist circumference	Weight, Height, BMI Waist circumference	Categorical Continuous	Descriptive statistics Frequencies, percentages Mean
5. Determine the relationship between drivers of food choice and the nutrition status of women aged 18-59 years in Kiambu Constituency, Kiambu County.	Drivers of food choice BMI, WC	Drivers of food choice Weight, Height, BMI, WC	Categorical Categorical	Spearman's rho
6. $H0_1$ There is no significant relationship between drivers off food choice and dietary diversity of women aged 18-59 years in Kiambu Constituency	Drivers of food choice Dietary Practices (MDD-W met MDD-W)	FCQ, DDQ	Categorical Categorical	Multinominal logistical regression
7. $H0_2$ There is no significant relationship between drivers off food choice and nutrition status of women aged 18-59 years in Kiambu Constituency	Drivers of food choice BMI (BMI risk categories)	FCQ, BMI WC	Categorical Categorical	Multinominal logistical regression

3.13 Ethical considerations

This study received ethical clearance from the Kenyatta University Ethics Review Committee (KUERC) and was granted research authorization by the National Council for Science, Technology and Innovation (NACOSTI). The local administration in the study area was informed about the study. The potential hazards and benefits of participating in the study were thoroughly explained to the participants, who were enrolled only after providing both verbal and written informed consent (Appendix A). Confidentiality was ensured by omitting the names of respondents from the survey. To ensure the privacy, the data collected were securely stored in a locked cabinet, accessible only to the researcher. Participants whose nutritional status parameters were at risk were referred to the nearest health center.

CHAPTER FOUR: RESULTS

4.1 Introduction

The findings of this study are presented in this chapter in line with the objectives, which are displayed as tables and figures. Three hundred and eighty three 383 women completed the questionnaires, which translated to a 91.19% response rate. The chapter is divided into the subsequent headings;.

i. Socio-demographic and socioeconomic characteristics of women aged 18-59 years in Kiambu county
ii. Dietary diversity Socio-demographic and socioeconomic characteristics of women aged 18-59 years in Kiambu county
iii. Drivers of food choice of women aged 18-59 years in Kiambu County
iv. Relationship between drivers of food choice and nutrition status
v. Multivariate analysis on the drivers of food choice and nutrition status
vi. Multivariate analysis on the drivers of food choice and dietary diversity

4.2 Socio-demographic and economic characteristics of women aged 18-59 years in Kiambu County

4.2.1 Socio- demographic characteristics of women aged 18- 59 years in Kiambu County

Majority (43.9%) of the study participants fell in the 25-24 years age set (Table 4.2), with a mean age of 32.69 ±8.029. (Table 4.1). Most were married (63.7%), 27.5% were single and 8.9% combined were either widowed or divorced. Most of the participants

(82.1%),were Christians with most of them being Protestants (60.1%). Only 1.8% were Muslim, while 11.2% practiced other forms of religions (Table 4.1).

Table 4.1: Socio- demographic data of women aged 18- 59 years in Kiambu County

N=383	**Mean**	**Standard deviation**	**Variance**
Age (years)	32.69	8.029	64.258
Variable	**n**		**%**
Age groups			
18-24 years	66		17.2
25-34 years	168		**43.9**
35-44 years	118		30.8
45-59 years	31		8.1
Marital status			
Married	244		**63.7**
Single	105		27.4
Divorced	24		6.3
Widowed	10		2.6
Religion			
Catholic	60		15.7
Protestant	230		**60.1**
SDA	43		11.2
Muslim	7		1.8
Other religion	43		11.2

4.2.2 Economic characteristics of women aged 18- 59 years in Kiambu County

During the time of this study, only 11.7% of the population earned greater than ksh.30,000 per month. Conversely, 14.6% earned less than Ksh. 5000 per month (Table 4.3). Only

19.6% of the participants were formally employed, while peasant farmers and house wives made up 21.1% of the study participants (Table 4.2).

Table 4.2: Socio-economic characteristics of women aged 18- 59 years in Kiambu County

Variable (N=383)	n	%
Income		
<5000	56	14.6
5000-10000	54	14.1
10000-15000	62	16.2
15000-20000	56	14.6
20000-25000	47	12.3
25000-30000	63	16.4
>30000	45	11.7
Occupation		
Self-employed/ business person	71	18.5
Peasant farmer	77	20.1
Formal employment	75	19.6
Casual laborer	83	21.7
Housewife	77	20.1
Education level		
Secondary school	66	17.2
Tertiary education	79	20.6
University	79	20.6
Primary school	81	21.1

4.3 Dietary diversity of women aged 18-59 years in Kiambu County

The mean diversity of 5.67±1.89 was obtained. The food groups with the highest consumption were vitamin A rich fruits, and vegetables (94.8%), group of other vegetables (89.0%) other fruits (83.3%), grains, roots and tubers (77.3%). Those with the lowest consumption were eggs (17.5%) and group containing meat, poultry and fish (15.4%). (Figure 4.1). The proportion of women who met MDD-W was 51.4%.

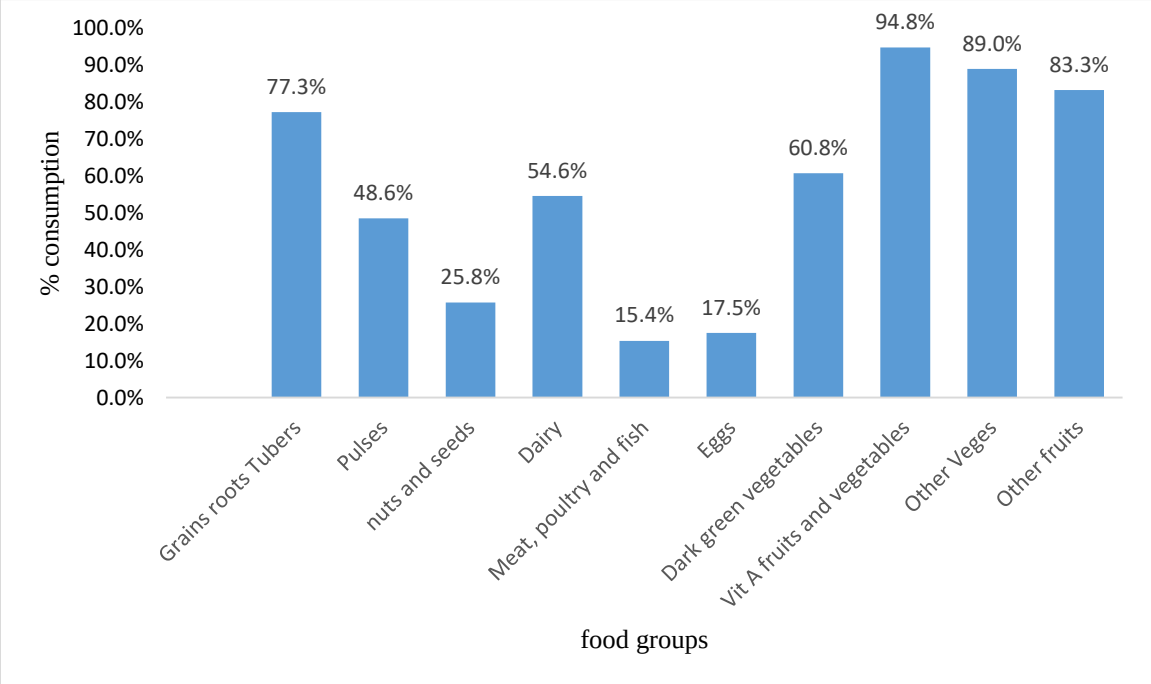

Figure 4.1: Percentage consumption of food among women aged 18-59 years in Kiambu County

4.3.1 Proportion of women aged 18-59 years meeting MDD-W vs socio-demographic and socioeconomic characteristics in Kiambu County

The dietary diversity was highest among those earning more than Ksh.30,000. This implied that the higher the income levels led to higher dietary diversity (Table 4.3). Dietary diversity was also highest in the 45-59 age groups. Interestingly, those who were divorced

and widowed had higher dietary diversity, 66.7% and 60.0% respectively, than those who were married (47.1%) or single (57.1%). The results of the chi square tests ranged from p= 0.060 – p= 0.934, implying that the association between diversity economic status and demographic profiles of the population was immaterial (table 4.3-Table 4.4).

