DIETARY PRACTICES AND NUTRITIONAL STATUS OF CHILDREN 0-24 MONTHS

ATTENDING DAYCARE CENTRES IN NAIVASHA

MILLICENT ONGOCHE

A56/38665/2020

ongochem@students.uonbi.ac.ke

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE

REQUIREMENTS FOR THE AWARD OF THE MASTER OF SCIENCE DEGREE IN

APPLIED HUMAN NUTRITION

DEPARTMENT OF FOOD SCIENCE, NUTRITION, AND TECHNOLOGY

FACULTY OF AGRICULTURE

UNIVERSITY OF NAIROBI

2022

DECLARATION

I declare that this Research Project is my original work and has never been submitted for the award of a degree at any other University.

Signature of candidate_____ Date <u>August 10 2022</u>

<u>ONGOCHE MILLICENT</u>

<u>SUPERVISORS</u>

We confirm that this research proposal has been submitted approval from:

Signature …………………………. Date …August 24, 2022…

<u>Dr. DASEL WAMBUA MULWA KAINDI</u>

Department of Food Science, Nutrition and Technology, University of Nairobi

Signature …… Date ……… August 24, 2022……

<u>Dr. JEFF WAMITI</u>

Department of Food Science, Nutrition and Technology, University of Nairobi

ACKNOWLEDGEMENT

DEDICATION

To my Inspiration, my dear dad, for always believing in me, trusting and supporting me even though you live 350miles away. I did this to make you proud, to make you happy and to celebrate all your efforts towards me since birth. You've always challenged me to be courageous, kind and focused.

To my family, with Love.

UNIVERSITY OF NAIROBI

Plagiarism Declaration Form for Students

Name of Student: MILLICENT ONGOCHE

Registration Number A56/38665/2020

College: College of Agriculture and Veterinary Sciences

Faculty/School/Institute: Agriculture

Department: Food Science, Nutrition and Technology

Course Name: MSc. Applied Human Nutrition

Title of the work: Dietary practices and nutritional status of children 0-24months attending daycare Centers in Naivasha.

DECLARATION

1. I understand what Plagiarism is, and I am aware of the University's policy in this regard.

2. I declare that this research proposal is my original work and has not been submitted elsewhere for examination, award of a degree, or publication. Where other people's work or my work has been used, this has adequately been acknowledged and referenced under the University of Nairobi's requirements.

3. I have not sought or used the services of any professional agencies to produce this work.

4. I have not allowed and shall not allow anyone to copy my work to pass it off as their work.

5. I understand that any false claim regarding this work shall result in disciplinary action according to University Plagiarism Policy.

Signature _____ _____Date: _____02/09/2022_____

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA- Analysis of Variance

KDHS- Kenya Demographic and Health Survey

MAM- Moderate Acute Malnutrition

MDG- Millennium Development Goal

MS- Microsoft

MAD- Minimum Acceptable Diet

MDD-Minimum Dietary Diversity

MMF- Minimum Meal Frequency

NCK-Nurturing Care Framework

SAM- Severe acute Malnutrition

SPSS- Statistical Package for Social sciences

UN- United Nations

UNICEF- United Nation International Children Emergency Fund

WHO- World Health Organization

OPERATIONAL DEFINITION OF TERMS

Anthropometry   The study of measurements and human being proportions

Caregiver   Informal paid individuals in the daycare facility tasked to take care of children as their parents hold up to their jobs during the day and sometimes at night

Complementary feeding   Process where solid foods are introduced to the infants besides breast milk after six months of exclusive breastfeeding

Guardian   Includes both fathers and other people who brought the children at the daycare center.

Daycare facility   Institutions that provide supervision and care for infants and young children so that their parents can hold jobs and other activities.

Nutrition Status   The health state of a person in terms of nutrients in their diet.

Slum   A residential area that is poorly developed, characterized with overcrowding.

ABSTRACT

Parents of most young children in Naivasha, leave their children in day care centres while their working on flower farms to earn a living. Poverty and various economic factors limit the quality of nutrition and the amount of food given to these children in the day care centres, resulting in stunted growth and developmental complications. The main objective of the study was to identify the dietary practices and the children's nutrition status between the age 0-24months attending daycare centers in the Naivasha. This will contribute to the efforts put in place to combat child malnutrition in Kenya. The hypothesis tested the association between the, dietary practices and the nutrition status of the children raised in daycare centers in Naivasha.

The study design used was the analytical cross-sectional design. The study participants were one caregiver from each of the five daycare centers, 131 mothers/guardians and 131children 0-24months. The daycare caregivers, the mother/guardian, and their children were randomly selected to participate, while the daycare centers and the study setting were chosen purposefully. The data was collected using the Semi-structured questionnaires through interviewer lead interviews and the ODK. The data analysis software used were statistical R, SPSS, and ENA.

The results determined that the dietary diversity score was not met, and 68% of the children met the minimum meal frequency. The Dietary Diversity Score of ten food groups yielded a mean score of 5.0 ± 1.2 (Children 6-23 months). 48% of the children met the minimum acceptable diet. The study revealed that 33% of the children had an intake of iron/iron fortified food 24hrs before the survey. The knowledge score indicated that 67.9% of the mothers/guardians were not knowledgeable. The prevalence of global, moderate, and severe malnutrition was 8%, 7.1%, and 0.9%, respectively. The nutrition status values indicated a significant difference between knowledge and nutrition status ($p<0.05$). The dietary diversity score obtained from the dietary practices indicated no significance association with the nutrition status indicators.

In conclusion, dietary practices among day care caregivers/mothers with children attending the day care centres in Naivasha, affects the nutrition status of the children. The study recommended a further need to improve the dietary intake in Naivasha to reduce the rate of stunting and underweight children among children 0-24months raised in day care centres.

13

CHAPTER ONE: INTRODUCTION

1.1 Background

Daycare centers provide care and child supervision of young children and infants during the daytime to let their parents hold on to their jobs. Daycare centers, formerly known as nurseries, often specialize in providing care for preschool children. Continued women empowerment sets mothers to the employment opportunity, constantly exposing them to significant challenges in ensuring their children are well cared for while they are away for work (Clark et al., 2019). Mothers in a low-income setting resort to using cheap and informal childcare facilities. In normal circumstances, daycare facilities operate poorly ventilated and poorly lit rooms informally created within the care provider's home (Mabele et al, 2018). This is mainly because daycare centres are established solely in order for the providers to make money. The facilities are presented by extreme overcrowding offering the children little simulation. Without caring about the daycare centre conditions, more children are taken in to increase the revenues received by the daycare caregivers. Up to 20-30 young children can be placed in an overcrowded room and given care by untrained caregivers; hence, they will not adhere to any standards (Clark et al., 2019). These circumstances expose young children to a high risk of malnutrition, delayed and impaired development, infections, and child abuse. Globally, approximately a 250million children risk contracting poor developmental potential caused by adversities caused between 0-2 years of life; nutrition according to the WHO/UNICEF Nurturing Care Framework (NCK), among other factors, adequate Nutrition is one of the essential requirements. In Naivasha, a recent study by Western Ontario University (2016) showed that 80% of the children in the Naivasha area were raised in daycare centers because their parents needed to work on the flower farms for a low wage. Therefore, daycare center in Naivasha are critical to the health and nutrition status of children who are raised in that area.

1.2 Statement of the problem

Mothers in their prime working and reproductive years, particularly among low-income residents in Naivasha Municipality, are returning to work as soon as possible after childbirth due to economic hardship. Because of the low wages and inability to afford in-house housekeepers, mothers are forced to leave their children in daycare facilities run by untrained staff. This action has raised concerns about the food intake and dietary effects on the children's nutritional status

immediately and later in life, regarding that 90% of the daycare centers are unregistered and illegal (Henley et al., 2014). Despite the increased efforts to build technical capacity and creation of a Nutrition-related enabling environment for children, there has been a consistent increase in the child malnutrition burden in Nakuru county, getting to 28% rate stunting and 10% undernutrition having higher numbers from Naivasha. (Nutrition International, 2017). Naivasha Sub-county hospital database has shown an annual doubling of malnutrition burden from 2017(Nutrition International, 2017). Little research has been conducted on the dietary factors impacting the nutrition status of children associated with daycare centers in Naivasha. Reduced child mortality is a more difficult Millennium Development Goal 4 due to a lack of adequate information.

1.3 Justification of the study

Every year, approximately 3 million children die from Nutrition globally. Half of the global child death occurs in Africa (UNICEF, 2018). About 70 000 Kenyan children are at risk of dying annually from severe malnutrition and related conditions. A study conducted by Sassi in 2019 finds an increased rate of malnutrition rate among young children in Naivasha by 20% from 2010 (Sassi, 2019). Children in the Naivasha flower farms area were at greater risk of malnutrition and disease infections stated in already done research (Kinuthia, 2017). This study will contribute to the available information on the dietary causes of malnutrition presented to children raised in the daycare systems. As a critical step in achieving the MDG 4, Vision 2030, this study will help the researcher establish a link between nutritional factors and the health of children in Naivasha. The findings herein will contribute to reducing child hospitalization and the health care burden imposed by increased child malnutrition. This will have a positive influence on governmental economic development. Identifying malnutrition causation factors will provide a way of accurately managing it, contributing to the increased life expectancy efforts by the Ministry of Health in Kenya.

1.4 Aim of the study

To contribute towards the efforts put in place to combat child malnutrition in Kenya.

1.5 Purpose of the study

This study's findings will generate data that will be used to inform both the governmental and non-governmental planning efforts to increase daycare caregivers' nutrition knowledge, improvement in dietary practices, and the nutrition status of children raised in daycare facilities.

1.6 Objectives of the study

1.6.1 General objective

To identify the dietary practices and nutrition status of children 0-24months raised in daycare centers in the Naivasha.

1.6.2 Specific objectives

1. To determine the demographic and socio-economic characteristics of the mothers with children attending the daycare centers in Naivasha
2. To assess the dietary practices among children and nutritional knowledge of mothers/guardians and daycare caregivers in the daycare centers.
3. To determine children's nutrition status in daycare facilities in the Naivasha.
4. To determine the relationship between dietary knowledge of daycare facility caregivers and mothers, the dietary practices, and the nutrition status of children raised in Naivasha daycare facilities.

