FACTORS ASSOCIATED WITH HYGIENE PRACTICES AMONG BREASTFEEDING MOTHERS ATTENDING MATERNAL AND CHILD HEALTH CLINIC AT MANDERA COUNTY REFERRAL HOSPITAL, KENYA.

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DECLARATION AND APPROVAL

Student Declaration

This is my original work and has not been submitted to any other institution of higher learning for an academic award.

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DEDICATION

I would like to dedicate this work to my family, you have been a pillar of strength throughout this endeavor.

ABSTRACT

Hygiene practices among breastfeeding mothers are critical in preventing infections and promoting the health of both mothers and infants. Poor hygiene practices contribute to high morbidity and mortality rates among children under five, particularly in resource-limited settings such as Mandera County, Kenya. This study aimed to assess the level of knowledge, attitudes, and hygiene practices among breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital. It also examined the economic, cultural, and family-related factors influencing hygiene practices and identified key barriers hindering proper hygiene practices. A cross-sectional descriptive research design was employed, utilizing both quantitative and qualitative data collection methods. A total of 360 breastfeeding mothers were systematically sampled, and data were collected using structured questionnaires, focus group discussions (FGDs), and key informant interviews (KIIs). Quantitative data were analyzed using SPSS Version 26, where descriptive statistics such as means, standard deviations, and percentages were used. Inferential statistics, including chi-square tests and logistic regression, were applied to establish associations between variables. Qualitative data were analyzed thematically. Findings revealed that only 42.5% of the respondents demonstrated adequate knowledge of breastfeeding hygiene, and 37.8% consistently adhered to recommended hygiene practices. Socioeconomic status, cultural beliefs, and family influence were significant determinants of hygiene practices ($\chi^2 = 18.27$, $p < 0.05$). Economic constraints such as lack of access to clean water and hygiene products (reported by 54.6% of respondents) were major barriers to proper hygiene. Additionally, 43.2% of mothers cited cultural taboos and traditional beliefs as influences on their hygiene behaviors, while healthcare workers played a vital role in providing hygiene education, but resource limitations affected their effectiveness. The study concludes that hygiene knowledge and adherence among breastfeeding mothers remain suboptimal, with economic and cultural factors significantly impacting hygiene practices. To address these challenges, the study recommends integrating hygiene education into routine MCH clinic visits, improving access to clean water and sanitation infrastructure, and implementing community-based interventions to address cultural misconceptions. Collaborative efforts involving policymakers, healthcare providers, and community stakeholders are necessary to enhance breastfeeding hygiene and reduce child morbidity and mortality in Mandera County.

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LIST OF ABBREVIATIONS AND ACRONYMS

GOK	- Government of Kenya
ICF	- Infant and Child Feeding
IYCF	- Infant and Young Children Feeding
KDHS	- Kenya Demographic Health Survey
KNBS	- Kenya National Bureau of Statistic
MCH	- Maternal & Child Health
MCRH	- Mandera County Referral Hospital
SDGs	- Sustainable Development Goals
MoH	- Ministry of Health
UN	- United Nations
UNICEF	- United Nations Children Emergency Funds
WASH	- Water Sanitation and Hygiene
WHO	- World Health Organization
HBM	- Health Belief Model

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter provides an overview of the research focus, outlines the significance of studying hygiene practices among breastfeeding mothers, introduces the Mandera County Referral Hospital as the research setting, and highlights the key factors that are anticipated to be associated with hygiene practices in this context. Hygiene practices are crucial elements of MCH, ensuring the well-being and optimal development of both mothers and infants. Among the various stages of maternal care, breastfeeding holds a unique significance due to its long-term health benefits for mother and child. The Mandera County Referral Hospital, serving as a pivotal healthcare center in this region, plays a critical role in providing comprehensive care to breastfeeding mothers and their infants.

1.1. Background

In regard to WHO (2018), hygiene refers to the situations and behaviors that support health maintenance and disease prevention. All infants and young children should be breastfed because it is healthy and encouraged (WHO 2018). Over 4-6 million under-five years are thought to have died globally from acute respiratory infections and diarrhea, with acute respiratory infections accounting for 47% of those deaths (Black et al., 2017). Infant mortality rates in particular and childhood mortality rates in general are indicators of health factors. One of the Sustainable Development Goals (SDG 2030) is to minimize child mortality by two thirds.

WHO (2016), states that 78% of under-five who die from diarrhea occur in the African and South-East Asian regions. Diarrhea primarily affects children for a variety of

reasons, including poor cleanliness. In the Arba Minch District of Ethiopia, the prevalence of diarrheal illness among under-five over a two-week period was estimated to be 31.0% (WHO, 2016).

Medical students' overall hand hygiene was mediocre, but it became better as their training went on. The assessment of outfit hygiene was found to be moderate, albeit not as much as that of hand hygiene. It was also found to be lower in males and to have decreased over time, suggesting that more reinforcement of clothing hygiene practices is necessary as clinical training advances. The majority of medical students felt that the hygiene of the equipment was inadequate, thus this needs to be brought up as a possible subject for improvement during clinical training. This study indicates that medical students' equipment and apparel hygiene knowledge, attitudes, and practices were not up to par and should be given more attention throughout medical clinical training (Kaur, Suseela, 2020).

Only 9.3% and 8.9% of women consistently cleaned their hands with the soap after using the restroom and before children feeding, according to another study. These results are less than those of a study carried out in Bangladesh, which found that 59.2% and 43.2% of mothers, respectively, consistently cleaned their hands with soap after using the restroom and before feeding their children (Demmelash et al., 2020).

In Kenya, lack of safe running water, mother or caregiver not washing hands after changing baby's napkins, lack of basic sanitation and hygiene are major factors leading to diarrhea among children. Children are more prone to contract diseases from mothers who don't practice good hygiene. According to UNICEF (2021c and 2019b), breastfeeding mothers' hygiene habits have significant impacts on mortality of under-fives. Breasts being connected with sexual behavior and pleasure and breastfeeding only being permitted in private settings are two cultural factors that are linked to cleanliness

practices among breastfeeding mothers. This may affect how nursing moms follow cleanliness rules like washing their breasts before nursing the infant because it makes them uncomfortable (UNICEF 2019). The hygiene practices that are normal and acceptable in a community are greatly influenced by its cultural norms and dominant ideas. Therefore, for the efficient execution of public health objectives, health public policies must always take into account the cultural status of a society, attitudes and beliefs prevailing in a place, and the values supported by the society (Demmelash et al., 2020)

Without breast hygiene, the baby can be put at the risk of becoming unwell with diarrhea and vomiting. Barriers to hygiene practices among breastfeeding mothers include, lack of clean running water, Lack of knowledge on the importance of observing good hygiene when breastfeeding and forgetfulness(Tsekleves et al., 2022). In Kenya's north eastern region is the county of Mandera. It shares boundary with Wajir County to west and south, Ethiopia to north, Somalia to east. Mandera Town serves as the nation's administrative center. Mandera County has a total area of 26,464 KM^2 and 1,025,756 inhabitants (KNBS, 2021). The county is primarily semi-arid; most places lacks stable water supply or the water mass therefore receive little annual rainfall. The vast majority of people are pastoralists who live nomadic lifestyles.