Table 4.3: Marital status, income and occupation of study participants versus proportion (%) meeting dietary diversity

Variable	Met MDD-W(%)	Df	Chi square
Marital status			
Married	47.1	3	0.127
Single	57.1		
Divorced	**66.7**		
Widowed	**60.0**		
Income			
<5000	51.8	6	0.060
5000-10000	46.3		
10000-15000	46.8		
15000-20000	39.3		
20000-25000	57.4		
25000-30000	52.4		
>30000	**71.1**		
Occupation			
Self-employed/ business person	49.3	4	0.309
peasant farmer	**59.7**		
formal employment	**56.0**		
Casual Laborer	44.6		
House wife	48.1		

Table 4.4: education, religion and age groups of study participants versus proportion (%) meeting dietary diversity

Variable	Met MDD-W(%)	Df	Chi square
Education			
Secondary school	**54.5**	3	0.934
tertiary education	48.1		
University	**50.6**		
Primary school	**50.6**		
Religion			
Catholic	40.0	4	0.220
Protestant	53.9		
SDA	**60.5**		
Muslim	42.9		
Other religion	46.5		
Age groups			
18-24 years	53.0	3	0.445
25-34 years	48.8		
35-44 years	50.8		
45-59 years	**64.5**		

4.4. Drivers of food choice of women aged 18-59 years in Kiambu County

One hundred percent of the of the population (100%) reported that it was important to them that the food they ate could be bought close by while 94.3% felt that it was important to them that the food was easy to prepare (Table 4.5).

Table 4.5: Drivers of food choice (convenience, ethical concern, risk perception, familiarity and health) among women aged 18-59 year in Kiambu County

Variable (N=383)	n who responded yes	%
Convenience		
Is easy to prepare	361	94.3
Is easily available in shops	341	89.0
Can be cooked very simply	197	51.4
take no time to prepare	211	55.1
can be bought close by	**383**	**100.0**
Ethical concern		
is packaged in an environmentally friendly way	180	47.0
comes from the country I approve of	**208**	**54.3**
has certificates from the government	188	49.1
has the country origin clearly marked	197	51.4
Risk perception		
Is free from food scare	359	93.7
Is made from ingredients that i know	203	53.0
Is free from genetically modified	**371**	**96.9**
has a food label	176	46.0
Familiarity		
Is familiar	176	46.0
is like the food I ate when I was a child	177	46.2
Is what I usually eat	**377**	**98.4**
Health		
Is nutritious	**383**	**100**
contains a lot of vitamins and minerals	350	91.4
keeps me healthy	353	92.2
is good for my skin teeth hair	180	47.0
Is high in fiber	202	52.7

Most of the study population felt that food being free from GMOs was an important factor. Additionally, 93.7% felt that it was free from food scare was important to them. Additionally, majority of the population (98.4%) also reported that “is what I usually eat” was an important factor (Table 4.5). Seventy five percent (76.2%) of the population felt that religion was an important factor driving food choice while 100% considered food taste as a driver of food choice as an important part of the sensory appeal of food (Table 4.6).

Table 4.6: Drivers of food choice among women 18-59 years old in Kiambu County

Variable (N=383)	N who responded yes	%
Mood		
Cheers me up	177	46.2
helps me cope with life	191	**49.9**
keeps me awake	199	52.0
helps me relax	187	48.8
makes me feel good	181	47.3
Natural content		
Contains natural ingredients	198	51.7
Contains no additives	180	47.0
contains no artificial ingredients	191	49.9
Price		
Is not expensive	191	49.9
Is cheap	191	49.9
Is good value for money	207	54.0
Religion		
is permissible by religion	292	76.2
Sensory appeal		
smells nice	338	88.3
has a pleasant structure	189	49.3
looks nice	377	98.4
Taste good	**383**	**100.0**
Weight Control		
Is low in fat	189	49.3
helps me control my weight	178	46.5

Additionally, the aggregated percentage mean scores for the eleven (11) drivers of food choice across all the 41 variables was drivers were as shown in figure 4.2, where sensory appeal had the greatest aggregated percentage mean (84.0%), while mood and weight control had the lowest aggregated mean (48.84% and 47.9% respectively).

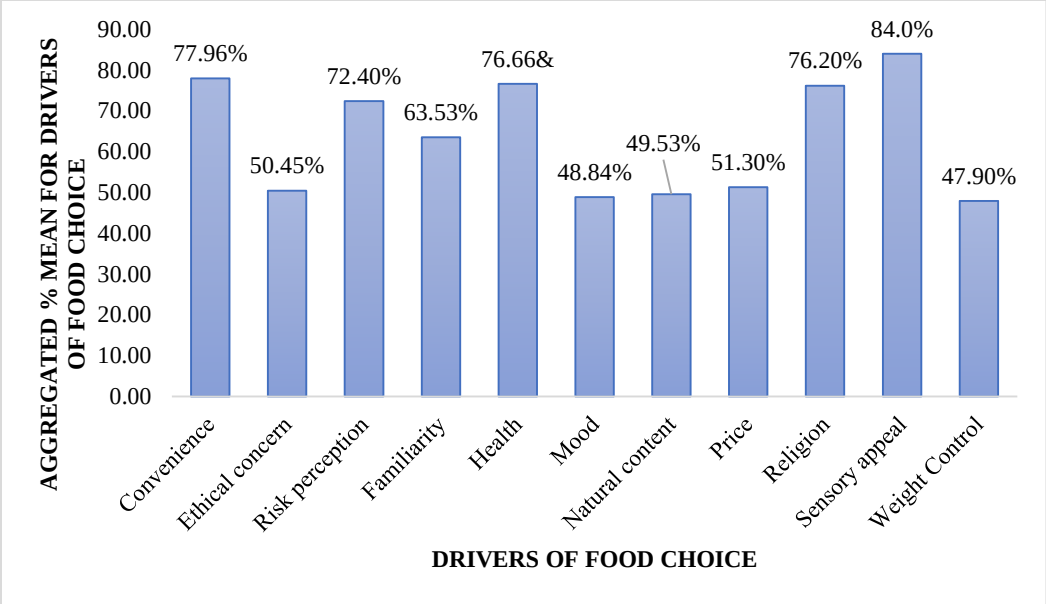

Figure 4.2 : Aggregated percentage means for the drivers of food choices among women aged 18-59 years in Kiambu County

4.4.1 Drivers of food choice across socio demographic factors among women aged 18-59 years in Kiambu County

4.3.1.1 Convenience versus socio demographic characteristics of women aged 18-59 years in Kiambu County

Marital status showed a notable correlation with factors of convenience as a driver of food choice (p= 0.000). Married women (100%) considered the ease of preparation followed by single women (99.0%) as factor in their food choices. One hundred percent (100%) of married women also felt that it was important to them that food was easily available in shops (p=0.000). In addition, there was also a strong association between food being easily available in shops and income levels (p= 0.031). There were no other associations all other factors of convenience studied and drivers of food choice, (Table 4.7).

Table 4.7: Factors of convenience versus socio demographic characteristics of women aged 18-59 years in Kiambu County

It is important to me that the food I eat is…	Yes (N=383)	Df	Chi square
CONVENIENCE			
Marital status *…easy to prepare			
Married	100.0%	3	0.000
Single	99.0%		
Divorced	41.7%		
Widowed	30.0%		
marital status*…easily available in shops			
Married	100.0%	3	0.000
Single	78.1%		
Divorced	54.2%		
Widowed	20.0%		
Income*…is easily available in shops			
<5000	96.4%	6	0.031
5000-10000	92.6%		
10000-15000	95.2%		
15000-20000	87.5%		
20000-25000	87.2%		
25000-30000	84.1%		
>30000	77.8%		

The FDG revealed diverse dietary habits among the participants based on their age, occupation, and lifestyle. Younger participants, such as the students and job seekers, tended to prioritize convenience and quick meals due to their busy schedules. "*I'm always looking for something quick, even if it's not the healthiest. I tend to eat the foods that I can get closest to my classes."* FGD participant $_6$, Kiambu (2020). This was in contrast to the study findings, where there was no association between age and convenience.

4.3.1.2 Ethical concern versus socio demographic characteristics of women aged 18-59 years in Kiambu County

The study found age to be significantly linked with packaging in an environmentally friendly ways as a factor of ethical consideration (p=0.041). This implied that there was a concern about how food was packaged, especially in the backdrop of the polythene paper ban, (Table 4.8).

Table 4.8: Ethical concern versus socio-demographic characteristics of women aged 18-59 years in Kiambu County

ETHICAL CONCERN			
It is important to me that the food I eat is…	**Yes (N=383)**	**Df**	**Chi square**
Age group* …packaged in an environmentally friendly way			
18-24 years	40.9%	3	0.041
25-34 years	41.7%		
35-44 years	57.6%		
45-59 years	48.4%		

4.3.1.3 Risk perception versus socio demographic characteristics of women aged 18-59 years in Kiambu County

Marital status had a strong association with both “is free from food scare” and “is free from genetically modified products” $p < 0.05$), (Table 4.9). This was possibly due to the scare surrounding the Sars-Cov2 pandemic. Married women were most inclined to take these factors into account when selecting foods (100%).