1.7. Hypothesis

1. The socio-economic characteristics of the mothers are positively associated to the nutrition status of the children.
2. Daycare centers caregivers and mothers'/guardians' knowledge positively relates to the nutrition status of the children raised in daycare centers in Naivasha
3. Dietary practices among children positively associates to the nutritional status of children attending daycare centers in Naivasha.
4. There is a strong correlation between mothers/guardians knowledge, dietary practices and nutrition status of children attending daycare centers in Naivasha.

1.8. Limitations of the study

1. Language differences since translations could alter the original meaning of the information

2. Dietary practices was the main factor related to child malnutrition in Naivasha daycare centers.

1.9 Assumptions of the study

The assumption was that the malnutrition-related diseases experienced by the children are due to the dietary factors in the daycare facilities since they spend a more significant part of their day in the facility.

CHAPTER TWO: LITERATURE REVIEW

2.1 Overview

Daycares are known to have originated in Europe in the late eighteenth and early nineteenth century. They were established in the United States by private charities in the 1850s, and the first one became the New York Day Nursery in 1854 (Beatty & Rose, 2000, p. xx). The first daycare was established in France during the early 1840s because of the realization that the world was urbanizing. Pre-schools have for a long time played an important role in upbringing Kenyan children, mostly in Urban centers like Nairobi (Adams, 1983, p. 12). Groups like the local government authorities, church or welfare agencies, and organizations like the Red Cross helped sponsor child care programs and still sponsor them to date. The last half of the twentieth century recorded a remarkable rise in the numbers of women with young children who worked outside of the home. In 2000, 55% of mothers with infants were in the labor force while else in 2001, 64 percent of mothers with children under the age of six, and 78 percent of mothers with children ages six to seventeen were in the labor force. Such figures caused mothers to opt for daycare services to ensure their children were safe while they were at work. In Kenya, daycare facilities started becoming typical a few years post-colonial period due to increased women empowerment efforts. To date, most cities in Kenya have daycare centres, with Naivasha and Nairobi having the highest number due to the increased levels of women's employment, especially in the slums.

With the increased level of women's enlightenment and literacy, many working mothers prefer to rely on daycare centers to care for their children when they attend work. While some mothers prefer inviting nannies to their houses for babysitting, many consider daycare centers a safe option for the many benefits brought by daycare centers, from educational and social opportunities to the flexibility and low costs incurred. The type and amount of nutritional care provided in the daycare centers in highly determined by the nutritional knowledge of the caregivers. Child care providers can encourage healthy eating habits in young children by providing a variety of nutritious foods, limiting junk food and sugary drinks, and encouraging parents to do the same at home. Daycare Centers have become handy in providing child care for children right from birth. Child care is mainly performed by a parent or using casual planning with families, neighbors, or friends. Some people may hire an in-home caregiver such as a nanny

to care for their children at work. Therefore, many daycare centers have varying objectives depending on the institution's goal, for educational purposes or even nutritional care.

Despite the increased efforts to fight wasting, stunting, and obesity in Kenya among children below five years, most daycare caregivers are reported not to have adequate training on good health and optimum nutrition care (KDHS, 2019). This has led to increased morbidity and young age mortality rates. In Kenya, daycare centers have become a profitable business venture for most people, including those who aren't passionate about working with children (Risica et al., 2019). The research question for this systematic literature review was; how does the diet of children 0-24months raised in daycare institutions in Naivasha affect their nutrition status?

2.2 The conceptual framework

The conceptual framework for malnutrition assesses, analyzes, and synthesizes malnutrition actions to improve the nutrition status of children and develop appropriate and practical tools to design programs and mobilize the general community. UNICEF developed the framework. The framework prioritizes the economic approach to malnutrition, focusing on the food commodity. Inadequate dietary intake and diseases are the immediate causes of malnutrition which develop in an infection malnutrition cycle (make each other worse). Children raised in Daycare facilities experience inadequate dietary intake that involves food intake lacking essential nutrients required for the rapid growth stage. Nutrition and food intake inadequacies cause diseases.

The immediate causes of malnutrition lead to short-term consequences, including physical and mental disabilities, death due to disease attacks, and increased morbidity rates from low immunity. Disease attacks and inadequate dietary intake contribute to the long-term malnutrition-related consequences, including poor productivity and constant poverty, chronic diseases including metabolic and cardiovascular disorders, and permanent cognitive and physical disability. These long-term consequences are genetic and often lead to intergenerational impacts.

The underlying causes of malnutrition in the conceptual framework include poor feeding practices in the daycare facilities, inappropriate exclusive breastfeeding, and complementary feeding and food adequacy practices. The households experience food insecurities due to increased poverty levels and the inability to adequately access health care services due to economic constraints and unavailability of enough health care centers largely contribute to the

6

immediate causes of child malnutrition. These underlying causes of malnutrition directly contribute to the short-term and long-term consequences of malnutrition.

The fundamental causes of malnutrition entail community and governmental factors that the individuals or homestead have no control over. These causes include political, environmental, technological, education, natural, and sociocultural influences.
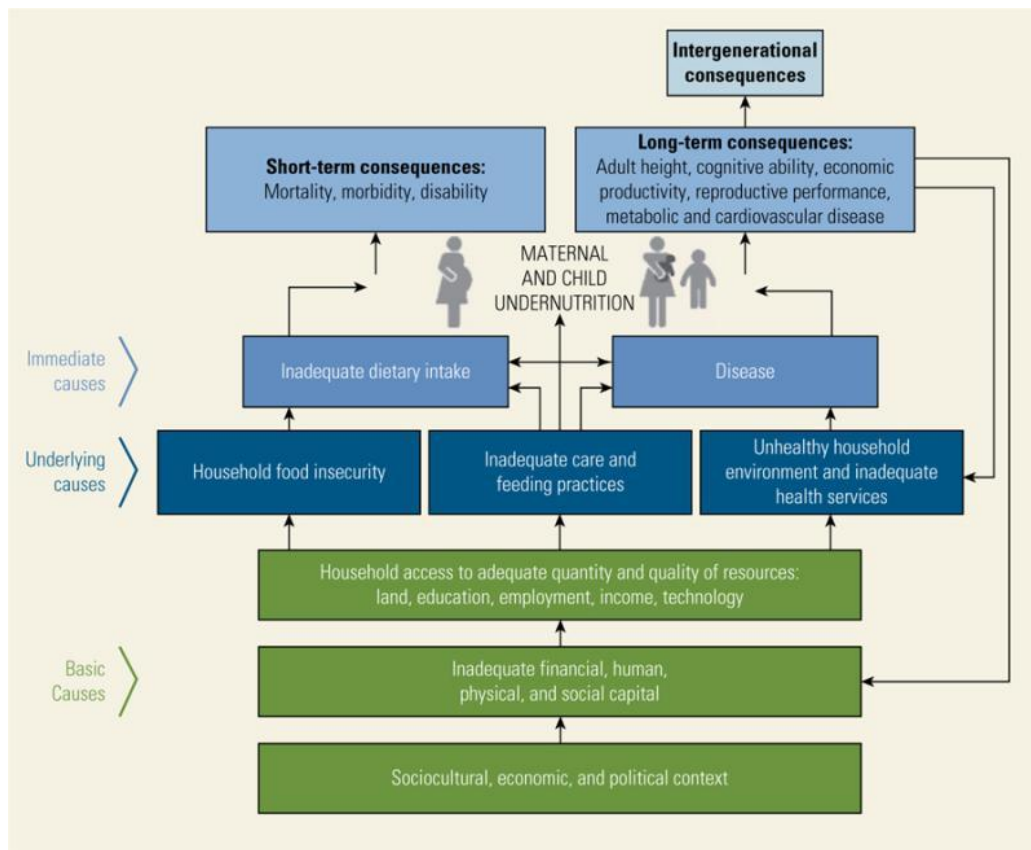
Figure 1: The conceptual framework of malnutrition

2.3 Effects of inefficient IYCF

Khan et al. (2017) explains that when children are not exclusively breastfed, there is an increased odds of fever, ARI, and diarrhea. In the research to identify the nutritional effects of inefficient EBF among children, Khan et al. concluded that 8.94% of ARI conditions, 27.37% of diarrheal, and 13.24% of fever cases could be prevented by children were breastfed exclusively. If EBF were terminated at 0-2months, the odds of the children becoming underweight would be

2.16times higher and 2.01 times higher if EBF was ended at 2-4months. Most mothers who leave their babies in the daycare centers early, before six months, experience a problem breastfeeding them exclusively since both the mothers and the caregivers do not have milk expression knowledge. Working mothers develop a variety of approaches, according to Gross (2016), known as the 'gendered economic strategies' to meet their aim of earning a living and taking care of children. Formerly, children accompanied their mothers to work, or the mothers had an option to get child care help from family members while at work; however, recently, mothers living in informal urban settlements prefer Centre-based child care (Clark et al., 2017). Unlike the wealthier urban women counterparts, these mothers can hardly afford to hire domestic assistants hence having to go for the affordable option of daycare systems considering that they are separated from their kinship network, unlike mothers living in the rural areas (Shelley et al., 2021).

In a study, Dhami et al. (2019) found that mothers with high education levels, those from wealthier families, and those who fully attended the ANC clinics are more likely to practice appropriate complementary feeding than caregivers with no schooling. Most children in the daycare facilities do not follow the monthly clinics due to their high number compared to the available caregivers, failing to get the required care and supplementation, including Vitamin A and deworming services. Young children need Vitamin A to promote immunity and protect children from diseases including measles, chickenpox, diarrhea, respiratory disease, and other severe infections. Food fortified with iron, and iron-based foods should be included in the diet to prevent iron deficiency anemia. Iodine and Zinc foods should be included in the diet to influence sufficient growth and development to reduce stunting and under Nutrition determined in the first 2years of life (Dhami et al, 2019)

2.4 Dietary-related malnutrition in children.

Improper or inadequate dietary intake is the main factor in children's malnutrition. Undernutrition and stunting in later life are commonly built in the first two years of life. A study shows that 75% of children with an adequate diet in their first two years are less likely to be malnourished than their counterparts who do not get enough dietary intake (Lin et al., 2013). Inadequate nutritional intake at an early age leads to malnutrition – a vicious disease cycle since malnutrition leads to disease infestation that affects food intake, digestion, and utilization, leading to malnutrition. Malnutrition leads to low immunity, poor child growth and development,

high demand for health services, low IQ- poor performance (language, social), Absenteeism and repetition, waste of resources in treatment, and an unhealthy workforce.