Mandera county is one of the most marginalized counties in the nation as a result of its harsh climatic conditions and underdeveloped infrastructure (KNBS, 2020). The county makes a substantial contribution to Kenya's economic strength in terms of economic activity. 90% of the wild game that supports the tourism industry is found there, and it produces between 50 and 70 percent of all cattle (GOK, 2016). Individual gains are modest in spite of this. About 13.3% of adults in the region depend on assistance from international and local NGOs because economic activity cannot provide means of

subsistence. Additionally, they don't make use of the local credit facilities that are already in place. Compared to a national average of 35%, only 4.5% of poor and 1.1% of non-poor people's sought credits in 2015 (KNBS, 2017).

The county's infrastructure is subpar, and the hospitals are spread out. Only 30% of the people reside within five kilometers of a medical center Despite having 52 registered health centers and 150 skilled workers, barely 10% of these were operating when the county took over the health sector. Maternal mortality rates are high in the area as a result of the scarcity of competent medical facilities and the difficulty in accessing the few that do exist. 3,795 deaths per 100,000 live births were documented in the county in 2012, with the bulk of these deaths being brought on by a lack of access to medical facilities. The number of baby fatalities during this year was the greatest ever, and the global rate of maternal mortality was also the highest ever (Uusimäki et al., 2023)

1.2 Statement of the problem

Acute respiratory infections and diarrhea are among the leading causes of child mortality, claiming the lives of 4–6 million children under five globally each year (WHO, 2021). Diarrhea alone accounts for approximately 47% of these fatalities, largely due to inadequate hygiene practices among caregivers, particularly breastfeeding mothers (UNICEF, 2020). Poor breastfeeding hygiene, including improper handwashing and contaminated feeding equipment, contributes significantly to the transmission of infections that lead to diarrhea, vomiting, and malnutrition (Black et al., 2019). Despite the well-established benefits of breastfeeding in boosting infant immunity, unhygienic practices can negate these benefits, exposing infants to life-threatening conditions (Kramer & Kakuma, 2019).

Cultural and societal factors further complicate the adoption of proper hygiene practices among breastfeeding mothers. In some communities, cultural taboos discourage breastfeeding in public, leading mothers to use unclean covers or restrict breastfeeding altogether (Gebreyesus et al., 2022). Other traditional beliefs dictate that mothers should not wash their breasts frequently, believing it can cause "milk loss" or other health complications (Ali et al., 2020). Such misconceptions hinder proper hygiene practices, putting infants at an increased risk of infections.

Additionally, environmental and economic factors contribute to poor breastfeeding hygiene. Many households in Mandera County rely on unsafe water sources such as rivers, boreholes, and wells, which increases the likelihood of microbial contamination (MoH Kenya, 2023). Studies have shown that limited access to clean water and poor sanitation contributes to up to 50% of childhood malnutrition cases due to repeated infections and poor nutrient absorption (Humphrey, 2019). Furthermore, time constraints, economic hardship, and lack of education on hygiene exacerbate the problem, making it difficult for mothers to maintain proper breastfeeding hygiene (Mosha et al., 2021).

The urgency of addressing these issues is particularly relevant to Mandera County, where child mortality rates remain high. According to the Kenya Demographic and Health Survey (KDHS, 2022), Mandera County has an under-five mortality rate of 97 deaths per 1,000 live births, one of the highest in Kenya. Furthermore, only 36% of households in the county have access to safe drinking water, and sanitation coverage is below 30%, significantly increasing the risk of hygiene-related diseases (KNBS, 2022). Studies conducted in similar arid and semi-arid regions in Kenya have indicated a strong correlation between poor maternal hygiene practices and high infant morbidity

(Wamalwa et al., 2020). However, limited research has specifically explored breastfeeding hygiene practices among mothers in Mandera County.

Therefore, this study seeks to fill this gap by investigating the key factors influencing hygiene practices among breastfeeding mothers attending Maternal and Child Health (MCH) services at Mandera County Referral Hospital. By identifying the economic, cultural, and environmental barriers affecting hygiene behaviors, this research will provide evidence-based recommendations for tailored interventions to promote proper hygiene among breastfeeding mothers. The findings will contribute to improved infant health outcomes, reduced childhood mortality, and strengthened maternal health policies in Mandera County and other similar regions.

1.4 Study Objectives

1.4.1 General objective

To investigate factors associated with hygiene practices among breastfeeding mothers attending MCH, Mandera County referral hospital

1.4.2 Specific Objectives

i. Assess the level of knowledge, attitudes, and hygiene practices among breastfeeding mothers attending MCH services at Mandera County Referral Hospital.

ii. Examine the economic, cultural, and family-related factors that influence hygiene practices among breastfeeding mothers at Mandera County Referral Hospital.

iii. Identify the key barriers that hinder breastfeeding mothers from maintaining proper hygiene practices at Mandera County Referral Hospital.

1.5 Research Questions

i. What is the level of knowledge, attitudes, and hygiene practices among breastfeeding mothers attending MCH services at Mandera County Referral Hospital?

ii. How do economic, cultural, and family-related factors influence hygiene practices among breastfeeding mothers at Mandera County Referral Hospital?

iii. What are the key barriers preventing breastfeeding mothers from maintaining proper hygiene practices at Mandera County Referral Hospital?

1.6 Significance and Justification of the study

This research will have a big influence on the health and happiness of breastfeeding women and their babies in Mandera County. By addressing the factors influencing hygiene practices, the study will inform targeted interventions, policy changes, and educational initiatives that promote proper hygiene practices, reduce infections burden and ultimately improve MCH outcomes in County.

Breastfeeding stands out as a cost-effective healthcare measure crucial for supporting infant and young child nutrition, health, and survival, as highlighted by the World Health Organization (WHO, 2015). However, globally, including in Kenya, unhygienic breastfeeding practices have contributed to a rise in diarrheal illnesses among children, posing significant challenges to reducing under-five mortality rates. Effective initiatives must be implemented to address this issue, with a primary focus on promoting good breast cleanliness. Sterilizing the breasts is commonly advocated to prevent diarrheal diseases associated with early food introduction and sustaining breastfeeding (Gizaw et al., 2017).

Studies from various regions, such as Northwest Ethiopia and rural Bangladesh, have revealed important insights. For instance, mothers who receive guidance on appropriate

weaning practices are more likely to adhere to them. Additionally, handwashing practices are significantly influenced by factors like the availability of water and soap, maternal education level, and accessibility of handwashing facilities near toilets (Chondra et al., 2017). However, research on breastfeeding mothers' hygiene behaviors in Kenya is limited. Many mothers lack awareness of critical breastfeeding hygiene practices, which adversely affects child health (Wanjohi et al., 2016). Therefore, this study is vital for identifying the determinants of breastfeeding mothers' cleanliness habits among attendees of the Mandera County Referral Hospital's Maternal and Child Health (MCH) services. The findings will inform interventions aimed at improving breastfeeding mothers' hygiene practices, thereby reducing the incidence of hygiene-related diseases like diarrhea among young children and enhancing overall healthcare outcomes. Additionally, this study can serve as a valuable resource for scholars interested in conducting similar research on this topic.

1.7 Limitation

This study faced several challenges that may have impacted the research process and outcomes.

The study was conducted in Mandera County, a region that has experienced inter-clan conflicts and periodic security threats, limiting mobility and access to some participants. This affected the ability to conduct extensive fieldwork in certain areas.