Table 4.9: Risk perception versus socio demographic characteristics of women aged 18-59 years in Kiambu County

RISK PERCEPTION			
It is important to me that the food I eat is…	**Yes (N=383)**	**Df**	**Chi-square**
Marital status*…free from food scare			
Married	100.0%	3	0.000
Single	81.9%		
Divorced	79.2%		
Widowed	100.0%		
marital status*…Is free from genetically modified products			
Married	100.0%	3	0.000
Single	100.0%		
Divorced	66.7%		
Widowed	60.0%		

4.3.1.3 Familiarity versus socio-demographic characteristics of women 18-59 years old in Kiambu County

Marital status was also linked to the factor of familiarity, reflected in the preference for "what I usually eat" (p=0.000) and "is made from ingredients I know", (p=0.043). Additionally, income was associated with is what I usually eat (P = 0.000), (Table 4.10).

Table 4.10: Factors of familiarity versus socio demographic characteristics of women aged 18-59 years in Kiambu County

FAMILIARITY			
It is important to me that the food I eat is…	**Yes (N=383)**	**df**	**Chi-square**
Marital status * …what I usually eat			
Married	100.0	3	0.000
Single	97.1		
Divorced	87.5		
Widowed	100.0		
Marital status*…made from ingredients I know			
Married	50.0	3	0.043
Single	63.8		
Divorced	37.5		
Widowed	50.0		
Income*…what I usually eat			
<5000	64.3	6	0.000
5000-10000	61.1		
10000-15000	77.4		
15000-20000	60.7		
20000-25000	46.8		
25000-30000	36.5		
>30000	48.9		

From the focus group discussion, one of the women reminisced that her mother (86 years) considered traditional vegetables animal feed and only cabbage as a vegetable. She reported that she, ensured that she had dark green traditional vegetables several times a week. "*My mother thought of traditional veggies animal fodder and weeds, unlike me. I ensure I have them regularly."*FGD participant$_1$, Kiambu, 2020.The women expressed their willingness to change their food choices under desirable conditions, such as access to fresh and nutritious ingredients, more time for meal preparation, and a higher budget. This reflects the dynamic nature of food preferences and the potential for individuals to adjust their choices based on favorable circumstances.

4.3.1.4 Mood versus socio demographic characteristics of women 18-59 years old in Kiambu County

Age was found to have an association with "cheers me up" as a factor of mood (p=0.048). The highest proportion that reported that important to them that food cheers them up was in the 18-24 years age group (56.1%). There was also an association between "makes me feel good" and religion (p = 0.017), Table 4.11.

Table 4.11: Mood versus socio-demographic characteristics of women 18-59 years old in Kiambu County

MOOD			
It is important to me that the food I eat is…	**Yes (N=383)**	**df**	**Chi-square**
age groups * …cheers me up			
18-24 years	56.1%	3	0.048
25-34 years	45.2%		
35-44 years	47.5%		
45-59 years	25.8%		
Religion * …makes me feel good			
Catholic	66.7%	4	0.017
Protestant	43.0%		
SDA	39.5%		
Muslim	57.1%		
Other religion	48.8%		

4.3.1.5 Price versus socio-demographic characteristics of women 18-59 years old in Kiambu County

Education levels were strongly associated with "is good value for money" as a factor of price (p=0.003). Respondents who had completed secondary education (66.7%) were more apt to regard this factor as influential in their food choice (Table 4.12).

Table 4.12: Factor of prices versus socio-demographic characteristics of women aged 18-59 years in Kiambu County

PRICE			
It is important to me that the food I eat is…	**Yes (N=383)**	**Df**	**Chi-square**
Education * …good value for money			
Secondary school	66.7%	3	0.003
Tertiary education	41.8%		
University	50.6%		
Primary school	46.9%		

The FGD participants valued feeling full and satisfied after meals, especially considering their busy lifestyles and price of the meals. "*Most days when I am in school, my go to snack is 'smocha' (smoked sausages with chapati). I like it because its filling and cheap, as opposed to healthy things like fruits, that when you eat, you get hungry immediately"(* FGD_2 participant, Kiambu, 2020).The women reported that they chose foods that could provide the most satiety at the most affordable price. Those that were employed were more likely to have more nutrient dense foods as snacks and lunch such as meat, vegetables and fish at the beginning of the month or "luxury foods" such as pizza and fried chicken at the beginning of the month. *"At the beginning of the month, there is a lot of money, even in business. That's the time I go out with friends and my children for pizza and treats. Toward the middle and end of the month, there is not so much money. I stay indoors or if I have to go out, I eat at cheaper hotels" (*FGD_3 participant, Kiambu, 2020). They were more likely to have carbohydrate only meals and snacks for example just mandazi or chapatti accompanied with tea towards the end of the month before the next pay date.

The only student in the FGD also reported the same patterns aligned to when they received their pocket money. The woman who was a housewife reported that she mostly ate what they prepared for the children, but also had a dietary pattern that changed as the month

went on, depending on the financial resources available to them. "*At the beginning of the month, Meat is regular even in my house but as we go on, my family and I eat a lot of legumes and vegetables"*FGDparticipant$_4$, Kiambu, 2020.

4.3.1.6 Sensory appeal versus socio demographic characteristics of women 18-59 years old in Kiambu County

"Has a pleasant structure" as a factor of convenience was associated with occupation was associated with occupation (p=0.015) (Table 4.13). Those who were formally employed were more inclined to select food based on the perceived structure (60.0%).

Table 4.13: Factors of sensory appeal versus socio demographic characteristics of women aged 18-59 years in Kiambu County

SENSORY APPEAL			
It is important to me that the food I eat…	**Yes (N=383)**	**Df**	**Chi-square**
Occupation*…has a pleasant structure			
Self-employed/ business person	35.2%	4	0.015
peasant farmer	42.9%		
formal employment	60.0%		
Casual laborer	50.6%		
Housewife	57.1%		

These findings were echoed in the FDG where most of the women revealed that they were apprehensive about trying new ingredients that they considered foreign, especially if the texture was new. For example, they considered okra and Jute Mallow (Mrenda) strange and slimy and were not willing to try them.*"I am not going to eat anything that feels like mucus"*FGD$_1$ participant, Kiambu, 2020.

4.3.1.7 Health concern versus socio demographic characteristics of women 18-59 years old in Kiambu County

Almost all members of the religions and denominations represented in this study felt that it was important to them that the food they are kept them healthy, with proportions ranging from 81.4% among the other religions, to 100% among Muslims (p=0.023) (Table 4.14).

Table 4.14: Health concern versus Religion of women 18-59 years old in Kiambu County

HEALTH CONCERN			
It is important to me that the food I eat…	**Yes (N=383)**	**Df**	**Chi-square**
Religion*…keeps me healthy			
Catholic	98.3%	4	0.023
Protestant	91.7%		
SDA	95.3%		
Muslim	100.0%		
Other religion	81.4%		

These findings were supported by the women in the FDG. Out of the 6 women, 5 admitted that their food habits changed since childhood. The older women felt that they made healthier choices when compared to their parents. The younger women aged 20 and 24 years also reported that their diet was different from their childhood diet as they consumed more junk food. Despite the shift in dietary patterns from childhood, all the women tended to stick to foods that were familiar to them.*"Having an opportunity to be out of home, I find myself eating all the foods that my parents did not let me eat regularly. Also, when I am hustling, I come home too tired to cook for myself and just eat junk"*FGD_4 participant, Kiambu, 2020.Participants acknowledged changes in their dietary habits over time due to various factors such as age, lifestyle, and health concerns. Some participants reported becoming more health-conscious, transitioning to healthier food choices as they aged.

4.5 Nutrition Status of women 18-59 years old in Kiambu County

Body mass index (BMI) and waist circumference served as measures of nutrition status. Mean BMI was 26.87 kg/m2 ± 3.541 (over weight). Additionally, mean WC was 86.766 cm± 12.989 (at risk) (Table 4.15).

Table 4.15: Mean BMI of women aged 18-59 years in Kiambu County

N=383	Mean	Std. Deviation
Weight (Kgs)	68.048	14.538
Height (m)	1.582	0.074
BMI (Kg/m^2)	26.870	3.542
	86.766	12.9895

In the study population, 63.9% were either overweight or obese, with only 36% being of normal BMI, (Table 4.16).