2.5 Daycare center situation in Kenya

Mothers in Kenya living in resource-limited areas in towns lack kin support for their children while relying on low-paying jobs in the informal sector. Strategies including schooling expansion, credit access, and entrepreneurial skills are set up to improve women's income generation efforts. Unfortunately, these strategies do not consider the daycare center provision requirements among mothers with young children engaged in casual jobs. The international labor organization reports that the promotion of inclusive and productive employment for all takes on critical importance in Kenya, considering that labor force participation among women is 62%, compared to 72% in men.

Child care nutrition also has policies that enable the proper growth and development of children. Caregivers influence children's dietary behaviors through role modeling in child-care environments and this eventually determines a child's health. Daycare centers come up with nutritional policies that indicate a dietary plan of how every meal will be taken to ensure they meet the children's nutritional requirements while under their care. Environmental factors in child-care surroundings that contribute to children's dietary intakes and behaviors include nutrition policies and practices and foods and beverages offered (Erinosho et al., 2012, p. 119). Therefore, written guidelines in daycares help caregivers have a consistent and required nutritional diet for children. Notably, daycares with a higher staff-to-child ratio can dedicate more individual time to each child and are more likely to ensure the environment remains safe and clean for the children.

2.6 Daycare policies globally and in Kenya

A child's right is to get quality care and protection against any dangers, especially from caregivers. Among the most affected, girls, children, and children with disability are exposed to the most risk. Among other things, measures to support wider dissemination and implementation of the Sexual Offenses Act 2006 and the Disability Act (2003), IEC programs to raise awareness on the rights of the children and forms of child abuse by caregivers, and the provision of a free and accessible channel to air complaints of child abuse, especially for a right claimed by the child, can be taken to enhance caregiver protection against harm.

Daycare policies and regulations revolve around a child's safety and well-being. Policies and procedures help daycare centers maintain an unswervingly professional organization and can provide an exceptional quality by clarifying to staff and parents the scenery the center is in and what actions are taken to ensure this happens. In Kenya, it is the requirement of any daycare center to be registered and licensed within a specified county. Daycare centers are also required to ensure that adults providing day care, looking after children, or having unsupervised access to them are suitable to provide care to children. The centers are expected to have one caregiver for every three children below age two. Daycares are also required to meet children's individual needs and promote their welfare by planning and providing activities and play opportunities to develop children's emotional, physical, social, and intellectual capabilities.

The National Association for the Education of Young Children (NAEYC) issues recommendations connecting to the organization and structure of daycare centers, mainly those that offer care for infants and toddlers (Encyclopedia of Children's Health, 2022). These recommendations are considered to be the minimum standards a daycare center should observe. Some major policies for daycare recommended by the NAEYC are that there must be no more than four infants per caregiver and not more than eight infants per group of children in center-based care and that there should be not more than four young toddlers (12–24 months) per caregiver, with a maximum of 12 young toddlers and three caregivers per group. The body also recommends that the staff in a given daycare center should be trained periodically and overseen.

Globally, States and all organizations with child care programs must have childcare policies that are in line with national legislation and international law as stated in the constitution or bodies like the Convention on the Rights of the Child (Better Care Network, 2022). Child protection regulation which identifies that abuse can be bodily, emotional, sexual, or neglect and may be carried out by parents, caretakers, children, and other adults is also required. It is expected that daycare centers must have written child protection policies that respect children's rights. The policies should outline behaviors and actions that are offensive to children and provide standards for the appropriate care. There should also be guidelines on the procedures to follow and by whom, including reporting mechanisms for suspected abuse to an assigned authority for investigation.

2.7 Gaps in knowledge

Mothers in their prime working and reproductive years, particularly among low-income residents in Naivasha Municipality, are returning to work as soon as possible after childbirth due to economic hardship. Because of their low wages and inability to employ domestic help, women are forced to send their children to low-cost daycare facilities where they are cared for by untrained staff in order to meet their professional and childcare obligations. This action has raised concerns about the food intake and dietary effects on the children's nutritional status immediately and later in life, regarding that 90% of the daycare centers are unregistered and illegal (Henley et al., 2014). Despite the increased efforts to build technical capacity and creation of a Nutrition-related enabling environment for children, there has been a consistent increase in the child malnutrition burden in Nakuru county, getting to 28% rate stunting and 10% under Nutrition having higher numbers than Naivasha sub-county(Nutrition International, 2017). Naivasha Sub-county hospital database has shown an annual doubling of malnutrition burden from 2017. Little research has been conducted on the dietary factors impacting the nutrition status of children associated with daycare centers in Naivasha, which comprises the increased knowledge gap in this area. The inadequacy of information has led to increased hindrances towards achieving the Millennium Development Goal 4 of reducing the child mortality rate. This study seeks to address the gap in the dietary risk factors in the daycare facilities that may predispose children below two years in Naivasha Municipality to malnutrition.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 Study design

The study utilized a cross-sectional study design using quantitative research methods. This design was used since different variables were compared at the same time. This study utilized an analytical cross-sectional study design to determine if the exposure to the dietary risk factors correlates with the nutritional status outcome. The researcher collected cross-sectional data on the past dietary practices and the current diagnosis of the nutrition status. The exposure and the result were looked at, at the same time, selected using predesigned inclusion criteria. The data was collected in october 2021 from 22nd to 24th.
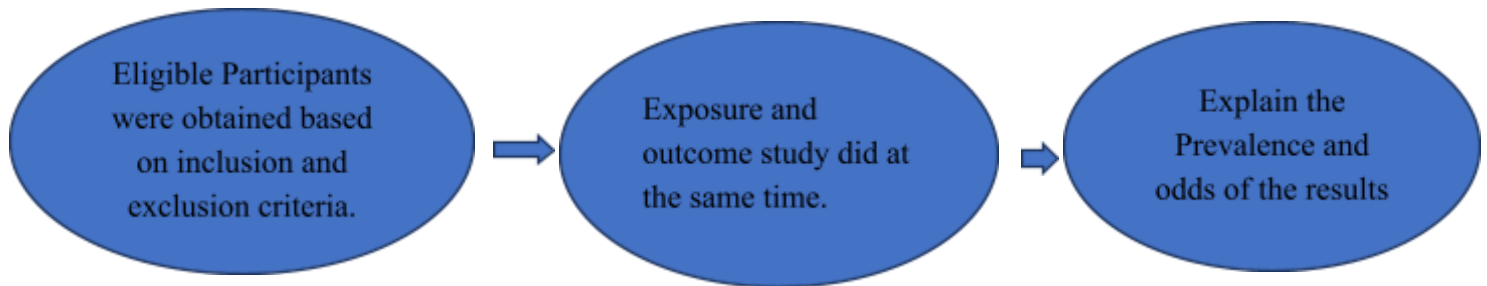
Figure 2: Cross-Sectional Study Design Representation

3.1.1 Study setting

The study was done in Naivasha, covering communities residing in DCK, Kamere, Karagita, Kihoto, and Naivasha town. The study area lies northwest of Nairobi at a latitude 0008' to 0046'S longitude 36014' to 36043'E. It is located on the shore of Lake Naivasha and along the Nairobi - Nakuru highway and Uganda Railway (Figure 1). Naivasha is part of Nakuru County, with an urban population of 190,082 males and 186,161 females, resulting in 376,243 people (KNBS, 2019). The primary industry in Naivasha is agriculture, especially floriculture. Naivasha sub-County has 365.6Km2 under flower production with 2,500 seasonal employees. Naivasha is an essential resource to many stakeholders and has recently experienced a massive influx of populations in the primary industry despite the typically low wages indicated by the low economic status of the casual workers.
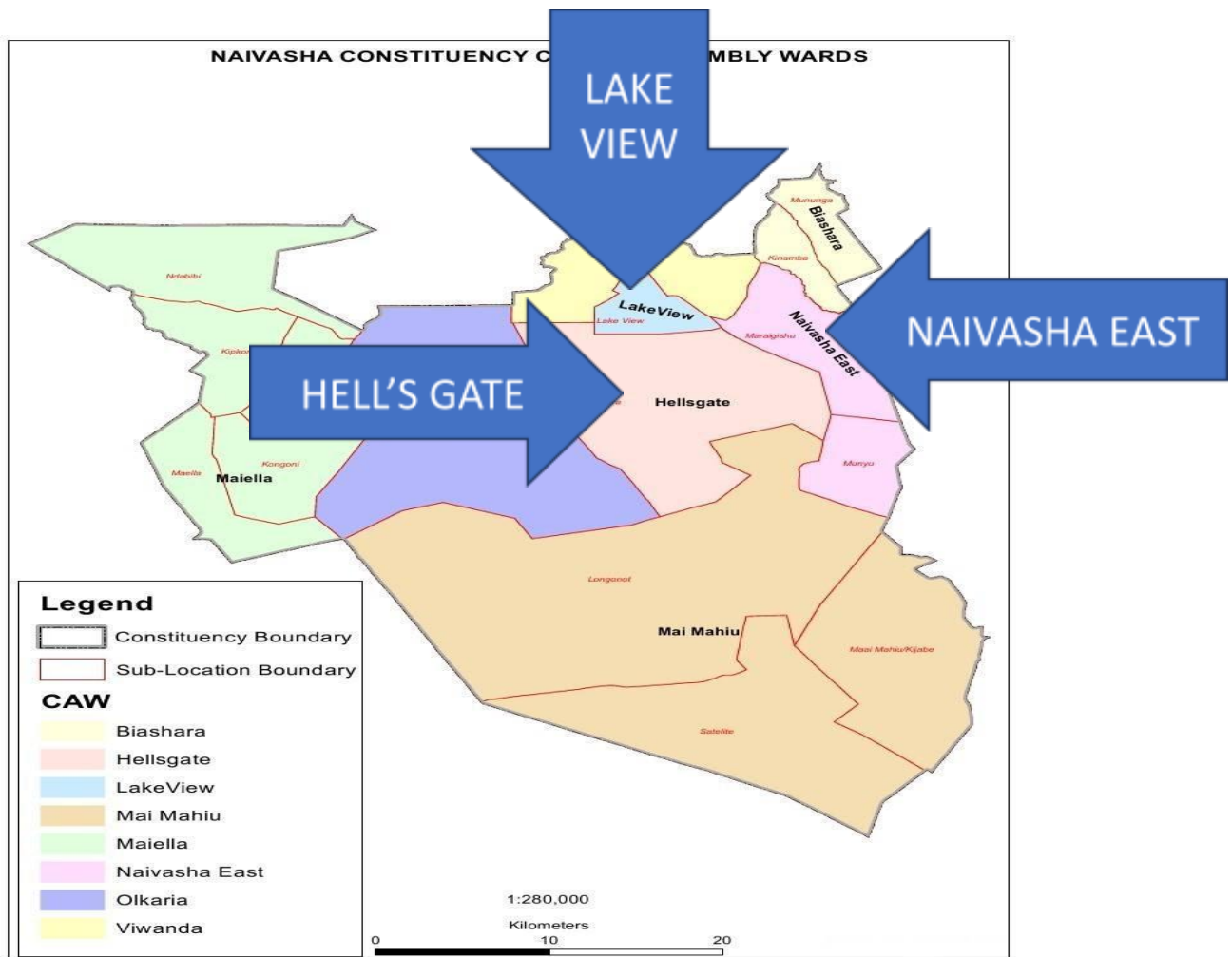
Figure 3: **Naivasha-sub county map(study setting)**

3.2 Study methodology

3.2.1 Study population

The study participants were caregivers in the selected daycare centers handling children 0-24months in the Naivasha Municipality district comprised the primary respondents to facilitate comprehensive data collection, the children and their mothers. The daycare facilities included Mama Watoto, Mama Wairimu, Blessed Hands, Longonot and Nini CBO daycare centers.