The population in Mandera County is largely pastoralist, with communities spread across vast areas. This made it difficult to reach potential respondents, increasing logistical challenges such as transportation and scheduling of interviews.

Many participants had limited formal education, which required additional efforts in explaining survey questions and ensuring informed participation in the study.

Some hygiene practices are influenced by cultural norms and taboos, making certain topics sensitive to discuss openly. This required careful community engagement and trust-building before data collection could take place.

1.7.1 Delimitation of the Study

This study was specifically focused on assessing the knowledge, attitudes, and hygiene practices among breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital. The following delimitations were established to ensure the study remained feasible and relevant:

The research was limited to breastfeeding mothers who regularly attended the MCH clinic at Mandera County Referral Hospital. Other healthcare facilities or home-based breastfeeding practices were not included.

The study was confined to Mandera County Referral Hospital, which serves as the main maternal and child health facility in the region. This allowed for a controlled environment where participants had similar access to healthcare services.

Only breastfeeding mothers were included in the study, excluding other caregivers such as fathers, grandmothers, or healthcare workers, even though they may influence hygiene practices.

The study primarily examined knowledge, attitudes, and hygiene practices, as well as economic, cultural, and family factors affecting hygiene. Other potential determinants, such as government policies or broader public health interventions, were beyond the scope of this study.

Data collection was conducted over a specified period, ensuring consistency in responses while limiting seasonal variations in hygiene practices that might have influenced findings.

1.8 Assumptions

Other factors that are associated with hygiene practices like; environment, health system support, social status, competing responsibilities were assumed to be constant in this study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

These chapters comprised of literature Reviews, theoretical frameworks and the Conceptual frameworks. In addition, the conceptual frame work summary is provided.

2.1 Review of Related Literature

An empirical literature review is a critical and systematic examination of existing research studies, articles, and academic literature that are based on direct observation or experimentation. It aims to summarize, evaluate, and synthesize the findings, methodologies, and conclusions of these studies to gain a comprehensive understanding of a particular research topic or area. Through this process, researchers can identify gaps, inconsistencies, and trends in the existing body of knowledge, which then informs the development of new research questions, hypotheses, and methodologies.

The empirical literature review serves as a foundational component of scholarly research and academic inquiry. Its significance lies in its ability to provide researchers with a solid framework for advancing knowledge, making informed decisions, and contributing meaningfully to their respective fields.

In essence, an empirical literature review bridges the gap between what is already known and what is yet to be explored. It enables researchers to engage in scholarly dialogue, contribute new insights, and drive the progress of knowledge within their chosen fields. Through a comprehensive review of relevant studies, researchers can lay a solid groundwork for their own investigations, ensuring that their research aligns with current knowledge and contributes to the ongoing advancement of academic thought.

2.1.1 Knowledge, Attitudes and Hygiene Practices Among Breastfeeding Mothers

There are approximately 525,000 deaths worldwide each year from infectious diseases, including childhood diarrhea, out of 1.7 billion cases that have been reported. South Asia and sub-Saharan Africa have the highest mortality rates among children under the age of two (Jiwok et al., 2021). Diarrheal diseases linked to the contamination of complementary foods cause 230,000 deaths annually (Jones, A.D.; Ickes, S.B.; Martin et al, 2021). Feeding contaminated complementary foods is directly linked to malnutrition, which is the root cause of 45% of deaths in children under the age of five (Jiwok et al., 2021). A child's risk of dying before turning five years old is influenced by a number of factors, including poor hygiene, the home environment, toilet facilities, cooking fuel, availability of refrigeration, drinking water, and household members (Bizzego et al., 2022). Disturbingly, diarrheal diseases account for eighty-eight percent of child deaths, and these can be avoided by expanding access to WASH services (Mebrahtom an al., 2022).

Epidemiological data suggests that the transmission of diarrheal diseases through food may be more significant than through waterChildren under the age of five are thought to bear 40% of the burden of foodborne diseases in African nations. Studies suggest that contaminated complementary foods may be the source of at least 70% of the pathogens linked to diarrhea in children. Over 30% of children under the age of five in Africa suffer from various microbial pathogen diseases.

There is scientific evidence that the growth, development, and survival of infants and children are significantly impacted by inadequate hygiene practices during complementary food feeding. For example, a study conducted in Malawi found that 27% of 6 to 24 month old children had diarrhea in the two weeks after the start of complementary feeding, which resulted in an 80% reduction in height and growth rate

and 20% underweight. Three studies conducted in rural India also showed a 25% to 50% prevalence of child stunting.

A study conducted in Malawi revealed that the prevalence of diarrhea in children under five years old was 43.4%. Of those children, 45.5% had their mothers preparing food on the floor; this was higher than the prevalence among those whose mothers used a table, 40.7%, and 48.2% when they used only water. Forty-three percent of mothers used soap and water for handwashing. It was suggested that maintaining basic hygiene and handwashing during complementary food preparation could reduce the spread of germs and prevent skin infections, acute respiratory infections like influenza, and diarrhea (Moncion et al., 2019).

As per the 2019 Mini Demographic and Health Survey in Ethiopia, 13% of mothers and babies receive complementary feeding (CF), and 43% of infant deaths are caused by avoidable bacterial pathogens. One of the main causes of diarrhea is poor food hygiene. Good CF practices include preparing complementary foods as hygienically as possible, making sure that there is enough food available at home, and implementing nutritional knowledge among caregivers. Research has shown that diarrheal diseases are more common after the introduction of contaminated complementary foods that introduce pathogenic microorganisms. (Gizaw et al., 2017).

In Ethiopia, preventing and managing foodborne infections in children aged 6-24 months involves an understanding of the hazards associated with hygiene procedures in complementary food feeding. Unfortunately, there are frequently barriers to putting these requirements into reality in Ethiopia, which exacerbates the problem of actual hygienic practices in complementary food feeding and has detrimental effects on health. To lower child morbidity and death, researchers advise evidence-based public awareness campaigns on inadequate supplemental food feeding practices and better access to health

education for caregiver mothers. Few research have been done on the extent and related variables of complementary food feeding hygienic practices among Ethiopian mothers of infants between the ages of six and twenty-four months. Reducing child morbidity and death is greatly aided by improving food hygiene standards. But the variables that contribute to inadequate hygienic practices for feeding supplemental foods are not adequately addressed, which emphasizes how crucial it is to give vulnerable age groups accurate information. Therefore, the purpose of the current study is to evaluate the degree and related variables of complementary food feeding hygienic practices among women in the Tegedie District, Northwest Ethiopia, who have infants between the ages of 6 and 24 months (Demmelash et al., 2020).

Significant global health concerns are posed by inadequate sanitation, hygiene, and access to safe drinking water, which results in the annual deaths of many children under the age of five, mostly from diarrheal diseases. The purpose of this study was to evaluate the effects of improving mothers' and children's health through sanitation and hygiene in Turkana District, one of Kenya's dry northern frontier districts. In a baseline survey done in 2007 and a post-intervention survey conducted in 2008, a total of 300 mothers were randomly interviewed using a repeat cross-sectional study design with a multi-stage sampling approach. Surveys were used to gather data, which SPSS was used to analyse using statistical tests such as regression, cross-tabulations, and frequencies.