Table 4.16: Overweight and obesity prevalence by BMI among women in Kiambu County

Variable (N=383)	Description	Cut off points	n	%
BMI Risk Categories (kg/m2)	Normal	18.5-24.9	138	36
	Overweight	25.0-29.9	174	45.4
	obese (1)	30.0-34.9	71	18.5

Most of the study participants waist circumference fell with in the ‘at risk’ category (67.6%), while the rest were within normal WC (32.4%)(Table 4.17).

Table 4.17: Waist circumference risk categories of women aged 18-59 years in Kiambu County

Variable (N=383)	Description	Cut off points	N	%
WC risk category	not at risk	<80 cm	124	32.4
	At risk	>80cm	259	67.6

4.5.1 Socio demographic Characteristics versus Nutrition status of women aged 18-59 years in Kiambu County

4.5.1.1 Socio-demographic characteristics versus BMI of women aged 18-59 years in Kiambu County

Marital status was positively associated with BMI (p=0.045), implying that marital status may have an influence on lifestyle factors or access to resources that contribute to BMI. Occupation was also associated with BMI risk categories (p=0.014) possibly due to an increase in access to resources and sedentary lifestyles associated with formal employment. Those in formal employment had the highest levels of overweight (61%) and obesity (15%) combined (76%). Education level was however found to be associated with BMI risk categories (p=0.013). Those who received primary school education and primary school education were most likely to be overweight with 46% and 47% of each group reporting as overweight. Conversely, 29% of those having tertiary education and 26% of those with secondary education were likely to be obese (Table 4.18).

Table 4.18: BMI risk categories versus socio-demographic characteristics of women aged 18 – 59 years in Kiambu County

N=383	Normal (%)	Over-weight (%)	obese 1(%)	df	chi-square
Marital status					
Married	37	49	14	6	0.045
Single	34	42	24		
Divorced	38	29	33		
Widowed	30	30	40		
Occupation					
Self-employed / business person	27	45	28	8	0.014
peasant farmer	47	36	17		
formal employment	24	61	15		
Casual laborer	39	46	16		
Housewife	43	39	18		
Education Level					
secondary school	27	47	26	8	0.013
tertiary education	34	37	29		
University	44	41	15		
primary school	40	46	15		

4.5.1.2 Socio-demographic characteristics versus waist circumference of women aged 18-59 years in Kiambu County

A cross tabulation of WC risk categories and socio demographic characteristics revealed no significant associations ranging from p= 0.076 to p= 0.827 (Table 4.19). This implied that socio-demographic and economic characteristics surveyed in this study did not influence the WC of the study population.

Table 4.19: Socio-demographic characteristics versus waist circumference (WC) risk categories (RC) of women aged 18-59 years in Kiambu County

Socio demographic characteristics versus WC RC	df	chi-square
Marital status * WC RC	3	0.216
Income*WC RC	6	0.827
Occupation * WC RC	4	0.671
Education * WC RC	4	0.283
Religion * WC RC	4	0.789
age groups * WC RC	3	0.076

4.6 Relationship between drivers of food choice and nutrition status among women aged 18-59 years in Kiambu County

4.6.1 Relationship between drivers of food choice and BMI of women aged 18-59 years in Kiambu County

Using BMI as a proxy for nutrition status, this relationship was analyzed using Spearman's correlation coefficient (rho) (drivers of food choice versus BMI risk categories).“Having the country of origin clearly marked” and “contains no additives” were the only factors from the drives of food choice analyzed that correlated with BMI. The analysis suggested a very weak negative correlation that was statistically significant, rho = -0.121 (p=0.018) and rho=-0.137 (p = 0.007). Otherwise, no meaningful statistical link was observed between drivers of food choice and nutrition status, (Table 4.20).

Table 4.20: Relationships between drivers of food choice and nutrition status (BMI) of study participants

BMI VERSUS DRIVERS OF FOOD CHOICE (Spearman's rho)		N=383
It is important to me that the food I eat…		
Ethical concern		
…has the country origin clearly marked	Correlation Coefficient	-.121*
	Sig. (2-tailed)	0.018
	N	383
Natural content		
…Contains no additives	Correlation Coefficient	-.137**
	Sig. (2-tailed)	0.007
	N	383

*Significant value at $p \leq 0.05$

4.6.2 Relationship between drivers of food choice and waist circumference of women aged 18-59 years in Kiambu county

Additionally, analysis carried out using Spearman's correlation coefficient on drivers of food choice versus WC risk categories revealed weak associations, though statistically significant correlations between WC and is easily available in shops (rho = 0.344, p=0.000), is free from genetically modified products (rho=0.342, p=0.000), has a food label (rho=0.110, p=0.031) and is shat I usually eat (rho=0.240, p=0.000) (Table 4.21).

Table 4.21: Spearman's correlation coefficient of significant relationships between drivers of food choice and nutrition status (Waist circumference)

WC VERSUS DRIVERS OF FOOD CHOICE (Spearman's rho)		**N=383**
It is important to me that the food I eat is…		
Convenience		
…is easily available in shops	Correlation Coefficient	.344**
	Sig. (2-tailed)	0.000
	N	383
Risk perception		
…is free from genetically modified	Correlation Coefficient	.342**
	Sig. (2-tailed)	0.000
	N	383
…has a food label	Correlation Coefficient	-.110*
	Sig. (2-tailed)	0.031
	N	383
Familiarity		
…is what I usually eat	Correlation Coefficient	.240**
	Sig. (2-tailed)	0.000
	N	383

**. Significant at the 0.01. * Significant at the 0.05

4.7 Multivariate regression analysis on the relationship between drivers of food choice and nutrition status of women aged 18-59 years in Kiambu County

Multivariate logistical regression was done on all drivers of food choice simultaneously to show the link between drivers of choice of food and nutrition status. Socio demographic characteristics were used as confounding variables. The following hypotheses were tested.

H_{01} There is no significant relationship between drivers of food choice and the dietary diversity of women aged 18-59 years in Kiambu County.

H_{02} The drivers of food choice have no significant relationship with the nutrition status of women aged 18-59 years in Kiambu County.

The model fit revealed that drivers of food choice did not significantly predict neither the BMI categories or the WC risk categories of the study participants, hence no significant relationship between drivers of food choice and nutrition status (BMI risk categories and WC risk categories) was found among women aged 18-59 years in Kiambu County p= 0.170 and p=0.921 This is as presented in table 4.22.

Table 4.22: Model fit of drivers of food choice versus nutrition status (Body mass index categories and waist circumfrence risk categories) of women aged 18-59 years

Likelihood Ratio Tests

N=383 Drivers of food choice	Chi-Square	df	Sig.
Drivers of food choice versus BMI risk categories	94.093	82	0.170
Drivers of food choice versus WC risk categories	28.959	41	0.921

4.7.1 Multivariate regression analysis on the relationship between drivers of food choice and dietary diversity of women aged 18-59 years in Kiambu County

The model fit form the multivariate regression analysis revealed that drivers of food choice did not significantly predict the dietary diversity of participants. Therefore, there was no significant relationship between the drivers of food choice and dietary diversity with (P=0.308) as shown in Table 4.23.

Table 4.23: Model fit of drivers of food choice versus dietary diversity (met minimum dietary diversity for women) of women aged 18-59 years

Likelihood Ratio Tests

N=383 Drivers of food choice	Chi-Square	df	Sig.
Drivers of food choice versus Met MDD-W	45.008	41	0.308

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1. Discussion

This chapter provides a discussion of the findings of this study guided by the study objectives. It further analyses the participants' socio-economic and demographic characteristics, their drivers of food choices, dietary diversity, nutritional status, and the statistical associations found among these variables.

5.1.1 Socio-demographic factors and dietary diversity of women aged 18-59 years in Kiambu County

On average, the dietary diversity score for the population stood at 5.67±1.89, this was close to what was found by (Chege et al. 2021) in Kenya where the MDD-W was a mean of 5.6. (Onyeji & Sanusi, 2020) found an Overall Dietary Diversity Score (DDS) of 7.0 ± 1.8 when assessing women of reproductive age in Nigeria. In Tanzania, Bellows et al. (2020) found that the average dietary diversity score for women was 3.00. In the Kenyan context, a mean dietary diversity score of 5.75 ± 1.9 was found in this study indicating a moderate level of dietary diversity among the participants. In contrast, (Gitagia et al. 2019)found dietary diversity scores were (3.78 ± 0.99) and (3.84 ± 1.05) in weak agro-ecological zones and ecological zones, respectively. In contrast, Kiboi et al.(2017) found that the mean Dietary Diversity Score (DDS) of women in Laikipia County was 6.84 ± 1.46 SD. This suggests that dietary diversity scores may vary between studies and populations due to a variety of factors, including education level, education level, age and family size(Gitagia et al. 2019).