3.2.1.1 The inclusion and exclusion criteria

INCLUSION CRITERIA

1. Caregivers handling children below two years in the daycare centers for not less than six months.

2. Children 0-24months attending the daycare center daily for not less than 2months ago

3. Mothers or guardians with children less than 24 months attending the daycare centers

EXCLUSION CRITERIA

1. Caregivers and mothers who will not sign the consent to participate

2. Caregivers with any cognitive impairments.

3.2.2 Sampling

3.2.2.1 Sample Size Determination

To ensure that the test has a specified power, the research study comprised a sample of 131 participants obtained through the following formula;

Use Fischer's formula below:

$$n = \frac{Z^2 \times p \times q}{d^2}$$

Where: n - the sample size

Z - The level of significance with a confidence interval of 95%, giving a z-value of 1.96

p - The Prevalence of the event

q - Given by 1- p

d - The degree of accuracy

Using the Prevalence of child malnutrition in the study area to be 9.2% (Transform Nutrition, 2017)

$$n = \frac{1.96 \times 1.96 \times 0.092 \times 0.908}{0.05 \times 0.05} = 124.5$$

With an attrition rate of 5%, the number of participants was:

124.5/0.95 = 131

= 131 children and their mothers

The participants included the children's mothers/guardians and five daycare facility caregivers.

3.2.2.2 Sampling Procedure

The study setting was selected purposively, since a lot of daycare facilities are located in Naivasha due to the floriculture activities. The community from which the daycare centers are located was selected purposefully. This community was where the floriculture practices were rampant. The five daycare centers used in data collection were randomly selected. The sampling frame consisted of 131 children and their mothers, 26 from each of the five daycare centers. At least one caregiver from each of the daycare facilities were interviewed. The randomly selected children to participate in the study had to be in the daycare facilities for at least three months.

Mother/guardian and children sampling- First level

NAKURU (county) ———————————— Purposive Sampling

⬇

NAIVASHA ———————————— Purposive Sampling

(Naivasha East, Hell's gate, and Lake view)

⬇

5 DAYCARE FACILITIES ——————Systematic Random Sampling

⬇

131 (children and mothers)———— Simple Random Sampling
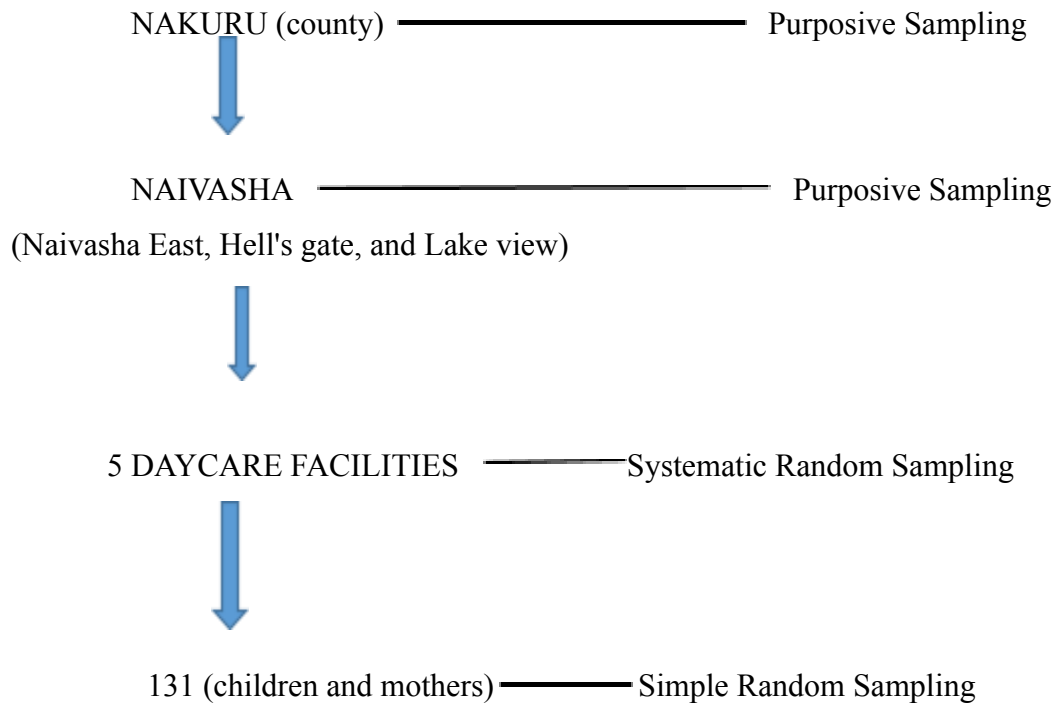
Daycare facility caregiver sampling- Second level

Five daycare facility caregivers ———— Simple Random Sampling

⬇

One daycare Caregivers in each daycare facility —Simple Random Sampling
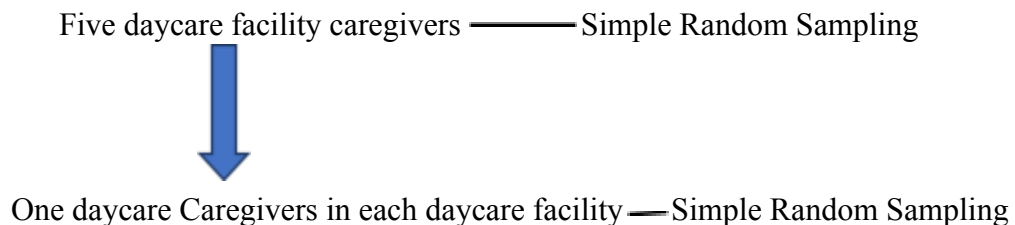
Figure 4: **Sampling Schema of the data(first and second level)**

3.3. Definitive data collection

3.3.1 Study methods/ techniques for each specific objective

3.3.1.1 Socio-demographic and economic characteristics of the mothers and caregivers who take their children to the daycare centers in the Naivasha.

For the first specific objective, the semi-structured questionnaire aided in obtaining information on the education level, age, marital status, and sex of both the daycare facility

caregivers and the mothers. The occupation and income level of the mothers were also obtained. Face-to-face interviews using online questionnaires was done.

3.3.1.2 Dietary practices of children and nutritional knowledge of mothers with children attending the daycare centers

A semi-structured questionnaire was used to gather data on the knowledge of maternal daycare centers caregivers. The questions were taken from FAO standards to measure the knowledge, attitudes, and practices in nutrition. (KAP) (Macias & Glasauer, 2014). Seven questions were asked on complementary feeding and breastfeeding. The responses were recorded and used to determine the knowledge level using the knowledge scale.

For IYCF Children aged 0-24 months who ingested iron-rich or iron-fortified foods were assessed using variables such as the minimum dietary diversity (.MDD), minimum acceptable diet (MAD), and minimum meal frequency (MMF). The FAO guidelines were used to develop the tools to assess these guidelines and conduct KAP surveys on Nutrition (Macias & Glasauer, 2014). The questionnaires contained questions that reflect a dietary diversity checklist and the 24 hr. recall questionnaire.

The MMF was evaluated according to the number of meals fed to the child in the last 24hrs. For the breastfed children, getting at least two meals (6-8 months) or at least three meals (9-23 months) were used to determine the achievement of the MMF. Non-breastfed children need to be fed at least four times the previous day to meet the MMF without regard to their age. World Health Organization (WHO) and others (2010). The suggested MDD was calculated in accordance with the WHO et al. (2010) recommendations. The kid's individual dietary variety score was calculated using a seven-category score, which showed the number of food categories supplied to the child over the previous 24 hours. Nuts and legumes, roots and tubers, grains, meat foods, dairy products, vegetables and fruits high in vitamin A, eggs, and other fruits and vegetables were all included in the food groups. World Health Organization (WHO) and others (2010). For non-breastfed children, the MDD requirement was to consume at least four food groups without including milk feeds, whereas breastfed. To meet the MAD, children had to have achieved at the same time the MMF and MDD 24 hours before the data collection. Consuming at least two milk feeds was an added condition for non-breastfed children to achieve the MAD (WHO et al., 2010). A short food intake checklist was used to consume iron-rich or fortified foods among the children. The child should have consumed one or more of the following food

types in the previous 24hrs: commercially iron-fortified foods specially designed for infants and young children, flesh foods, and iron-containing Micronutrient Powder (MNP) foods (Macias & Glasauer, 2014).

3.3.1.3 Nutrition status of children attending daycare facilities in the Naivasha.

According to the WHO guidelines, anthropometric data was taken twice, weight and height (WHO, 2008b). Underweight, Wasting, and Stunting were the three nutrition indicators for assessing children's nutrition status. The SECA scales and the length boards were the tools used.

3.3.2 Data collection tools

3.3.2.1 Questionnaire

Both online (ODK) and hardcopy questionnaires were used in data collection. The pretested questionnaire was divided into social demographic and socio-economic sections, maternal nutrition knowledge, IYCF practices, and anthropometric measurements. The questionnaire included the parts for both quantitative data and qualitative data.