The results showed that homes with handwashing soap, trash pit ownership, and handwashing routines had significantly improved. The purpose of the study was to understand how measures related to sanitation and hygiene affect certain health outcomes, specifically the incidence of diarrheal illnesses in children in Turkana District, Kenya. A capacity-building and empowerment strategy was used in the interventions,

which motivated communities to push for better sanitation and hygiene facilities (Amadu et al., 2023).

In Mandera County, the characteristics of households reveal a high level of illiteracy among caregivers, with 82.3% having no formal education, and a majority being housewives (53.6%). The average household size is notably high at 5.3 members, exceeding the national average reported in the KDHS 2014.

Young mothers often face challenges in disregarding advice from their less-educated elders (Nandagire et al., 2019). The primary sources of child feeding information for most caregivers are unskilled, primarily coming from their mothers or mothers-in-law and Community Health Volunteers. Due to a lack of knowledge about suitable foods for young children, coupled with cultural beliefs and practices, caregivers may not optimize the nutritional value of the available food in their households (Motebejana et al., 2022). Furthermore, women's literacy and numeracy skills acquired through education contribute to their ability to recognize illness and seek appropriate treatment for their children. Inadequate feeding practices during the complementary feeding period are expected to bring adverse effects on child health, emphasizing the necessity of educational interventions on infant and young child feeding (Nandagire et al., 2019).

Most breast-feeding mothers have a positive attitude towards adopting new behaviors in order to minimize health risks to their babies and are open to learn hygienic practices they can adopt to improve their children health (Dukuzumuremyi et al., 2020). Mother’s inadequate knowledge towards breastfeeding may influence practices and constitute barriers to proper hygienic practices among nursing mothers. Most mothers attending MCH at MCRH are uneducated; they have low standards of livelihood. They lack knowledge on hygiene factors such as hand washing after changing the baby's diapers and hygiene practices such as Use of the right medium for breast hygiene e.g., not using

soap or lotion on nipples, using nursing pads and changing them frequently(Zaltron, 2017)

Most breastfeeding mothers wear the wrong type of bras that have materials that do not allow breasts to breathe. Most of them do not know the importance of cotton bras which is drying quickly, letting the skin breath and preventing growth of harmful bacteria (Zaltron, 2017)

2.1.2 Economic, Cultural and Family Factors Affecting Hygiene Among Breastfeeding Mothers

When measuring hygiene practices among breastfeeding mothers, several major factors can influence and shape these practices. Economic, cultural, and family background are key indicators that should be considered and measured to gain comprehensive knowledge of context and determinants of maternal hygiene practices. Economic Factors: Access to Sanitation and clean water: Measure the accessibility and availability of clean water sources and sanitation facilities for breastfeeding mothers and their families. This can include assessing the distance to water sources, availability of soap, and hygiene-related infrastructure.

Hygiene Products: Assess the affordability and availability of hygiene products such as sanitary pads, soap, detergent, and breastfeeding equipment (if applicable) for different economic groups. Nutritional Resources: Evaluate the economic conditions that impact the availability of nutritious food for mothers, as proper nutrition contributes to overall hygiene and health (Felice et al., 2017). Cultural Factors: Cultural Beliefs and Practices: Conduct qualitative research, surveys, or interviews to explore the cultural beliefs and practices that influence hygiene practices. Understand how traditional customs, taboos, and rituals impact postpartum and breastfeeding hygiene. Menstrual Hygiene:

Investigate how cultural norms and perceptions affect menstrual hygiene practices and access to sanitary products. Breastfeeding Practices: Explore cultural attitudes towards breastfeeding, including beliefs about breastfeeding hygiene, nipple care, and breastfeeding in public. Family Background: Social Support: Measure the level of support from family members, partners, and extended family in promoting and facilitating proper hygiene practices. This can include involvement in caregiving, access to hygiene resources, and emotional support. Educational Background: Assess the education levels of breastfeeding mothers and their families, as higher education levels may correlate with better understanding and adoption of hygiene practices. Economic Status: Examine the socioeconomic status of the family, including income levels, occupation, and household resources, as these factors can influence access to hygiene resources. (Wanjohi et al., 2016)

Cultural taboos and precepts may be detrimental to breastfeeding habits. According to a study conducted in Cameroon, there are cultural and traditional behaviors and beliefs that motivate mothers to use mixed feeding. These include family pressure to supplement because it is believed that breast milk is inadequate and does not improve an infant's weight. In Kenya, there is a widely held idea that feeding infants younger than six months old exclusively by breastfeeding is insufficient. This led to supplementing, with 36% of infants fewer than six months receiving free meals as a result. High standards of hygiene should be followed by the mother when additional foods are provided in order to enhance the baby's health. The mother should wash her hands with soap and warm water, and sanitize the feeding supplies.

Income and Economic Status: The economic situation of families can impact their ability to afford hygiene products, clean water, and nutritious food. Lower-income households might face challenges in accessing necessary resources for maintaining good hygiene.

Education: Maternal education can influence hygiene practices. Mothers with higher levels of education might be more aware of the importance of hygiene and have better access to health-related information. Access to Sanitation and Clean Water; accessibility and Availability of clean water sources and proper sanitation amenities are crucial for maintaining hygiene practices. Limited access to clean water can hinder proper hygiene routines. Hygiene Products: The ability to afford and access hygiene products such as soap, sanitary pads, and cleaning supplies can impact the hygiene practices of breastfeeding mothers. Healthcare Access: Healthcare services accessibility and availability, including postnatal and antenatal care, may influence the guidance and education mothers receive about hygiene practices. Employment and Occupation: Mothers' employment status and working conditions can affect their ability to practice good hygiene, especially during breastfeeding breaks. Social Support: The presence of a supportive social network, including family members and community members, can influence hygiene practices by providing assistance, advice, or resources. Cultural Factors: Cultural beliefs and norms may shape hygiene practices. Understanding cultural practices related to postpartum care and breastfeeding can provide insights into hygiene behaviors. Household Infrastructure: The physical condition of housing and household infrastructure can impact hygiene practices. Adequate facilities for personal hygiene are important for maintaining cleanliness. Food Security: Access to nutritious food is essential for maintaining overall health and hygiene, especially for breastfeeding mothers. (Darin-Mattsson et al., 2017).

Individual personal factors influencing hygiene practices among breastfeeding mothers in Mandera East Sub-County, Mandera County, Kenya, can have a significant impact on how mothers' approach and prioritize hygiene during breastfeeding. These factors can vary widely and may influence the choices and behaviors of breastfeeding mothers. Here

are some potential individual personal factors to consider: Knowledge and Awareness: Mothers' understanding of the importance of hygiene practices during breastfeeding plays a critical role. Knowledge about proper handwashing, breast hygiene, and storage of breast milk can influence their behavior. Attitudes and Beliefs: Personal attitudes and cultural beliefs about hygiene, breastfeeding, and postpartum practices can shape a mother's approach to hygiene.

Positive attitudes towards cleanliness and health may lead to more consistent hygiene practices. Self-Efficacy that is confidence in one’s ability to practice proper hygiene, especially during breastfeeding, may influence their behaviors. Mothers with greater self-efficacy can be more proactive in maintaining hygiene practices. Health Literacy: The ability to understand health information and apply it to one's own situation affects hygiene practices. Mothers with higher health literacy may better comprehend the importance of hygiene and follow recommended practices. Time Constraints: The availability of time and the demands of caregiving and household responsibilities can impact a mother's ability to dedicate time to proper hygiene practices.