5.1.2 Nutrition status of women aged 18-59 years in Kiambu County

In the current study BMI only 36% of the women had normal BMI. The rest of the women were either overweight or obese categories, (45.4% and 18.5%). The mean BMI was 26.87 kg/m^2, while the mean waist circumference was 86.77 cm. Most of the study participants

had a waist circumference falling within the 'at-risk' category (67.6%), while the rest had a normal waist circumference (32.4%). In comparison, Mbuthia et al. (2023) found an obesity prevalence of 28.8% (95% CI, 26.7%-30.9%) among women.

The current study there were significant association between BMI and marital status (P = 0.045), occupation (P = 0.014), and education level (P = 0.013). Prior research suggest that married adults tend to have a higher BMI compared to unmarried persons (Mata et al. 2015). However, Liao et al. (2018) noted a relationship between marital status and BMI is influenced genetically and environmental factors, particularly in females.

Occupation was also found to be linked to BMI in the current study. Hadgraft et al. (2015) observed that white-collar occupations were associated with higher levels of occupational sitting time, which, in turn, was interconnected with higher BMI. In line with this, the current study revealed that 76% of participants in formal employment were either overweight or obese.

Additionally, education level was found to impact BMI. Benhamza et al. (2020) reported a significant relationship between education level and BMI in Algerian women, with lower education levels related to with higher BMI. Rachele et al. and Habib et al. (2022) found that knowledge levels about physical activity and BMI differed based on education level, highlighting the role of education in shaping attitudes and practices related to BMI.

5.1.3 Drivers of food choice of women aged 18-59 years in Kiambu County

A study exploring food taboos and cultural beliefs among pregnant women in South Africa's Eastern Cape by Chakona & Shackleton, (2019) revealed that cultural practices significantly influenced food consumption patterns. In addition, research indicates that

cultural beliefs and taboos often lead to the avoidance of specific food groups, including meats such as fish, eggs and other animal products, legumes like beans, starchy foods such as potatoes, and vegetables like squash and pumpkins. (Chakona et al.2019). This consistent with results reported in this study in which participants expressed a preference for foods that were familiar to them (98.4%) and considered taste as an important factor in their choice of food (100%). Kroll et al. (2019) when investigating the obesity-promoting food environments in South Africa and Ghana, the study found that South Africa experienced a more advanced food transition compared to West Africa. They found that the home food environment in South Africa was also identified as contributing more significantly to obesity with it being higher in high calorie, convenience foods. This is in line with what was found in the current study where 100% of the participants chose “can be bought close by” as a convenience factor that drives their food decisions. However, it's important to note that the study focused on the obesity-inducing environment rather than the specific factors of food choice.

In addition, Holdsworth & Landais (2019) discussed the influence of social factors on food choices in Africa. They found that reflecting eating habits to please others or signal identity and norms, as well as considerations related to family preferences and household social status, were important factors in food selection. This is similar to what was found in the current study, where 98.4% of the respondents chose “is what I usually eat “as a factor of familiarity that drivers their food choice. This highlights the importance of considering social and cultural factors when considering the eating habits and preferences of African people.

5.1.4 The relationship between drivers of food choice and nutrition status of women aged 18-59 years in Kiambu Constituency

The findings of this study revealed a weak yet statistically significant association between clear country-of-origin labeling and the absence of additives. Among others, no significant relationship was found between food choice drivers and nutritional status of women aged 18-59 in Kiambu Constituency, Kiambu County. In comparison, several studies have examined food choice factors and their impact on the nutritional status of different population groups. A study conducted among college students in Addis Ababa, Ethiopia, identified various factors that influenced food choices, such as mood, health considerations, sensory appeal, cost, convenience, and familiarity. (Berhanu et al. 2023). These factors were found to significantly influence food choices and were positively correlated with nutritional status. Also, another study conducted on lactating women in Debre Birhan, Ethiopia found that motivation, price and mood to eat a healthy meal were important factors in food choice and influenced nutritional status (Kibr, 2020). However, it is important to note that not all food choice factors are positively correlated with nutritional status. For example, a study conducted in rural Solomon Islands found that factors influencing food choice, such as food availability, affordability, and education, were important determinants of dietary outcomes (Albert et al. 2020). Overall, the relationship between factors influencing food choice and nutritional status is complex and can vary depending on the population and the factors being studied. Factors such as mood, health concern, sensory appeal, price, convenience and familiarity have been identified as food choice factors that can positively influence nutritional status (Berhanu et al. 2023; Kibr, 2020). However, other factors such as food availability, affordability and education can also influence nutritional outcomes (Albert et al. 2020). Additional research is required

to gain a deeper understanding of how food choices relate to nutritional status across diverse population settings. There is also a need for more focused research that examines specific food groups and individual foods within those groups, aiming to clarify the factors influencing these choices and their connection to nutritional status.

5.1.5 The relationship between drivers of food choice and the dietary diversity of women aged 18-59 years in Kiambu Constituency, Kiambu County

This study showed a slight yet meaningful inverse relationship between food being easy to prepare, free from food scare and free from genetically modified products, having a pleasant structure, and dietary diversity. This suggests that there is a small possibility that dietary diversity reduces when an individual takes into account these factors. Several studies have examined this relationship and provided insights into the drivers of dietary diversity. One study conducted among street food consumers in Oyo, Nigeria, found a noteworthy association variety of foods consumed and overall nutritional status. (Leshi&Leshi, 2017). Individuals with low dietary diversity were much likely to have poor nutrition, while those with high dietary diversity had better nutritional status (Leshi&Leshi, 2017). This suggests a positive correlation between drivers of food choice, such as dietary diversity, and nutritional status. Another study conducted among children in Somalian IDP camps also highlighted the importance of dietary diversity in achieving appropriate nutritional status (Marcantonio et al. 2020). The study highlighted that dietary diversity is linked to nutrient adequacy and supports optimal nutritional status across various populations and settings. This further supports the notion that dietary diversity, can have a positive impact on nutrition. Furthermore, a study conducted in India examined the drivers of dietary diversity among farmer households and found regional differences in these drivers (Singh et al. 2020). The study highlighted the importance of considering regional

factors when examining the relationship between drivers of food choice and dietary diversity. This suggests that the impact on dietary diversity can vary depending on the specific region and context. Overall, the available evidence suggests a positive correlation between drivers of food choice, such as dietary diversity, and nutrition status. Research have consistently shown that high dietary diversity is associated with better nutrition (Leshi&Leshi, 2017; Marcantonio et al. 2020). However, it is essential to take into account regional variations and contextual factors when exploring this relationship, since drivers of food choice and dietary diversity can be influenced by various factors and contexts. (Singh et al. 2020).

5.1.6 Summary of major findings

This study employed a cross-sectional design, with the primary aim of identifying the drivers influencing food choice, nutritional status, and dietary diversity among women aged 18 to 59 years in Kiambu County.

Most of the study participants (43.9%) fell within the 25–34 year age group with their mean age being 32.69 years. Two hundred and forty of (63.7%) were married and majority reported that they were Christians (60.1%). Only 11.7% of the study participants made more than Ksh. 30,000, with the highest proportion of participants (16.4%) making between Ksh. 25,000 Ksh. 30,000. Additionally, 21.7% reported that that were casual labourers while 19.96% were formally employed. Furthermore, those with university education and tertiary education were tied at 20.6% each.

The MDD-W for the participants in this study was 5.67±1.89. Vitamin A rich foods were the food group with the highest consumption with 77.3% while only 17.5% and 15.4% of the study population consumed eggs and meat poultry and fish respectively. Those with a

higher income (>Ksh. 30,000) tended to have greater dietary diversity; however, the association between income and dietary diversity was not statistically significant. This relationship was also not statistically significant across the socio demographic and economic characteristics assessed (P=0.06 – P=0.934).

The study population (100%) considered the factors such as “can be bought close by” and “tastes good” as important factors when they considered their food choices. A weak correlation was observed between marital status and convenience as a driver of food choice (p=0.000), with 100% of married women considering availability in shops and ease of preparation as a factor of food choice. Food being easily available in shops was also associated with income levels (P=0.031).

Furthermore, there was a weak association between environmentally friendly packaging and the age of the participants, (P=0.041). Among participants aged 35–44 years, 57% expressed the strongest concern regarding the ethical packaging of their food. Additionally, being from GMOs and free from food scare was associated with marital status (p=0.000). This was the same for the relationship between is what I usually eat versus marital status and “is what I usually eat” versus income. Keeps me healthy also had a strong association with religion (P = 0.023), with 100%.