3.3.2.2 Dietary diversity assessment

The ten-food group checklist was used to determine the dietary diversity score for the children (FAO, 2014). The foods fed to the child were classified into food groups to gauge whether the child had at least eaten foods within five food groups, the cut-off point to meet the MDD (6-24months children

3.3.2.3 Anthropometric measurements

Referring to WHO (2014), recommended guidelines for measuring weight and height (length) of under two years of children were taken.

Height — the length board was used to measure the length of the children, and the readings were obtained to the nearest 0.1cm. The mothers and caregivers helped remove the children's excess clothing before the measurements. The board was placed horizontally on a flat surface, and the child lay on its back with the feet in a straight position. The child's knees, heels, and buttocks were touching the board, with relaxed shoulders, straightened arms, and shoulder blades touching the board. The exact length was obtained from the average of 2 measurements for accuracy.

Weight- the electronic SECA scale was placed on a flat surface, and a known weight object was placed on the scale before every weighing session. Children were weighed only with lightweight clothes. The average of 2 measurements was taken and rounded to the nearest 0.1kg.

3.3.3 Recruitment and training of enumerators

3.3.3.1 Recruitment

A poster was made with the required qualification for the enumeration position. The requirements included: The age between 19-25years, possess Nutrition and data collection skills and experience, fluency in communication, a person who upholds decency and good self-presentation and Computer literate person.

3.3.3.2 Training

The research used three enumerators trained before the data collection, recording, and analysis. The one-day training was conducted following a curriculum with guidance on what the training entailed. The trainees were briefed on the research objectives, aim, purpose questionnaire, interviewing, and data collection techniques. The enumerators took part in pretesting the data collection tools and familiarizing themselves with the project's requirements before the actual data collection.

3.4 Pretesting study tools

The tools were pretested by the enumerators, two days before the data collection process commencement date to ensure that tools were correctly calibrated to reduce fault and bias. The dietary and anthropometric assessment tools were tested to avoid errors and increase data accuracy. The online questionnaire (ODK) was tested and installed on the enumerators' devices a day before the actual data collection.

3.5 Ethical considerations

Since the research utilized human subjects, ethical clearance at the local community government levels was obtained as well as from the individual daycare facility administration. The participants also signed an informed consent form to accept participation before the data

collection process voluntarily. Ethical clearance was obtained from an ethics review body: KNH-UON ERC.

3.6 Data quality control

Table 3.1: Aspect and attributes of data quality (Jaya et al, 2017).

ASPECT	ATTRIBUTE TO DATA QUALITY
Accuracy	Pretested the data collection tools
	Set achievable and SMART objectives
Completeness	Ensured all information was appropriately stored in the computer, with no missing elements.
Consistency	Information was similar and did not conflict with itself
Timeliness	Followed the GANTT chart to ensure information was available when needed.
Validity	Adopted correct data management and analysis tools and followed a valid format.
Uniqueness	Ensured none of the information was duplicated.

3.7 Data analysis

Data were cleaned before commencing the analysis process. The R software, SPSS, Microsoft Excel, and ENA were used for data analysis. Charts and graphs were developed for proper finding presentation.

Socio-demographic and economic characteristics of the caregivers who take their children to the daycare centers in the Naivasha.

Percentages, frequency and mean was used in the analysis of Age, Gender, marital status, household size, level of education and ownership of assets. A pie chart representation was used for the age and a frequency distribution table was used to represent the ownership of assets.

Dietary practices and nutritional knowledge of mothers and caregivers of the daycare centers.

Percentages were used to analyze the different types of food consumed by the children in the last 24hours. The food consumed and food types were represented on a frequency distribution table. A bar graph was used to represent the minimum meal frequency. A t-test analysis was carried out to determine the association between the minimum dietary diversity and the nutrition status of the children. The minimum acceptable diet and the consumption of iron was computed using percentages. A frequency distribution table was used to represent the water, hygiene and sanitation practices data. A knowledge scale was used to determine the level of nutrition knowledge among the mothers/guardians.

Nutrition status of children being raised in daycare facilities in the Naivasha.

The anthropometrics and the prevalence of acute malnutrition based on weight-for-height z-scores were computed using the ENA software. The association between mothers' knowledge and nutrition status was obtained using chi-square test.

Dietary knowledge of guardians/mothers, the nutritional practices, and the nutrition status of children raised in Naivasha daycare facilities.

Linear regression and t-tests were used to determine the association between nutritional status and dietary knowledge of mothers, the association between nutritional status and dietary practices in the daycare centers and the association and the association between nutrition status and the food diversity score

CHAPTER FOUR: RESULTS

4.1 Socio-demographic characteristics of the daycare centers caregivers and the mothers

4.1.1 Gender of respondents

A total of 131 mothers/guardians from the five daycare centers (Mama Watoto, Blessed hands, mama Wairimu, Longnot and Nini C.B.O daycare centers) were involved in the study with a mean age of 31.2±5.9 with a minimum of 17 and a maximum of 65 years old, respectively. The gender distribution of all the participants was 91.6% females and 8.4% males. The children gender frequency was 67 females and 64 males. Table 4.1 further illustrates the demographic characteristics of the participants.

4.1.2 Age distribution of respondents
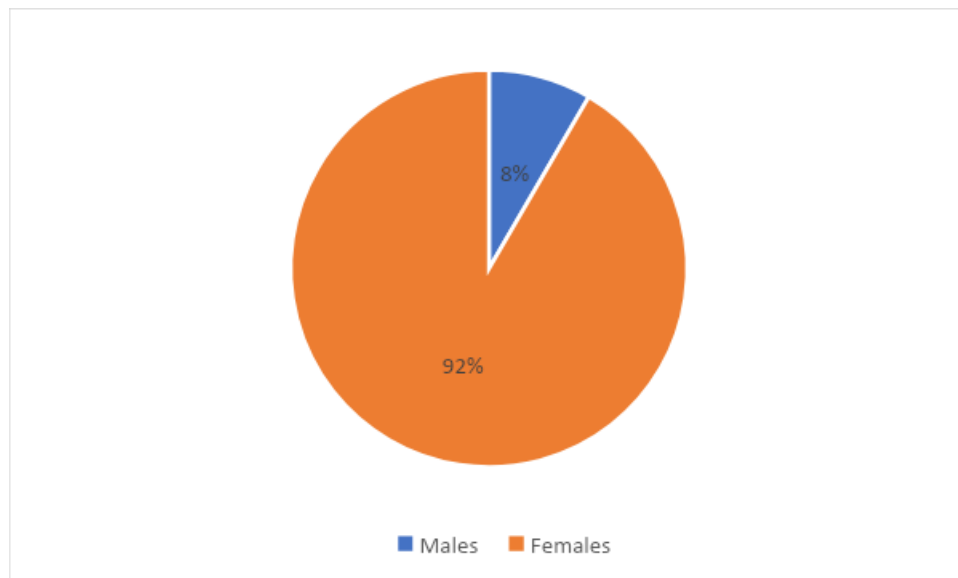
Figure 5: Gender distribution of the mothers/guardians

4.1.3 Marital status of respondents

More than half of the participants were married (66.4%), while only 31.3% were unmarried.

4.1.4 Household sizes

Most families (67.9%) had a household size of fewer than three members, and 30.5% of the participants had family members of between four and seven. Only 1.5% of the participants had family members of seven members and above.

4.1.5 Sources of income

Half of the participants' primary source of income was from salaried employment (48.9%), while the other half depended on casual labor, farming, and business at 16.8%, 19.1%, and 13%, respectively.

4.1.6 Level of education

About 29% of the mothers had completed secondary education, and 37.9% and 25.2% had completed post-secondary and university education, respectively. The majority of the interviewed daycare facility caregivers (60%) had worked in the daycare centers for less than six months, and 20% had worked for more than six months but less than a year. Only 20% had worked in the daycare centers for more than twelve months.

4.1.7 Ownership of assets

Regarding asset ownership, 38.9% of the participants owned a house and a car, and 28.2% had other operating businesses

Table 4.1: Economic Status of the mothers/guardians

Variables	% (n=131)
Property ownership	
Car	38.9
House	38.9
Business	28.2
Land	3.1
Cart	1.5
Fridge	6.1
Microwave	6.1
Furniture	9.9
Radio	0.8
TV	16.0
Motorbike	6.1
Greenhouse	0.8

4.2 Dietary practices of children and gurdian/mothers' nutritional knowledge

4.2.1 Food groups and food types consumed by children

The foods types consumed by children in the daycare centers include maize ugali, potatoes, beans, spaghetti, fish, beef, oranges, water melon, mangoes, rice, carrots, and groundnuts. The food types were grouped into ten food groups and the percentages of how much the groups were consumed presented in the table below:

Table 4.2: Food groups consumed by children 6-24months, 24hrs before the survey

Food groups	% Consumed
Grains	90.2
Roots and tubers	90
Legumes	70.6
Nuts	65
Dairy products	26
Flesh foods	18
Eggs	8
Fish	20
Vit A fruits and vegetables	63
Other fruits and vegetables	50.7

(n=112)

4.2.2 Minimum Dietary Diversity

The dietary diversity score highlighted the number of food groups each child took 24hrs before the survey was done. Among the 112children 6-24months, the mean dietary diversity score 5.0. According to the dietary diversity score children who ate 1-5food groups did not achieve the score and those who ate between 6-10 food groups 24hrs before the survey, achieved the dietary score. The frequency of children who met the dietary diversity score was 19 while 93 of the children did not meet the dietary diversity score.