Personal Hygiene Habits: General personal hygiene habits, such as handwashing frequency and cleanliness, can extend to hygiene practices during breastfeeding. Motivations and Goals: Personal motivations, such as the desire to ensure the health and well-being of the infant, can influence a mother's commitment to practicing good hygiene. Cultural and Social Norms: Individual adherence to cultural norms, such as postpartum practices and traditional beliefs, can guide hygiene behaviors. Prior Experience: Previous experiences with breastfeeding and hygiene practices may influence a mother's approach with subsequent pregnancies. Psychological and Emotional Factors; psychological and emotional well-being factors, such as anxiety and stress may impact a mother's ability to prioritize and maintain hygiene practices.

Access to Resources: Individual access to clean water, hygiene products, and proper sanitation facilities affects a mother's ability to carry out recommended hygiene practices. Support System: The presence of a supportive partner, family members, or friends who encourage and assist with hygiene practices can play a role. Coping Strategies: Personal strategies for coping with challenges or barriers to hygiene practices can affect a mother's behavior. When conducting research on individual personal factors that influence hygiene practices among breastfeeding mothers in Mandera East Sub-County, qualitative methods such as interviews and focus groups can be valuable in exploring these factors in-depth.

2.1.3 Barriers to Hygiene Practices Among Breastfeeding Mothers.

Despite the benefits of maintaining cleanliness while breast feeding that have been extensively documented, many moms fall short of their own expectations due to a variety of causes. One of the challenges for breastfeeding women to practice good hygiene is poverty and low living circumstances. Remote Indigenous Communities' high degrees of social, economic, and environmental adversity are to blame for their health issues. Only between 38% and 69% of homes in rural indigenous communities in Australia had all the functional elements needed to carry out healthy living practices, such as the ability to cook and store food, wash people, and have a working toilet(Rah et al., 2015). Breastfeeding mothers living under such standards of living are likely not to observe proper hygiene. Some breastfeeding mothers attending MCH in MCRH are single mothers therefore they are the breadwinners in their families hence they lack enough time to observe hygiene practices such as sterilization of baby's feeding equipment's. Lack of knowledge on proper hygiene, inadequate access to clean and safe water, Ignorance and forgetfulness are also some barriers to observing hygiene among breastfeeding mothers (Rah et al., 2015)

The greatest method of feeding a newborn is by breastfeeding, however women must adhere to particular hygienic precautions to keep the baby healthy (,WHO 2020). Every year, almost 10 million children may away, primarily from diseases that could be prevented. including diarrhea, malaria, and measles, according to UNICEF. These factors include the child's food, the quality of the water, and the cleanliness of objects (UNICEF, 2018). The age of the kid and the season have a big impact on the prevalence of diarrheal illnesses. The youngest children are most vulnerable because the incidence is highest during the first two years of life (Demmelash et al., 2020). To save their children from the risk of diarrhea, breastfeeding mothers should practice strict cleanliness standards.(Demmelash et al., 2020)

In an effort to reduce baby diarrheal morbidity, encouraging good infant feeding habits and enhancing environmental cleanliness have been two key measures. Breast swelling alone or in conjunction with an infection is known as mastitis, a common issue with nursing. Up to 20% of breastfeeding mothers are impacted. It may be caused by germs, infections, or other pathogens that enter the body through cracked nipples. Mastitis can also result from wearing a tight bra or a nursing bra that doesn't fit properly. By often replacing breast pads to stop bacterial growth, it can be avoided (Kaur, Suseela, 2020).

2.2 Theoretical Literature Review.

The best way to ensure a baby's normal growth and development is to breastfeed. When nursing, proper cleanliness is crucial since it helps to keep the infant healthy. The most natural food for the newborn is breast milk. The early years of a baby's life are a time when their immune system is developing, and it provides the nutrients and antibodies the newborn needs to help them grow and fight disease and infection. Before every feeding, good cleanliness should be practiced to prevent the spread of pathogens to the infant (UNICEF, 2015).

In order to promote the best possible growth, development, and health of children, WHO has ruled that feeding bottles with nipples should never be used (WHO, 2017). Despite this, bottle feeding infants continues to be popular due to a variety of social and cultural factors. Compared to children who are not bottle fed, children who are bottle fed have an increased chance of developing diarrhea. For this reason, feeding bottles should always be sanitized before use (UNICEF, 2018c and UNICEF, 2019b).

Mothers who neglect to properly clean their breasts and nipples expose their children to a number of illnesses and infections. Fever, diarrhea, vomiting, and appetite loss are a few of the diseases and frequent ailments that can develop as a result of a child sucking on filthy breasts.(Birhanu et al., 2023)

The baby may suffer from cracked nipples or any nipple infection. The majority of breastfeeding mothers who use MCH at MCRH, Mandera East do not prepare their breasts for nursing. Due to Kenya's cultural practice of sexualizing breasts, most of them are timid and unable to clean their animals in public before feeding the baby. Due to the shortage of taps with clean flowing water at the hospital's MCH unit, the majority of them do not wash their hands before feeding their newborns. Some of the women can breastfeed their infants without washing their hands after using the restroom. Most women don't wash their hands after changing the baby's diapers and can start breastfeeding right away. This is a result of ignorance, a lack of knowledge, and sloth. The moms who attend MCH in the hospital are mostly from low-income families and lack education, thus they are unaware of how crucial it is to practice good hygiene when nursing (Sahoo et al., 2021)

Most breast-feeding mothers have a positive attitude towards adopting new behaviors in order to minimize health risks to their babies and are open to learn hygienic practices they can adopt to improve the health of their children (Gupta et al., 2018) Mother’s

inadequate knowledge towards breastfeeding may influence practices and constitute barriers to proper hygienic practices among nursing mothers. (Gupta et al., 2018)

Most breastfeeding mothers wear the wrong type of bras that have materials that do not allow breasts to breathe. Most of them do not know the importance of cotton bras which is drying quickly, letting the skin breath and preventing growth of harmful bacteria.

The greatest method of feeding a newborn is by breastfeeding, however women must adhere to particular hygienic precautions to keep the baby healthy (Taddese et al., 2020).

Greater than 10 million children die yearly, commonly from the preventable diseases including diarrhea, malaria, and measles, according to UNICEF. These factors include the child's food, the quality of the water, and the cleanliness of objects (UNICEF, 2017b).