Mean weight of the respondents was 68.04 Kgs ±14.538 and that of their BMI was 26.87 kg/m^2. Only 36% of the respondents had a BMI classed as normal, with the rest being either overweight or obese. In addition, 67.6% of the women were considered at risk with a WC greater than 80 cm. The mean WC was 86.76 cm which also was within the at risk category.

“Having the country of origin clearly marked” and “contains no additives” were the only factors from the drives of food choice analysed that suggested a weak negative correlation that was statistically significant with BMI, rho = -0.121 (p=0.018) and rho=-0.137 (p=0.007). No other statistically significant associations were identified between food choice drivers and nutritional status. Additionally, Spearman's correlation coefficient (rho) was employed to assess the relationships between food choice drivers and waist circumference (WC) risk classifications. Weak spurious correlations were identified between WC and being easily available in shops, (rho = 0.344, p=0.000), freedom from genetically modified ingredients (rho = 0.342, p=0.000), presence of a food label (rho = 0.110, p=0.031) and is what I usually eat (rho = 0.240, p=0.000). These correlations were possibly due to chance and not indicative of causal associations.

5.2 Conclusions

The study population consisted mainly of young individuals, with an average age of 32.69 years (±8.09), with most of them being married (63.7%), The participants were economically, diverse though only 11.7% made more than Ksh. 30,000. Most women were casual labourers 21.7%, with 21% having only a primary school education.

This study found that food choice among women is influenced by convenience, familiarity, and availability, not just affordability. Sensory appeal, religion, health, and convenience were key driver of food choice. Marital status had a statistically significant relationship with ease of preparation, availability, freedom from food scare and freedom from genetically modified products and familiarity as drivers of food choice. Age was corelated with food being packed in an environmentally friendly way, with those aged between 35 – 44 years answering yes to the question on the importance of food being packed in and

environmentally friendly way. Age was also correlated with mood where participants answered positively to the question on the importance of food cheering them up. Furthermore, income had a statistically significant relationship with familiarity, as well as ease of availability in shops.

The study also found that the mean dietary diversity score (MDD-W) was 5.67±1.89 among women aged 18-59 years in Kiambu county. Vitamin A-rich foods were the most consumed and socio demographic and economic characteristics did not significantly influence dietary diversity, with 49% of the women consuming less than 5 of the food groups assessed.

Additionally, it was found that a large number of the participants (63.9%) were overweight or obese with a mean BMI of 26.87cm and mean waist circumference was 86.76 cm this indicated that there was need for further public health intervention to tackle the rising prevalence of overweight and obesity in the county, hence reducing the risk of NCDs.

When the associations between drivers of food choice and nutrition status, "country of origin" and "no additives" as factors of risk perception were the only food choice factors that had weak, though significant association with BMI. Waist circumference was associated with factors like availability, absence of GMOs, food labelling (risk perception), and alignment with usual eating preferences (familiarity). These associations were weak, suggesting a by chance association, as opposed to a causal relationship.

The study postulated two null hypotheses where drivers of food choice have no significant relationship with the dietary diversity of women aged 18-59 years in Kiambu County and that the relationship between drivers of food choice and the nutrition status of women aged 18-59 years in Kiambu County is not significant. Both null hypotheses were not rejected,

suggesting that the observed patterns regarding the drivers of food choice and nutritional status as well as dietary diversity may be influenced by factors not captured in this study.

5.3 Recommendations

5.3.1 Recommendations for policy

1. There is need for the MoH to continue to develop disseminate clear and culturally appropriate dietary guidelines that emphasize the need for dietary diversity in the population.
2. These guidelines should not only emphasize the importance of dietary diversity but also take into consideration the diverse factors influencing food choices within the population.

5.3.2 Recommendations for practice

Nutrition and dietetics practitioners should adopt personalized approach to nutrition counseling interpreting food choice driver screening at an individual level since individual factors play a more significant role in influencing food choices and nutrition status. They should seek to understand each individual's unique circumstances, preferences, and drivers of food choices, and tailor interventions accordingly.

5.3.3 Recommendations for further research

The following areas are recommended for further research.

1. Longitudinal studies to track changes in dietary diversity and food choice drivers to assess seasonal variations and other temporal factors that influence food choices.

2. Targeted investigations focusing on specific food groups and individual items can help clarify the determinants of these choices and their impact on overall nutritional well-being.
3. Studies that explore how different physiological stages in a woman's life, such as adolescence, pregnancy, lactation, and menopause affect food choices and nutritional status including an emphasis on specific meals and nutrient requirements during each stage.

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APPENDICES

APPENDIX A: INFORMED CONSENT

Introduction

My name is…… I am a researcher from Kenyatta University. I am conducting a study on "Drivers of food choice, dietary diversity and Nutrition status of women aged 18-59 in Kiambu County." I am seeking your consent to participate in this study whose findings might be beneficial to you.

Study procedure

This Study was carried out using a questionnaire where you will be asked questions about your food habits and what motivates these habits. Your weight and height will also be taken.

Benefits

Though there are no direct benefits to this study, participating will give you an awareness of your nutrition status which can inform your future nutrition and food choice.

Risks

There are no risks associated with participating in this study.

Voluntary participation

Participation in this study is voluntary and should you feel the need, you are allowed to withdraw consent at any point.

Confidentiality

Any information provided by you was treated with utmost confidentiality and will only be used for purposes of this study.

Contact information

Should you have any questions regarding this you are welcome to contact me using the contact details given:

Name: Christine Muturi

Mobile Number: 0723339235

Email: **christinewmuturi@gmail.com**

If you have any questions, you may contact my research supervisors: Prof. Judith Waudo on +254720967985 and Dr. Eunice Njogu on +254722862052

You may also contact Kenyatta University Research Ethic Committee Secretariat on chairman.kuerc@ku.ac.ke, secretary.kuerc@ku.ac.ke, secretariat.kuerc@ku.ac.ke

Participant's Statement (over 18 years)

The above information regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that my records was kept private and that I can leave the study at any time.

Name:_____ (optional) _____(Sig

Investigator's statement

I, the undersigned, have explained to the volunteer, in a language s/he understands, the procedures to be followed in the study and the risks and benefits involved.

Name of Interviewer……..

APPENDIX B: QUESTIONNAIRE

QUESTIONNAIRE ON DRIVERS OF FOOD CHOICE, DIETARY DIVERSITY AND NUTRITIONAL STATUS AMONG WOMEN

Village…….

Serial No…….

SECTION I: SOCIO-DEMOGRAPHIC AND GENERAL INFORMATION		
ADMINISTRATIVE DETAILS (All sections to be completed by the interviewer)		
1	Questionnaire ID NO	
2	Date of Interview	
3	Questionnaire checked	□ Yes
4	Date checked:	
5	Please indicate your country and/or province/ County of residence	
01: Personal information		
6	Kindly tick (√) or write, where applicable, in the spaces provided	
7	Marital status	**1.** Married **2.** Single **3.** Divorced **4.** Widowed
8	What is your age in years?	
9	Which of the categories best represents your monthly income (Ksh)?	1. Below 5,000 2. 5,000-10,000 3. 10,000-15,000

		4. 15,000-20,000 5. 20,000-25,000 6. 25,000-30,000 7. >30,000		
10	What is your occupation?	1. Self employed/Business person 2. Peasant farmer 3. Formal Employment **4.** Casual Laborer **5.** House wife		
11	. What is your highest level of education?	1. Primary 2. Secondary 3. Tertiary 4. University		
ANTHRPOMETRICS				
	Height In meters	1st Reading	2nd Reading	Average
	Weight in Kg	1st Reading	2nd Reading	Average

SECTION II: FOOD CHOICE QUESTIONNAIRE		
Several different factors influence our choice of food. For every person, there was a different set of factors that is important. In the next set of questions, we are interested in finding out what factors influence your choice of food. Listed below are a series of factors that may be relevant to your choice of foods. Read each item carefully and decide how important the item is to you. Put a tick in the box that best reflects your feelings. Remember, there are no right or wrong answers - we are interested in what is important to you.		
It is important to me that the food I eat on a typical day:	Yes (1)	No (0
1. Is easy to prepare		
2. Contains no additives		
3. Is low in calories		
4. Taste good		
5. Contains natural ingredients		
6. Is not expensive		
7. Is low in fat		
8. Is familiar		
9. Is high in fiber		
10. Is nutritious		
11. Is easily available in shops/supermarkets		
12. Is cheap		
13. Cheer me up		
14. Smells nice		
15. Can be cooked very simply		
16. Helps me cope with life		

17. Helps me control my weight		
18. Has a pleasant structure		
19. Is packaged in an environmentally friendly way		
20. Comes from the country I approve officially		
21. Has certifications from the government		
22. Is permissible by religion		
23. Is like the food I ate when I was a child		
24. Contains a lot of vitamins and minerals		
25. Contains no artificial ingredients		
26. Keeps me awake		
27. Looks nice		
28. Helps me relax		
29. Is high in protein		
30. Takes no time to prepare		
31. Keeps me healthy		
32. Is good for my skin/teeth/hair/nails/etc.		
33. Makes me feel good		
34. Has the country origin clearly marked		
35. Is what I usually eat		
36. Can be bought in shops close to where I live/work		
37. Is good value for money		
38. Is free from genetically modified products		

39. Is made from ingredients that I know		
40. Is free from "food scare"		
41. Has a food label		

Please make sure you have answered every item.