Table 4.3: The Dietary diversity score for children 6-24months

Food groups consumed	Frequency	Percentage%	Cumulative frequency
1	8	7.14	7.14
2	28	25	32.14
3	20	17.86	50
4	25	22.32	72.32
5	12	10.71	83.03
6	7	6.25	89.28
7	10	8.93	98.21
8	0	0	98.21
9	2	1.79	100
10	0	0	100
Total	112	100	

(n=112)

4.2.3 Minimum Meal Frequency

The MMF was calculated separately for breastfeeding and non-breastfeeding children aged 6-24months according to the WHO guideline (2010). Among the 112 children who were 6-24months and participated in the study, 102 were still being breastfed, and only ten were not receiving breast milk. Overall, 68% of the children met the MMF. Among the non-breastfed children, 30% achieved the MMF, while 75% of breastfed children achieved the MMF as shown below:
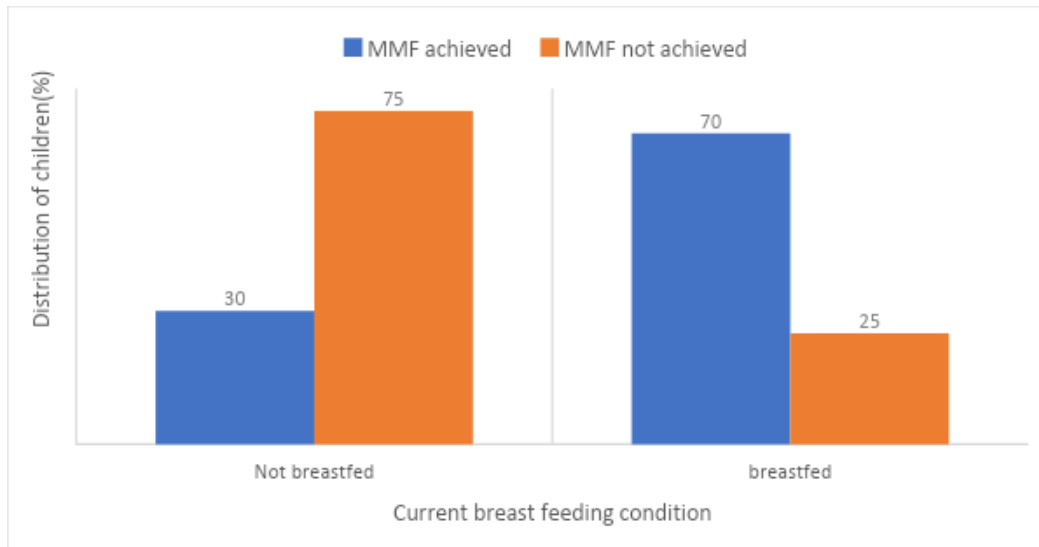
Figure 6: Minimum Meal Frequency representation (achieved and not achieved)

4.2.4 Minimum Acceptable diet of the children

This diet meets the bare minimum requirements for health and safety for 6-23months children who have met both the MDD and the MMF the day before the survey. The study shows that almost half of the children who participated (48%) met the MAD, and only 12% of the non-breastfed children achieved the MAD.

4.2.5 Consumption of iron-rich/iron-fortified foods

One day prior to conducting this survey, only 33% of the 112 children surveyed had consumed iron-rich/iron-fortified foods. 15% of children who ate iron-rich/fortified foods ate meat, seven percent ate fortified foods, and five percent ate food that had been enriched with MNP. 6.5% of those who consumed an iron/fortified diet got it from more than one source

4.2.6 Water, Sanitation Hygiene, and children Morbidity

About 65.6% of the children had not fallen sick in the last seven days. Of the 34.4% that had fallen sick in the last seven, 51.1% and 33.3% had suffered from cold and digestion-related illnesses. 8% had respiratory-related illnesses, and 6.6% had other physical illnesses. Majority of participants treated drinking water (86.3%) by boiling (57.3%), chemicals (10.7%), distillation (16.0%), and filtration (3.8%). 71% of participants used pit latrines, while 29% used flush toilets. 82.4% of the participants disposed of their garbage through garbage collection by garbage collectors and 17.6% disposed of garbage in water bodies.

Table 4.4: Frequency of Children's Morbidity

	Percent(n=131)
Sick last seven days	
Yes	34.4
No	65.6
Type of Illnesses	
Respiratory-related and cold	59.0
Digestion related	33.3
Physical related	6.6

Table 4.3 illustrates that 59% of the children who had been sick in the past seven days (34.4%) had suffered from a cold. Among the children who had been ill, 33.3% had suffered from digestion-related diseases. The data about water and sanitation was from the mother/gurdians on the practices at home.

Table 4.5: Frequency of water, sanitation, and hygiene practices

	Percent
Treat drinking water	
Yes	86.3
No	13.7
Method of water treatment	
Boiling	57.3
Chemicals	10.7
Distribution	16.0
Filtration	3.8
Type Toilet	
Pit latrine	71.0
Flush Toilet	29.0
Disposal of litter	
Flying dustbins	2.3
In water bodies	15.3
Collected by Garbage collectors	82.4

Caregivers/mothers/guardians with children 6-24months who were on complementary feeding answered the question on water treatment, and 57.3% of those children were drinking boiled water. Other water treatment methods, including chemicals, distillation, and filtration, were practiced at 10.7%, 16%, and 3.8%, respectively.

4.2.7 Child feeding practices in the daycare centers

A total of 131 children were involved in the study. Their age ranged from 0-24 months. The proportion of those still breastfeeding was 91, and those exclusively breastfed was 47.6%, respectively. (children <=6 months). The children were getting 2 meals and a snack from the dycare centre. Daycare cargivers reported about the diets at the daycare centres and the mothers/guardians reported on the diets consumed at home in the evening. The dietary diversity score of 10 food groups yielded a mean score of 4.0±1.2 (Children 6-24 months).

4.2.8 The Knowledge scale of the mothers/guardians

Seven questions were asked to assess the nutrition knowledge of mothers/guardians with children attending the selected daycare centres in Naivasha. A knowledge score was developed and the number of questions answered positively by every mother/guardian recorded. The knowledge score was used to determine the percentage of mothers/guardians who were knowledgeable and those that were not. The mean value of the knowledge score was 3.3969. The mothers/guardians who provided upto four correct responses, were considered not knowledgeable while those who got from five and above right answers were nutritionally knowledgeable. Acoording to the knowledge score in Table 4.6, 67.9% of mothers/guardians were not knowledgeable while 32.1% were knowledgeable.

Table 4.6: The knowledge score of the mothers/gurdians

	Frequency	Valid Percent
.00	3	2.3
1.00	28	21.4
2.00	44	33.6
3.00	9	6.9
4.00	5	3.8
5.00	4	3.1
6.00	4	3.1
7.00	34	26.0
Total	131	100.0

n=131

0-4: Not knowledgeable (67.9%)

5-7:Knowledgeable (32.1%)

29

Overall knowledge of the mothers/guardians was analyzed by calculating the percentage of all the positive responses from the questions asked on nutrition knowledge. The table below shows the positive responses scale and the overall nutrition knowledge.

Table 4.7: The overall knowledge Score (Öngün Yılmaz et al, 2021).

Child nutrition Aspects	% positive responses	Score (points)
Initiation of breastfeeding	32.1	2
Meaning of exclusively breastfeeding	39.1	2
Duration of exclusively breastfeeding	43.5	3
Continued breastfeeding for at least two years	41.2	3
When to commence complementary at six months	47.3	3
Meal Frequency	54.2	3
Meaning of Resp. feeding	35.9	2

0-20%=1point, 21-40%=2point, 41-60%=3points, 61-80%=4points,81-100%=5points.

The scale used to determine if the mothers/guardians had high, medium or low nutrition knowledge was as follows: High Knowledge:21-25Points, Medium knowledge:11-20Points, and Low knowledge:0-10Points. The total points obtained were 18 points which showed that the mothers had medium child nutrition knowledge.

4.3 The nutrition status of children being raised in daycare facilities in the Naivasha.

4.3.2: Prevalence of acute malnutrition based on weight-for-height z-scores

The anthropometric measurements were analyzed into z scores which showed the percentage malnutrition among children 6-24month. The prevalence of wasting, underweight and stunting according to z scores are shown in the table below:

Table 4.8: Prevalence of acute malnutrition, wasting and stunting based on weight-for-height z-scores (Children 6-24 Months)

	All n = 112	Boys n = 56	Girls n = 56
Prevalence of Global Acute malnutrition (Wasting)	(9) 8.0 %	(6) 10.7 %	(3) 5.4 %
Prevalence of Underweight	(14) 12.5 %	(8) 14.3 %	(6) 10.7 %
Prevalence of Stunting	(15) 13.8 %	(7) 12.7 %	(8) 14.8 %

The 8% value of the acute malnutrition shows that the malnutrition status is of the children is alarming. Nine children showed z-score values of <-2 for wasting, 14 among all the children were underweight and 15 were stunted.

4.4: The relationship between dietary knowledge of guardians/mothers, the nutritional practices, and the nutrition status of children raised in Naivasha daycare facilities.

4.4.1: Association between nutritional status and dietary knowledge of mothers

A correlation test to assess the association between the nutritional status of children in the daycare centers and the dietary knowledge of mothers was positive. The pearson's correlation

Table 4.9: Association between Nutritional Status and dietary knowledge of mothers (correlation test)

<div align="center">Correlations</div>

		knowledge_score	waz_who	haz_who	whz_who
knowledge_score	Pearson Correlation	1	.038	.156	-.141
	Sig. (2-tailed)		.666	.078	.111
	N	131	131	131	131

The chi square test showed a significant association between guardian/mothers' nutritional knowledge and nutritional status of children (p<0.05).

Table 4.10: Association between Nutritional Status and dietary knowledge of mothers

<div align="center">Chi-Square Tests^c</div>

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.138ᵃ	1	.023	.026	.021

4.4.2: Association between Nutritional Status and dietary practices in the daycare centers.

The dietary diversity score obtained from the food groups consumed by children was used to assess the association between the dietary practices and the different nutrition status indicators. The correlation analyzed the association between the 2 variables as shown in figure 4.11.

Table 4.11: Association between Nutritional Status and dietary practices (dietary diversity score) in the daycare centers (n=112)

	r (correlation)	p-value
Weight for Age (Under Weight	**0.653**	**0.028**
Weight for Height (Stunting)	**0.440**	**0.024**
Weight for Height (Wasting	**0.521**	**0.030**

The correlation showed a significant association between dietary practices in the daycare centers and the nutritional status of children (p<0.05).

CHAPTER 5: DISCUSSION

5.1 Socioeconomic and socio-demographic characteristic profile of households in Naivasha

The mean age of 31 years among mothers is consistent with the findings by Shelley et al. (2021) that young mothers mainly below 35 years of age mainly seek childcare services. Most households in Naivasha consist of less than three members, with a third of the households having more than four members. The household size in Naivasha is consistent with the findings from the recent census in 2019 that found that the average household size in Keya compromised of 3.9 members (Kenya National Bureau of Statistics, 2019).