The age of the kid and the season have a big impact on the prevalence of diarrheal illnesses. The incidence is highest in 1st two years of life, making the younger children most susceptible. (Kakute.P.N..Ngum 2015; Donna Murray 2017; Martin et al, 2021). To save their children from the risk of diarrhea, breastfeeding mothers should practice strict cleanliness standards.In an effort to reduce baby diarrheal morbidity, encouraging good infant feeding habits and enhancing environmental cleanliness have been two key measures. Numerous researchers have found link between breastfeeding and non-communicable diseases number. Breast swelling alone or in conjunction with an infection is known as mastitis, a common issue with nursing. Up to 20% of breastfeeding mothers are impacted. It may be caused by germs, infections, or other pathogens that enter the body through cracked nipples. Mastitis can also result from wearing a tight bra or a nursing bra that doesn't fit properly. By often replacing breast pads to stop bacterial growth, it can be avoided (Zaltron, 2017)

2.2.1 Behavioral Change Model

A behavioral model, in the context of psychology and behavior analysis, refers to a theoretical framework or approach that seeks to explain and understand human behaviors based on the observable actions and interactions with environment. Behavioral models focus on studying the relationship between stimuli (events or circumstances) and responses (behaviors) without necessarily delving into internal mental processes. This approach emphasize on importance of environment and learning experiences in shaping behavior. (*B.F. Skinner, 2021,* "Science and Human Behavior")

One of the prominent figures associated with the development of behavioral models is B.F. Skinner. He was a pioneering psychologist and behaviorist who formulated the theory of operant conditioning, which is a fundamental concept within behavioral psychology. Skinner's work emphasized the role of reinforcement and punishment in shaping behavior. He conducted extensive research using controlled laboratory experiments with animals, particularly pigeons and rats, to investigate how behaviors are acquired, maintained, and modified through various environmental contingencies. *(B.F. Skinner, 2021*)

Skinner's ideas and research laid the foundation for the behavioral perspective in psychology, which has had a significant influence on fields such as education, therapy, and behavioral interventions. It's important to note that while Skinner's work is a cornerstone of behavioral psychology, there have been other important contributors to the field as well, each adding to the understanding of behavior and its underlying mechanisms. *(B.F. Skinner, 2021*)

In the context of hygiene practices, behavioral models can provide insights into understanding and promoting behaviors related to cleanliness, health, and sanitation. B.F.

Skinner's operant conditioning, a key element of behavioral models, can be applied to encourage and reinforce hygienic behaviors. Here's how:

Positive Reinforcement: Positive reinforcement involves providing rewards to increase the likelihood of a behavior occurring. In the context of hygiene practices, individuals can be positively reinforced for behaviors like washing their hands before their meal or after use of restrooms. For example, parents might offer praise or small rewards to their children for consistently practicing good hygiene.

Negative Reinforcement: involves avoiding or removing aversive stimulus to increase likelihood of behavior. An example could be using hand sanitizer to avoid the discomfort of germs on hands after touching surfaces in public places.

Punishment: While punishment is generally not the preferred approach in behavioral models, mild forms of punishment could be used to discourage unhealthy hygiene behaviors. For instance, people might be less likely to touch their face if they experience a mild, harmless discomfort after doing so.

Extinction: Extinction involves withholding reinforcement to decrease the occurrence of a behavior. If someone frequently fails to wash their hands before eating and receives no positive attention from doing so, the behavior might diminish over time.

Modeling and Observational Learning: Behavioral models also consider observational learning, where individuals learn by observing the actions and consequences of others. Public health campaigns and educational programs that showcase proper hygiene practices and their positive outcomes can influence people to adopt similar behaviors.

Behavioral contracts and goal setting: Setting goals and creating behavioral contracts can be effective ways to promote hygiene practices. Individuals can commit to specific hygiene behaviors and receive rewards upon successful completion.

Social norms and peer pressure: Behavioral models recognize the impact of social norms and peer pressure on behavior. Public messaging that emphasizes the prevalence of healthy hygiene practices within a community can encourage individuals to conform to these norms.

2.2.2 Social Cognitive Theory (SCT)

Social Cognitive Theory, formulated by Albert Bandura in response to the limitations of behaviorist perspectives, offers a nuanced understanding of human behavior. Central to this theory is the concept of observational learning, wherein individuals acquire new behaviors by observing others. The process extends beyond direct interactions, encompassing influences from media sources. Bandura introduced the idea of reciprocal determinism, underscoring the dynamic relationship between personal factors, the environment, and behavior. This bidirectional interaction posits that individuals actively shape their environments through their actions. Self-efficacy, a pivotal element, refers to one's belief in their ability to execute specific behaviors successfully. The theory also emphasizes vicarious reinforcement, whereby individuals are influenced by observing the consequences of others' actions. Social Cognitive Theory finds applications in diverse domains. In education, teachers can leverage modeling techniques to foster positive learning environments. Health campaigns utilize the theory to promote healthier lifestyles by showcasing positive behaviors and enhancing individuals' self-efficacy. In criminal justice, the theory helps unravel the acquisition of criminal tendencies through exposure to deviant influences. Despite its contributions, critiques suggest that the theory may oversimplify human behavior and overlook biological influences. Nonetheless, by illuminating the intricate interplay between individuals, cognition, and the environment, SCT remains a valuable framework for understanding and influencing human behavior across multiple disciplines.

2.2.3 Transtheoretical Models

Transtheoretical Models (TTM) are a family of psychological theories that have significantly contributed to the understanding and facilitation of behavior change. The foundation of TTM was laid by James O. Prochaska and Carlo C. DiClemente in the late 1970s, arising from their research on smoking cessation. One of the distinguishing features of TTM is its acknowledgment that behavior change is a dynamic and non-linear process. The model recognizes that individuals may cycle through different stages when contemplating and making changes in their behavior, and this cyclical nature sets TTM apart from more linear models of change.

The six stages in the TTM offer a structured framework to describe an individual's readiness to change. In the precontemplation stage, people may be unaware of the need for change, while the contemplation stage marks the acknowledgment of a problem or the consideration of altering behavior. Planning for change is part of the preparation stage; putting particular behavior modification methods into practice is part of the action stage; and maintaining the changed behavior over time is the emphasis of the maintenance stage. The termination stage, while not always applicable, denotes the time at which the new habit has become so ingrained that there is little chance of a return.

One of the strengths of TTM lies in its ability to integrate principles from various therapeutic approaches. It is considered a "transtheoretical" model precisely because it transcends specific theoretical orientations. Instead, it incorporates elements from cognitive-behavioral therapy, motivational interviewing, and other psychotherapeutic approaches, making it adaptable to a wide range of behavioral challenges.

The application of TTM is evident in numerous domains. From smoking cessation and weight management to substance abuse treatment and mental health interventions, TTM

has been utilized to tailor interventions according to an individual's stage of change. For instance, someone in the precontemplation stage might benefit more from interventions that raise awareness and highlight the need for change, while someone in the action stage may require strategies to overcome obstacles and maintain progress.

By offering a comprehensive understanding of the dynamic process of behavior change, Transtheoretical Models provide a valuable tool for practitioners and researchers. The emphasis on individualized interventions based on the specific stage of change enhances the effectiveness of behavioral interventions, promoting sustainable transformations in individuals' lives across a spectrum of contexts and challenges.