SECTION III: DIETARY DIVERSITY QUESTIONNAIRE

Please list the foods (meals and snacks) you had both inside and outside of your home yesterday during the day and night. Commence with the first meal consumed in the morning. Note every meal and beverage that the respondent stated. Once the respondent is done, follow up to find out if they mentioned any meals or snacks.

Breakfast	
Snack	
Lunch	
Snack	
Dinner	
Other	

When the respondent recall is complete, fill in the food groups based on the information recorded above. For any food groups not mentioned, ask the respondent if a food item from this group was consumed.

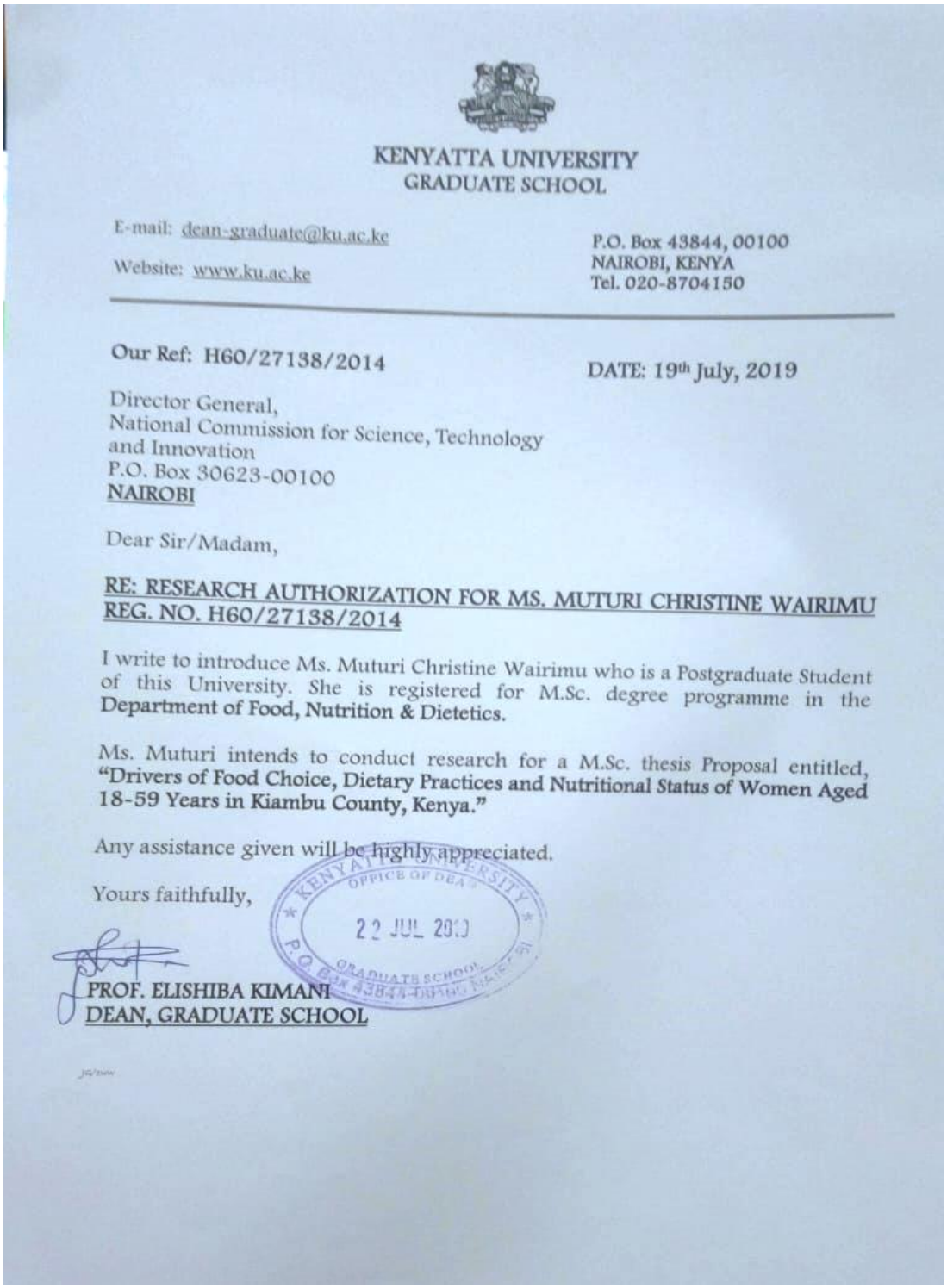
Question Number	Food Group	Examples	YES=1 NO=0
1	Grains, white roots and tubers and plantains	Corn/maize, rice, wheat, sorghum, millet or any other Grains or foods made from these (e.g. Bread, noodles, Porridge or other grain products). Ugali, porridge or pastes, white potatoes, white yam, white cassava, or other foods Made from roots, plantains	
2	Vitamin A rich Vegetables and fruits	Pumpkin, carrot, squash, or sweet potato that are orange Inside, Red sweet pepper, Ripe mango, ripe Papaya, dried peach, and 100% fruit juice made from these fruits	
3	Dark Green Leafy Vegetables	Dark green/leafy vegetables, including wild forms + Locally available vitamin A rich leaves such as Amaranth, cassava leaves, kale, spinach	
4	Other Vegetables	Other vegetables (e.g. Tomato, onion, eggplant) + other Locally available vegetables	
5	Other fruits	Other fruits, including wild fruits and 100% (+ fruit juice Made from these fruits)	
6	Meat, poultry and fish	Beef, pork, lamb, goat, rabbit, game, chicken, duck, Other birds, insects, liver, kidney, heart or other organ meats or blood-based Foods	
7	Eggs	Eggs from chicken, duck, guinea fowl or any other egg	
8	Pulses (beans, peas and lentils	Dried beans, dried peas, lentils, nuts, seeds or foods Made from these (e.g. Hummus, peanut butter)	
9	Dairy	Milk, cheese, yogurt or other milk products	
10	Nuts and seeds	Ground nuts, peanuts, certain seeds or nuts or butters made from these	

APPENDIX C: FGD GUIDE

Question	Probe
1. Please explain about all kinds of foods that you consumed daily.	-Consumed foods at weekend and during the week - Snacks - Dietary habits
2. What are your criteria for selecting foods?	How big of a factor is satiety
3. How much do you eat and what do you eat when you are happy, sad or angry?	
4. What is your opinion about religiously acceptable and unacceptable foods?	
5. Please tell us about your parents' dietary habits.	Method to prepare foods - Food resources Childhood favorites
6. Has your dietary habits changed since childhood?	If your answer is yes, please clarify the time and kind of changes.
7. What are the reasons of dietary habit changes?	
8. What are the factors induced to not choose your favorite foods?	
9. If the condition is desirable, will there be changes in your choices?	
10. What are your food choices in special occasions like Christmas/ Easter?	Kinds of foods - Amounts of foods
11. How are your food choices in various seasons?	Kinds of foods - The reasons of selections
12. In instances where you eat out, what influences your choice if restaurant/ food	Portions Do you eat everything provided Do you ask for more?
12. Is there any person whose opinion is	Who and what

important for you to choose foods?	
13. How are your food choices in various situations in terms of time and place?	Regularity - Place and persons which are with you
14. What is your opinion about local and traditional foods?	

APPENDIX D: RESEARCH AUTHORIZATION



KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Our Ref: H60/27138/2014

DATE: 19th July, 2019

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MS. MUTURI CHRISTINE WAIRIMU
REG. NO. H60/27138/2014

I write to introduce Ms. Muturi Christine Wairimu who is a Postgraduate Student of this University. She is registered for M.Sc. degree programme in the **Department of Food, Nutrition & Dietetics.**

Ms. Muturi intends to conduct research for a M.Sc. thesis Proposal entitled, **"Drivers of Food Choice, Dietary Practices and Nutritional Status of Women Aged 18-59 Years in Kiambu County, Kenya."**

Any assistance given will be highly appreciated.