Almost half of the mothers or guardians in this study were casual laborers and farmers. This corresponds to the survey by Shelley et al. (2021), which indicated that women from low socioeconomic backgrounds cannot afford the luxury of a domestic assistant and therefore resort to the option of daycare institutions. Most mothers had completed primary school education as their highest level of education, which corresponds with a study by Cherop (2017). Most women only attain primary education as their highest level of education, although a small proportion of women achieve secondary education (Cherop, 2017). These findings are also consistent with the National Council for Population and Development (NCPD) report on the state of Kenya population report 2020, which indicated that more than half of women had only a primary education at their highest level.

5.2 Dietary practices and nutritional knowledge of mothers and social workers of daycare centers

5.2.1 Dietary practices in the daycare facilities

Children from the daycare centers mainly consumed grains, tubers, legumes, and roots and rarely consumed eggs, dairy products, and beef foods. Additionally, more than half of the children below six months were also exclusively breastfed, which is consistent with the 2019 Global Breastfeeding Scorecard (United Nations Children's Fund (Unicef) &World Health Organization (WHO), 2019). The exclusive breastfeeding rates in Kenya in 2019 were 61% (UNICEF & WHO, 2019).

There was an association between food diversity scores and underweight, stunting, and wasting (p=0.269, 0.276, and 0.807, respectively. This implies that children in the daycare centers who failed to attain the MDD were more likely to suffer from stunting, underweight, and wasting. Concerning sanitation and morbidity, half of the children had suffered from common flu

(51%) and digestion-related illness (33%). These findings are consistent with the findings by Henley et al. (2014) that unhygienic conditions in daycare facilities facilitate infections among children (Henley et al., 2014)

5.2.2 Nutritional-related knowledge

This survey indicated that more than half of mothers/caregivers are not knowledgeable about breastfeeding. Caretakers' knowledge of breastfeeding is linked to better nutrition for children. Mothers/Caregivers who do not know about breastfeeding introduce solid foods to the children before commencing complementary feeding. Caregivers are also unaware of the hygiene to maintain while giving expressed breast milk, increasing the likelihood of infections. Malnutrition has two immediate causes, according to UNICEF's conceptual framework: disease and insufficient dietary intake. (Black et al., 2020).

5.3 Nutritional status of children in Daycare facilities

The prevalence of acute malnutrition in children in daycare facilities in Naivasha was 8%, and moderate and severe malnutrition was 7.1 and 0.9%, respectively. These weight for height malnutrition rates are lower than the county's 10% undernutrition rate. (Nutrition International, 2017). The stunting rates in Nakuru county are 28% (Nutrition International, 2017). However, from this study, the stunting rate of children in daycare facilities is 13.8%, which is way lower than the county's stunting levels.

The WHO classifies food into seven food groups to determine the Dietary Diversity score of the children's 0-24months (WHO et al., 2010). The major food groups consumed were grains, roots, and tubers (90.2%), while the least food group consumed by children was eggs (8%), followed by flesh foods (18%)

5.4 Relationship between dietary knowledge of daycare facility caregivers and mothers, the dietary practices, and the nutrition status of children raised in Naivasha daycare facilities

There is a positive association between the nutritional status of children in the daycare facilities and the dietary knowledge of the mothers and dietary practices in the daycare centers. Mothers with insufficient dietary knowledge are less likely to breastfeed and continue breastfeeding for up to 24 months exclusively. Children not exclusively breastfed are more likely to suffer from diarrhea, ARI, and fever (Khan et al., 2017). Insufficient dietary knowledge among caregivers in daycare facilities affects dietary diversity intake, a precursor for

malnutrition. Therefore, dietary knowledge among mothers and caregivers is a significant factor in the nutritional status of children in daycare facilities.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusions

Most mothers in the Naivasha of Nakuru County, Kenya, who leave their children in daycare facilities are young mothers of a mean age of 31 years and from a low-socioeconomic background with little property ownership and low education qualification. Although the minimum meal frequency is adequately met in the daycare facilities, consumption of iron-rich foods or iron-fortified foods is below the recommended intake. Exclusive breastfeeding is being achieved by the majority of mothers in Naivasha. Nutritional-related knowledge on breastfeeding and meal frequency is lacking among mothers and caregivers of daycare facilities in Naivasha. There is an association between dietary knowledge and dietary practices and the nutritional status of children. The low education status and low-socioeconomic backgrounds are the major contributing factor to the poor dietary practices. Inadequate dietary knowledge and dietary practices contribute to stunting, wasting, and undernutrition of children. Therefore, dietary factors influence the nutrition status of children 0-24months raised in the daycare centers in Naivasha.

6.2 Recommendations

Nutrition education should be conducted at community levels and daycare facilities to improve dietary knowledge. The mothers who leave their children in daycare facilities should also be taught about expressing breastmilk and safe storage. Nutrition education should also focus on dietary diversity, hygiene, and the need for vitamin supplementation and deworming. Promoting the economic policies that support entrepreneurial skills among young unemployed mothers to improve the income generation can also help improve the children's nutritional status. Improved income generation will enhance the economic status, which affects dietary diversity and dietary practices, consequently improving the nutritional status of the children. Credit access for women can also serve as a vehicle for women empowerment and thus enhanced income generation.

Finally, enhancing a nutrition-related enabling environment for children by regulating and licensing daycare facilities can serve as a regulatory framework against child abuse and illegal daycare facilities. Daycare facilities should be managed in a safe, hygienic environment and by a caregiver knowledgeable about dietary practices and hygiene.

REFERENCES

Black, M. M., Lutter, C. K., & Trude, A. C. (2020). All children surviving and thriving: re-envisioning UNICEF's conceptual framework of malnutrition. *The Lancet Global Health*, *8*(6), e766-e767.

Cherop, G. (2017). Dietary assessment and nutritional status of children (6-23 months) consuming local food recipes in Vihiga county, Western Kenya (Doctoral dissertation, University of Nairobi).

Clark, S., Kabiru, C. W., Laszlo, S., & Muthuri, S. (2019). The impact of childcare on poor urban women's economic empowerment in Africa. *Demography*, *56*(4), 1247-1272.

Gitonga, A. (2013). (https://www.standardmedia.co.ke/rift-valley/article/2000090423/naivasha-s-daycare-centres-linked-to-increase-in-rickets)

Henley, Phaedra & Lowthers, Megan & Koren, Gideon & Tsimbiri, Pamela & Russell, Evan & Vanuum, Stan & Arya, Sumedha & Darnell, Regna & Creed, Irena & Trick, Charles & Bend, John. (2014). Cultural and socio-economic conditions contribute to chronic stress in sub-Saharan African communities. Canadian Journal of physiology and pharmacology. 92. 1-8. 10.1139/cjpp-2014-0035.

Henley, Phaedra & Lowthers, Megan & Koren, Gideon & Tsimbiri, Pamela & Russell, Evan & Vanuum, Stan & Arya, Sumedha & Darnell, Regna & Creed, Irena & Trick, Charles & Bend, John. (2014). Cultural and socioeconomic conditions as factors contributing to chronic stress in sub-Saharan African communities. Canadian Journal of physiology and pharmacology. 92. 1-8. 10.1139/cjpp-2014-0035.

37

Jaya, Izham & Sidi, Fatimah & Ishak, Iskandar & Affendey, Lilly & A. Jabar, Marzanah. (2017).
A review of data quality research in achieving high data quality within organization.
Journal of Theoretical and Applied Information Technology. 95. 2647-2657.
10.5281/zenodo.5374545.

Kenya National Bureau of Statistics. (2019). 2019 Kenya Population and Housing Census
Volume II: distribution of population by administrative units.

Khan, M.N., Islam, M.M. (2017). Effect of exclusive breastfeeding on selected adverse health
and nutritional outcomes: a nationally representative study. *BMC Public Health* **17,** 889
https://doi.org/10.1186/s12889-017-4913-4

Marías, Y. F., and Peter Glasauer. *Guidelines for assessing nutrition-related knowledge, attitudes,
and practices*. Food and Agriculture Organization of the United Nations (FAO), 2014.

Mabele, S. D., Martha, W., Khaseyi, G., & VivianLumiti, A. (2018) Caregivers Knowledge,
Attitude and Practices For Inclusive Home Based Child Care And Education In Kenya.

Nutrition
International.(2020).(https://www.nutritionintl.org/wpcontent/uploads/2020/10/Nakuru-Pr
ofile_FINAL-WEB.pdf)

National Council for Population and Development (NCPD, 2020). State of Kenya Population
report   2020.
https://kenya.unfpa.org/sites/default/files/pub-pdf/state_of_kenya_population_report_202
0.pdf

Öngün Yılmaz, H., Aydın Haklı, D., Toğuç, H., Çobanoğlu, Z., Öner Sayar, C., Erkul, C., &
Günal, A. M. (2021). Nutrition knowledge scale (NKS): development, factor structure,
and validation for healthy adults. *Progress in Nutrition*.

Sassi, Maria. 2019. "Seasonality and Nutrition-Sensitive Agriculture in Kenya: Evidence from Mixed-Methods Research in Rural Lake Naivasha Basin" *Sustainability* 11, no. 22: 6223. https://doi.org/10.3390/su11226223

Shelley Clark, Midanna De Almada, Caroline W. Kabiru, Stella Muthuri & Milka Wanjohi (2021) Balancing paid work and child care in a slum of Nairobi, Kenya: the case for centre-based child care, Journal of Family Studies, 27:1, 93-111, DOI: 10.1080/13229400.2018.1511451

UNICEF, (2018). Annual report. For every child, every right https://data.unicef.org/topic/nutrition/malnutrition/

United Nations Children's Fund (Unicef), World Health Organization (WHO). (2019). Increasing commitment to breastfeeding through funding and improved policies and programmes-Global Breastfeeding Scorecard, 2019.

APPENDICES

APPENDIX 1: 24- HOUR RECALL QUESTIONNAIRE

Interviewer……………………………….

Interview date……………………………

Participant ID…………………………..

Participant's name………………………..

TIME	PLACE EATEN	DISH NAME	INGREDIENTS

APPENDIX 2: QUESTIONAIRE

TITLE: **DIETARY PRACTICES AND NUTRITIONAL STATUS OF CHILDREN 0-24**

MONTHS ATTENDING NAIVASHA DAYCARE CENTRES

Identity

Daycare center……………………………

Interview date……………………………..

Interviewer…………………………………

Respondent's name…………………………..