2.3 Conceptual Framework

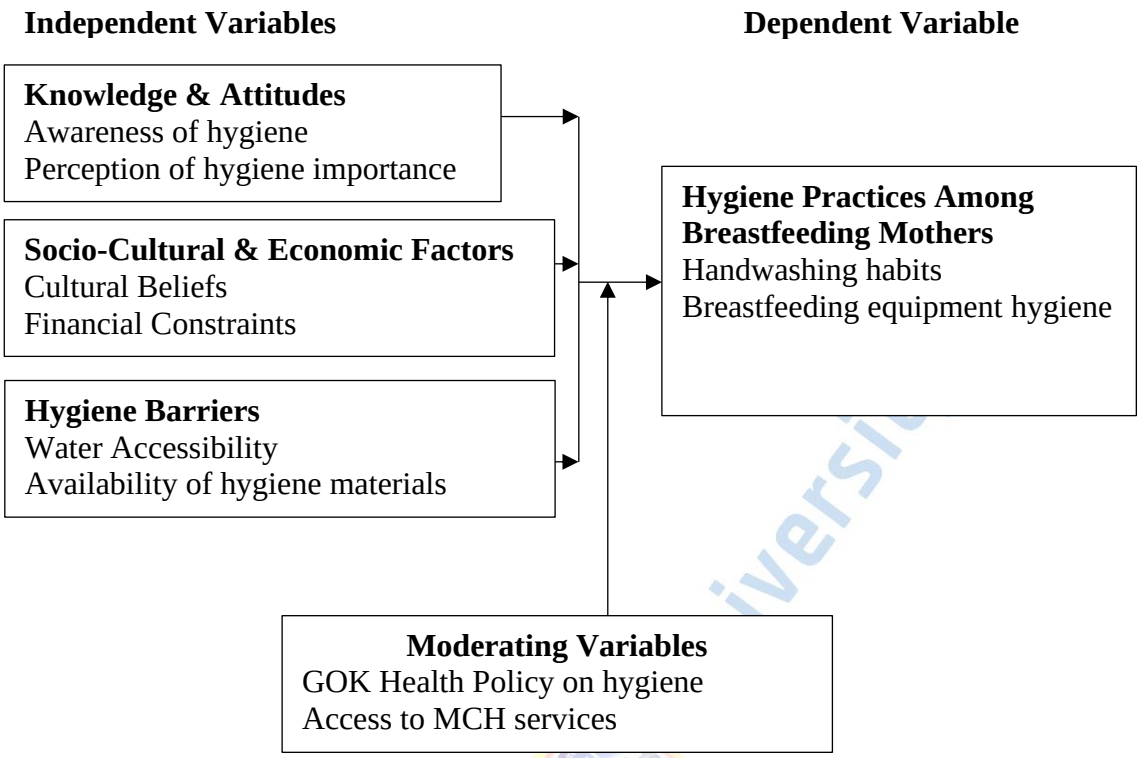

Figure 1: Conceptual Framework

A conceptual framework is a critical tool in research, especially when investigating complex phenomena like factors associated with hygiene practices among breastfeeding mothers. The study context focused on women attending the MCH, Mandera County Referral Hospital, Kenya. A conceptual framework offers several important benefits: Guidance for Research Design: A conceptual framework provides a structured outline for your research design. It helps you identify the key variables, relationships, and interactions that you intend to study.

This clarity ensures that your research is focused and well-defined. Theoretical Foundation: A conceptual framework allows you to draw upon existing theories and concepts that explain hygiene practices and related factors. This theoretical foundation gives your study depth and credibility by situating it within a broader academic context. Hypothesis Development: The framework assists in formulating hypotheses or research

questions. By identifying the relationships between variables, you can generate informed hypotheses about how different factors influence hygiene practices among breastfeeding mothers. Identification of Variables: It helps you identify the specific factors that could impact hygiene practices. These factors could include socio-economic status, cultural norms, access to resources, health beliefs, and more. Focus on Key Factors: With a conceptual framework, you can prioritize the most relevant and influential factors for your study. This prevents you from collecting unnecessary data and ensures your research is efficient.

Data Collection and Analysis: The framework guides your data collection by suggesting which variables to measure and how to operationalize them. It also aids in organizing and analyzing collected data, making the process more coherent. Interpretation of Findings: When you have a conceptual framework in place, interpreting your research findings becomes more systematic. You can relate your results back to the relationships and interactions you identified, enhancing the depth of your analysis. Applicability of Results: A well-constructed framework ensures that your findings have practical implications. The insights you gain can be applied to targeted interventions development, policies or programs to improve hygiene practices among breastfeeding mothers.

Communication and Collaboration: A conceptual framework facilitates communication with fellow researchers, advisors, and stakeholders. It's a visual representation that helps others understand the scope and focus of your study. Future Research and Theory Development: Your conceptual framework can contribute to the advancement of knowledge in the field. It can serve as a basis for future research, potentially leading to the development or refinement of existing theories. In summary, a conceptual framework is a roadmap that guides your research process, from the formulation of research questions to the interpretation of results. It provides a clear structure for understanding

the complex web of factors that influence hygiene practices among breastfeeding mothers and ensures that your study is grounded in theory, well-organized, and meaningful in its contributions to knowledge and practice

2.4 Research Gaps

A critical review of a study aiming to establish gaps in factors associated with hygiene practices among breastfeeding women attending MCH services, Mandera County Referral Hospital would involve evaluating various aspects of the study design, methodology, and potential limitations. Critical review of the study would assess its strengths and weaknesses in terms of research design, methodology, analysis, ethical considerations, and contextual relevance. This review process helps ensure that the study's findings are robust, credible, and valuable for informing both academic understanding and practical interventions related to hygiene practices among breastfeeding mothers attending the MCH services at Mandera County Referral Hospital.

Conducting hygiene promotion research can be challenging due to various factors, both logistical and contextual. These challenges can impact the design, implementation, and interpretation of research findings. Here are some global challenges associated with conducting hygiene promotion research: Cultural Diversity: Hygiene practices are deeply rooted in cultural norms and beliefs. Researchers must navigate diverse cultural contexts and ensure that interventions and research methodologies are culturally sensitive and acceptable. Language and Communication: Conducting research in different languages can pose communication barriers, affecting data collection and participant engagement. Translation and interpretation services may be required.

Access to Remote Areas: In many regions, especially rural or remote areas, access to communities and participants can be challenging due to inadequate infrastructure,

transportation, and communication facilities. Limited Resources: Hygiene promotion research often takes place in resource-constrained settings where funding, equipment, and qualified personnel may be limited. Researchers must find innovative ways to maximize resources. Data Collection Challenges: Collecting accurate and reliable data on hygiene practices, particularly those that involve personal behaviors, can be challenging due to social desirability bias and recall errors.

Participant Engagement: Engaging participants in hygiene research can be difficult, especially if the interventions require behavior change. Motivating individuals to adopt new practices and sustain them over time is a complex process. Ethical Considerations: Respecting cultural norms, ensuring informed consent, and protecting participant privacy can be complex in cross-cultural research. Ethical standards may vary, and obtaining consent may require different approaches. Gender Dynamics: Hygiene practices are often influenced by gender roles and norms. Research must consider how gender dynamics impact participation, behavior change, and data collection.

Long-Term Sustainability: Ensuring that hygiene practices are sustained beyond the research period is a challenge. Developing interventions that lead to lasting behavior change is essential but can be difficult to achieve. Measuring Behavior Change: Accurately measuring behavior change, especially in the context of hygiene practices, can be challenging. Objective measurement methods may be needed to complement self-reported data. Data Analysis Complexity: Analyzing hygiene promotion data can be complex due to the interplay of individual behaviors, community factors, and cultural influences. Appropriate statistical and qualitative analysis methods are needed. Government and Policy Context: Research findings may need to align with local policies and priorities, which can influence the design and implementation of hygiene promotion interventions.

Health Infrastructure: Research may take place in areas with inadequate healthcare infrastructure. Collaborating with local health systems and organizations is crucial for successful implementation. Changing Sociopolitical Conditions: Political instability, conflicts, and other sociopolitical factors can disrupt research activities and impact the safety of researchers and participants. Global public health Crises like pandemics may disrupt research timelines, data collection, and participant engagement, highlighting the need for flexible research approaches.