Yours faithfully,

KENYATTA UNIVERSITY OFFICE OF DEAN 22 JUL 2019 GRADUATE SCHOOL P.O. BOX 43844-00100 NAIROBI

PROF. ELISHIBA KIMANI
DEAN, GRADUATE SCHOOL

APPENDIX E: ETHICAL CLEARANCE LETTER (PAGE 1)

KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575
Email: kuerc.chairman@ku.ac.ke

Website: www.ku.ac.ke

P. O. Box 43844,
Nairobi, 00100
Tel: 8710901/12

Our Ref: KU/ERC/ APPROVAL/VOL.1 /9 Date: 6th September, 2019

Muturi Christine Wairimu
P.O Box 43844, 00100
Nairobi.

Dear Ms. Muturi,

APPLICATION NUMBER: PKU/1065/11115 DRIVERS OF FOOD CHOICE, DIETARY PRACTICES AND NUTRITION STATUS OF WOMEN AGED 18-59 YEARS IN KIAMBU COUNTY, KENYA

1. **IDENTIFICATION OF PROTOCOL**

The application before the committee is with a research topic **"Drivers Of Food Choice, Dietary Practices And Nutrition Status Of Women Aged 18-59 Years In Kiambu County, Kenya"**. Received on 31st July, 2019 and discussed on 13th August, 2019

2. **APPLICANT**

Muturi Christine Wairimu

3. **SITE**

Kiambu County, Kenya

4. **DECISION**

The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines and **APPROVED that the research may proceed for a period of ONE year from 13th August, 2019.**

APPENDIX E: ETHICAL CLEARANCE (PAGE 2)

5. **ADVICE/CONDITIONS**

i. Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.
ii. Serious and unexpected adverse events related to the conduct of the study are reported to this committee immediately they occur.
iii. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.
iv. Submit an electronic copy of the protocol to KUERC.

When replying, kindly quote the application number above.
If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ERC a copy of the letter.

KENYATTA UNIVERSITY
OFFICE OF THE CHAIRMAN
11 SEP 2019
ETHICS REVIEW COMMITTEE
P.O. BOX 43844 - 00100 NAIROBI

Dr. Peterson Warutere
AG. CHAIRMAN - ETHICS REVIEW COMMITTEE

I Mukiri Christine Wairimu ...accept the advice given and will fulfill the conditions therein.

Signature..... Dated this day of..11th September,..... 2019.

cc.
DVC-Research Innovation and Outreach

APPENDIX F: RESEARCH PERMIT

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **954266**

Date of Issue: **26/September/2019**

RESEARCH LICENSE

This is to Certify that Ms.. Christine Muturi of Kenyatta University, has been licensed to conduct research in Kiambu on the topic: DRIVERS OF FOOD CHOICE, DIETARY PRACTICES AND NUTRITION STATUS OF WOMEN AGED 18-59 YEARS IN KIAMBU COUNTY, KENYA for the period ending : 26/September/2020.

License No: **NACOSTI/P/19/1564**

954266

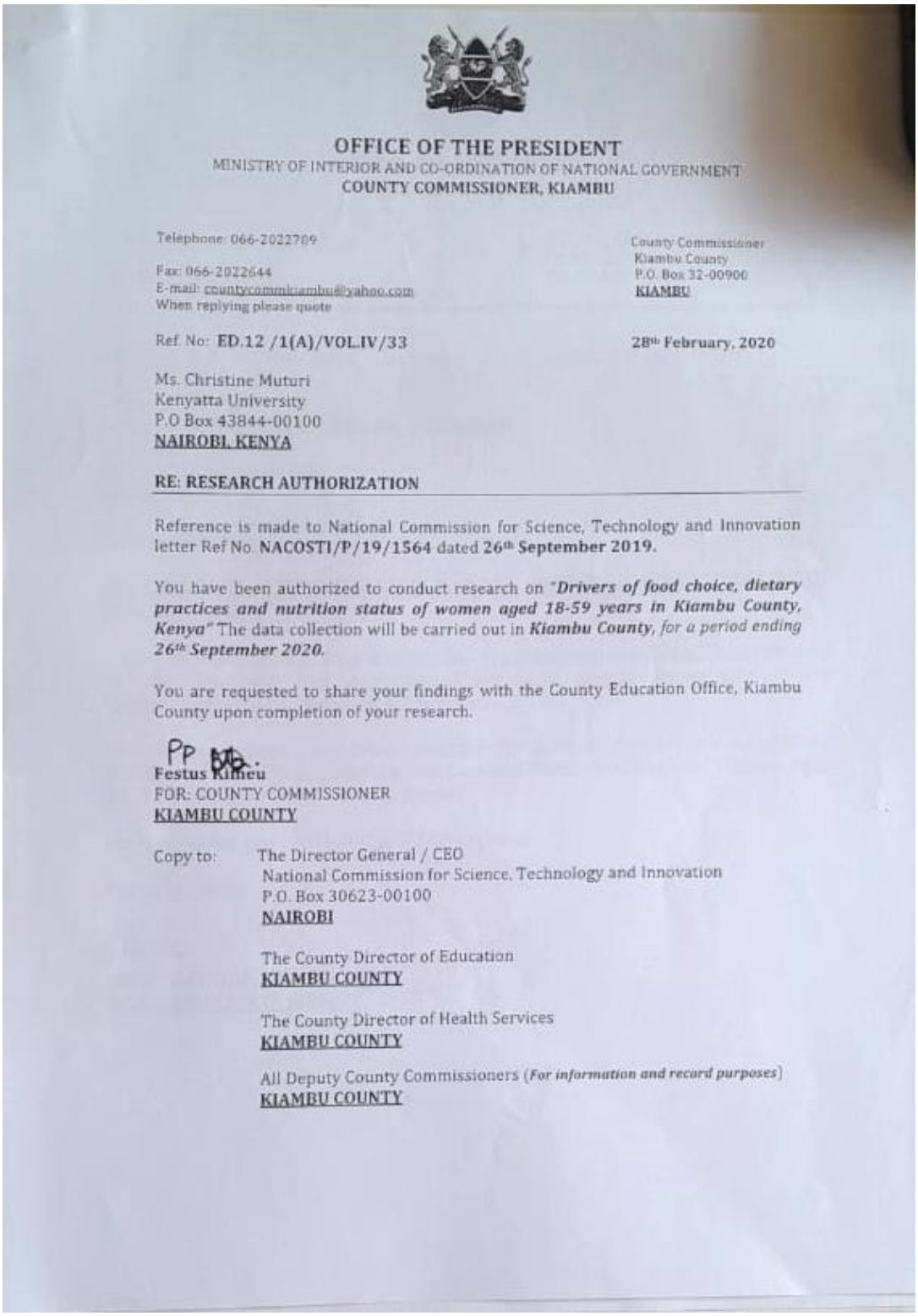
Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

APPENDIX G: LETTER OF AUTHORIZATION BY KIAMBU COMMISSIONER



OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND CO-ORDINATION OF NATIONAL GOVERNMENT
COUNTY COMMISSIONER, KIAMBU

Telephone: 066-2022709
Fax: 066-2022644
E-mail: countycommkiambu@yahoo.com
When replying please quote

County Commissioner
Kiambu County
P.O. Box 32-00900
KIAMBU

Ref. No: **ED.12 /1(A)/VOL.IV/33**

28th February, 2020

Ms. Christine Muturi
Kenyatta University
P.O Box 43844-00100
NAIROBI, KENYA

RE: RESEARCH AUTHORIZATION

Reference is made to National Commission for Science, Technology and Innovation letter Ref No. **NACOSTI/P/19/1564** dated **26th September 2019.**

You have been authorized to conduct research on ***"Drivers of food choice, dietary practices and nutrition status of women aged 18-59 years in Kiambu County, Kenya"*** The data collection will be carried out in ***Kiambu County,*** *for a period ending* ***26th September 2020.***

You are requested to share your findings with the County Education Office, Kiambu County upon completion of your research.

PP
Festus Kimeu
FOR: COUNTY COMMISSIONER
KIAMBU COUNTY

Copy to: The Director General / CEO
National Commission for Science, Technology and Innovation
P.O. Box 30623-00100
NAIROBI

The County Director of Education
KIAMBU COUNTY

The County Director of Health Services
KIAMBU COUNTY

All Deputy County Commissioners (***For information and record purposes***)
KIAMBU COUNTY

APPENDIX H: MAP OF KIAMBU CONSTITUENCY

Source: http://www.kiambu.go.ke