Gender…………………………………………

SECTION ONE	SOCIO-DEMOGRAPHIC AND ECONOMIC FACTORS	Appropriate codes
1.1	Age of the mother/ daycare facility caregiver	
1.2	Marital status 1. Married 2. Single	
1.3	Level of education of the mother/ daycare facility caregiver 1. Primary 2. Secondary 3. Tertiary	
1.4	Mothers' source of income 1. Salaried job 2. Casual job 3. Farmer 4. Business 5. Other	
1.5	For daycare facility caregivers: How long have you been working as a daycare facility caregiver 1. 0-6months 2. 6months-1year 3. More than 1year	

SECTION TWO	CHILD INFORMATION	

2.1	Name of the child
	
	DOB
	
	Age in months
	
	Gender
	
	   1. Female
	
	   2. Male	

SECTION THREE	INFANT AND YOUNG CHILD FEEDING PRACTICES (FAO, 2014)	
3.1	Has the child ever been breastfed 1. Yes, 2. No	
3.2	Was exclusive breastfeeding practiced 1. Fully 2. Partially	

3.3	**<u>Dietary diversity score</u>**
	
	I would like to ask you about other foods fed to the child even if the foods were combined with other foods yesterday day and night
	
	GRAINS, ROOTS, AND TUBERS, e.g., porridge, rice, maize, cassava, spaghetti, or other foods made from grains, roots, or tubers
	
	   1. Yes, 2. No
	
	LEGUMES AND NUTS, e.g., seeds, beans, peas, lentils, or nuts
	
	   1. Yes, 2. No	

	DAIRY PRODUCTS, e.g., infant formulae, powdered or tinned milk, fresh milk, or milk products like yogurt, cheese
	
	   1. Yes, 2. No
	
	FLESH FOODS, e.g., Organ meats, beef, fish, ducks
	
	   1. Yes, 2. No
	
	 EGGS
	
	   1. Yes, 2. No
	
	VITAMIN A FRUITS AND VEGETABLES, e.g., pumpkins, oranges, carrots, green leafy vegetables, ripe mangoes, papayas, and musk melons
	
	OTHER FRUITS AND VEGETABLES, e.g., cabbage, passion, tree tomatoes, pineapples
	
	   1. Yes, 2. No
	
	ANALYSIS
	
	The total food groups consumed are:	

3.4	**<u>Minimum meal frequency</u>** How many times did the child consume food (snacks, solids, or drinks) yesterday during the day and night	
3.5	**<u>Consumption of iron foods or iron-fortified foods</u>** Yesterday during the day and night, did the child consume any iron-rich foods or iron-fortified foods? 1. Yes, 2. No	
3.6	**<u>Micronutrient fortification</u>**	

	Did the child consume any food to which you added sprinkles or powdered (show some common micronutrient powders available in the survey area) 1. Yes, 2. No	
3.7	**Food Frequency Questionnaire** 	

SECTION FOUR	DAYCARE FACILITY CAREGIVER/MATERNAL KNOWLEDGE OF IYCF PRACTICES	
4.1	**Breastfeeding at birth** At birth, when should breastfeeding be initiated: 1. Within one hour 2. Others/ don't know	
4.2	**Exclusive breastfeeding meaning** What do you understand by the term exclusive breastfeeding? 1. This means the infant gets only breast milk and no other solid or liquid foods except when prescribed by the doctor. 2. Others/don't know	
4.3	**Length of exclusive breastfeeding** How long should exclusive breastfeeding be practiced? 1. First 6months of life 2. Others/don't know	
4.4	**Continued breastfeeding** How long should continued breastfeeding be practiced? 1. At least 24months 2. Others/don't know	
4.5	**Complementary feeding** When should complementary feeding be initiated 1. At 6months 2. Others/don't know	

4.6	**Meal frequency** How many times a day should the child be fed? 1. 2-3times(6-8months) 2. 3-4times(9-23months) 3. Others/don't know	
4.7	**Responsive feeding** 1. Paying attention, talking to the children, and making feeding time happy 2. Clapping hands 3. Get the child's attention 4. Play and make funny faces at feeding time 5. Others/Don't know	
SECTION FIVE	CHILD NUTRITION STATUS	
5.1	**Weight** Weight measured to the nearest 0.1kg twice Take the average to the nearest 0.1kg	
5.2	**Height** Height Weight measured to the nearest 0.1kg twice Take the average to the nearest 0.1kg measured to the nearest 0.1kg twice Take the standard to the nearest 0.1kg	
	THANKS FOR PARTICIPATING	

APPENDIX 3: DATA COLLECTION PERMITS

UNIVERSITY OF NAIROBI
Faculty of Agriculture
DEPARTMENT OF FOOD SCIENCE, NUTRITION AND TECHNOLOGY

PROJECT TITLE: DIETARY INTAKE AND NUTRITIONAL STATUS OF CHILDREN 0-24 MONTHS

RAISED IN NAIVASHA DAYCARE CENTRES

NAME OF THE DAYCARE INSTITUTION...... *BLESSED HANDS DAYCARE* ....

I..... *ONGOCHE MILLICENT* ....declare that, I am a student in the University of Nairobi taking MSC,

Applied Human Nutrition in the department of Food Science Nutrition and Technology. I have provided the

document having the information about my research study and I have explained the same. After the

discussion, I am satisfied that the participants have adequately understood about the information provided.

I have used a translator in the process.

Name and signature of principal researcher... *ONGOCHE MILLICENT* ....

Date.... *22/10/2021* ....

Name and signature of research supervisor...... *Dr. Dasel Mulwa Kaindi* ....

Date........ *18/10/2021* ....

Name and signature of daycare facility manager........... *BERNICE* ....

Date.... *22/10/2021* ....

47

UNIVERSITY OF NAIROBI
Faculty of Agriculture
DEPARTMENT OF FOOD SCIENCE, NUTRITION AND TECHNOLOGY

PROJECT TITLE: DIETARY INTAKE AND NUTRITIONAL STATUS OF CHILDREN 0-24 MONTHS

RAISED IN NAIVASHA DAYCARE CENTRES

NAME OF THE DAYCARE INSTITUTION.....*MAMA WATOTO DAYCARE*:

I....*ONGOCHE MILLICENT*....declare that, I am a student in the University of Nairobi taking MSC, Applied Human Nutrition in the department of Food Science Nutrition and Technology. I have provided the document having the information about my research study and I have explained the same. After the discussion, I am satisfied that the participants have adequately understood about the information provided. I have used a translator in the process.

Name and signature of principal researcher........*ONGOCHE MILLICENT*
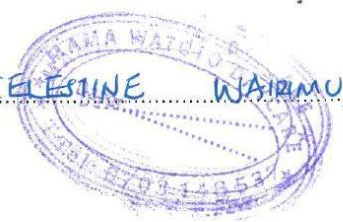
Date...*22nd OCT 2021*

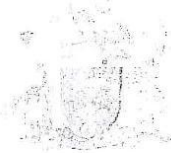Name and signature of research supervisor.:......*Dr. Dasel Mulwa Kaindi*

Date.....*18/10/2021*

Name and signature of daycare facility manager.........*CELESTINE WAIRIMU*

Date.....*22 | 10 | 2021*

UNIVERSITY OF NAIROBI
Faculty of Agriculture
DEPARTMENT OF FOOD SCIENCE, NUTRITION AND TECHNOLOGY

PROJECT TITLE: DIETARY INTAKE AND NUTRITIONAL STATUS OF CHILDREN 0-24 MONTHS

RAISED IN NAIVASHA DAYCARE CENTRES

NAME OF THE DAYCARE INSTITUTION... MiMi C.B.O DAYCARE.

I. ONGOCHE MILLICENT ....declare that, I am a student in the University of Nairobi taking MSC.

Applied Human Nutrition in the department of Food Science Nutrition and Technology. I have provided the

document having the information about my research study and I have explained the same. After the

discussion, I am satisfied that the participants have adequately understood about the information provided.

I have used a translator in the process.

Name and signature of principal researcher. ONGOCHE MILLICENT

Date. 21st OCT 2021

Name and signature of research supervisor... Dr. Dasel Mulwa Kaindi

Date... 18/10/2021

Name and signature of daycare facility manager... Virginia W. Kamay - Owner

Date... 22/10/2021

UNIVERSITY OF NAIROBI
Faculty of Agriculture
DEPARTMENT OF FOOD SCIENCE, NUTRITION AND TECHNOLOGY

PROJECT TITLE: DIETARY INTAKE AND NUTRITIONAL STATUS OF CHILDREN 0-24 MONTHS

RAISED IN NAIVASHA DAYCARE CENTRES

NAME OF THE DAYCARE INSTITUTION........ MAMA WAIRIMU DAYCARE............

I... Ongeche Millicent ....declare that, I am a student in the University of Nairobi taking MSC, Applied Human Nutrition in the department of Food Science Nutrition and Technology. I have provided the document having the information about my research study and I have explained the same. After the discussion, I am satisfied that the participants have adequately understood about the information provided. I have used a translator in the process.

Name and signature of principal researcher..... Ongeche Millicent

Date.... 21/10/2021

Name and signature of research supervisor..... Dr. Dasel Mulwa Kaindi

Date.... 18/10/2021

Name and signature of daycare facility manager.... MAMA WAIRIMU

Date.... 23/10/2021

51

UNIVERSITY OF NAIROBI
Faculty of Agriculture
DEPARTMENT OF FOOD SCIENCE, NUTRITION AND TECHNOLOGY

PROJECT TITLE: DIETARY INTAKE AND NUTRITIONAL STATUS OF CHILDREN 0-24 MONTHS

RAISED IN NAIVASHA DAYCARE CENTRES

NAME OF THE DAYCARE INSTITUTION.... LONGONOT .... DAYCARE ....

I... ONGOCHE ..... MILLICENT ....declare that, I am a student in the University of Nairobi taking MSC,

Applied Human Nutrition in the department of Food Science Nutrition and Technology. I have provided the

document having the information about my research study and I have explained the same. After the

discussion, I am satisfied that the participants have adequately understood about the information provided.

I have used a translator in the process.

Name and signature of principal researcher....... MILLICENT ONGOCHE .... M....

Date. 21ˢᵗ OCT 2021 ....

Name and signature of research supervisor..... Dr. Dasel Mulwa Kaindi ....

Date..... 18/10/2021 ....

Name and signature of daycare facility manager.......... SYLVIA ...... WAWERU ....

Date.... 23ʳᵈ 10 2021 ....