Overcoming these challenges requires careful planning, collaboration with local stakeholders, adaptation of research methodologies, and a deep understanding of the local context. It is essential to prioritize cultural sensitivity, community engagement, and sustainable solutions when conducting hygiene promotion research in diverse global settings. After critically reviewed, I found that this study is essential for preventing diseases, improving health outcomes, and promoting overall well-being. It empowers communities, informs policies, and contributes to global efforts in achieving better public health and sustainable development.

CHAPTER THREE

METHODOLOGY AND MATERIALS

3.0 Introduction

This research proposal's methodology chapter provides a thorough description of the techniques, processes, and research design that will be used to answer the questions and goals of the study. This chapter delineates the steps taken to collect, analyze, and interpret data in order to contribute meaningfully to the understanding of hygiene practices among breastfeeding mothers attending the MCH clinic at Mandera County Referral Hospital.

3.1 Study design

The researcher employed a cross-sectional descriptive study approach. Cross-sectional studies are observational research projects that examine demographic data collected at one particular period in time. They are frequently employed to quantify the frequency of health outcomes, comprehend health factors, and characterize characteristics of a population.

3.2 Study Approach

A sequential explanatory mixed-methods research design was employed to examine the factors influencing hygiene behaviors among breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital, Mandera County, Kenya. The study was conducted in two phases:

Structured questionnaires were administered first to collect numerical data on knowledge, attitudes, hygiene practices, and influencing factors among breastfeeding mothers. This allowed for statistical analysis and identification of patterns and relationships among variables.

After analyzing the quantitative results, Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) were conducted to provide deeper insights into the quantitative findings. The qualitative data helped to explain the trends observed in the survey by capturing the lived experiences, cultural perceptions, and contextual challenges affecting hygiene practices.

By integrating both quantitative and qualitative data, the study provided a comprehensive understanding of the complex interplay of knowledge, socio-cultural influences, economic constraints, and hygiene-related behaviors among breastfeeding mothers. This approach ensured that findings were both statistically robust and contextually meaningful, informing targeted interventions to improve maternal and child hygiene practices.

3.3 Study Location

Mandera County is situated in northeastern Kenya, bordering Ethiopia to the north and Somalia to the east. It was formerly part of the North Eastern Province. The county covers approximately 25,991.5 km² and has an estimated population of 867,457 as per the 2019 Kenya Population and Housing Census (KNBS, 2019). The majority of the population belongs to the Somali ethnic group, whose livelihoods are predominantly based on nomadic pastoralism and cross-border trade with Ethiopia and Somalia.

The Mandera County Referral Hospital (MCRH) was chosen as the study site due to the following reasons:

According to the Kenya Demographic and Health Survey (KDHS, 2022), Mandera County records some of the highest child mortality rates in the country, with under-five mortality at 91 deaths per 1,000 live births significantly above the national average. Poor hygiene practices among breastfeeding mothers are a key contributor to these high

mortality rates, particularly due to diarrheal diseases and respiratory infections. Studies indicate that inadequate handwashing practices and poor maternal hygiene behaviors are major causes of preventable childhood illnesses in arid and semi-arid regions like Mandera (MOH, 2021).

Mandera County has one of the lowest access rates to clean water and sanitation in Kenya, with only 38.9% of households accessing improved water sources, compared to the national average of 59.1% (UNICEF, 2021). Frequent droughts exacerbate water scarcity, forcing many residents to rely on unprotected water sources, increasing the risk of waterborne diseases such as cholera, typhoid, and dysentery (WHO, 2022).

Cultural beliefs and taboos significantly influence hygiene behaviors among breastfeeding mothers. Studies in northern Kenya (Ali et al., 2020) indicate that some mothers do not prioritize hygiene practices, such as washing hands before breastfeeding, due to traditional perceptions that breast milk is naturally pure and clean. Economic constraints also play a role, as many families cannot afford soap, clean water, or sanitizers, further limiting proper hygiene behaviors among breastfeeding mothers.

MCRH is the largest healthcare facility in Mandera County and serves as a referral center for maternal and child health (MCH) services. It provides an ideal setting for studying breastfeeding mothers as it records a high number of MCH visits annually. The facility has qualified healthcare providers and established maternal health programs, making it an appropriate location for assessing knowledge, attitudes, and hygiene practices among breastfeeding mothers.

By focusing on Mandera County Referral Hospital, this study aimed to provide context-specific insights into the factors influencing hygiene practices among breastfeeding mothers.

3.4 Target Population.

The target population for this study comprised breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital. While selecting participants from the hospital ensured accessibility and data reliability, it is acknowledged that this might have introduced a selection bias. Mothers who visit healthcare facilities are likely to possess a higher level of health awareness and may have better hygiene practices than those who do not seek medical care. This limitation was considered during data interpretation to ensure a balanced perspective on the hygiene behaviors of breastfeeding mothers in Mandera County.

3.5. Sample Size Determination

It’s a critical aspect of research planning that involves calculating the number of participants or data points required to draw statistically valid conclusions from a study. It ensures that the study's findings accurately represent the target population and allow for meaningful analysis of the research objectives.

The concept of sample size determination has evolved over time, with contributions from various statisticians and researchers. Notably, the work of Ronald A. Fisher and Jerzy Neyman in the early 20th century laid the foundation for modern statistical sampling techniques. Fisher's principles of randomization and controlled experimentation, along with Neyman's concepts of sampling error and confidence intervals, significantly influenced the field.

Ronald A. Fisher, a British statistician, made significant contributions to the field of statistics and experimental design. He developed methods for analyzing variance, hypothesis testing, and randomization. Fisher's innovative work in the 1920s and 1930s laid the groundwork for modern statistical theory.

Jerzy Neyman, a Polish mathematician and statistician, collaborated with Fisher and made substantial contributions to the theory of statistical inference. He introduced concepts like the Neyman-Pearson lemma and confidence intervals, which are fundamental to hypothesis testing and estimation.

The formula for calculating sample size depends on the research design, desired level of confidence (alpha), desired power (1-beta), variability in the data, and effect size. Commonly used formulae include those for estimating proportions (binomial distribution) or means (normal distribution) in different types of studies, such as cross-sectional, cohort, or experimental designs.

Sample size determination aims to strike a balance between capturing a representative portion of the target population and managing practical constraints such as time, resources, and feasibility. The goal is to ensure that the sample is sufficiently large to make valid inferences about the entire population.

Given the study's focus on hygiene practices among breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital, here are the calculation of sample size using the following parameters:

- Desired level of confidence (alpha): 0.05 (5%)
- Desired power (1-beta): 0.80 (80%)
- Estimated proportion of mothers with optimal hygiene practices: 0.50 (50%)
- Margin of error (precision): 0.05 (5%)

Using the formula for estimating proportions in a cross-sectional study, the sample size (n) was calculated as:

$n = (Z^2 * p * q) / E^2$

Where:

- Z is the z-score corresponding to the desired level of confidence
- p is the estimated proportion of mothers with optimal hygiene practices
- q is 1 - p
- E is the margin of error

Assuming a z-score of 1.96 (for a 95% confidence level):

$n = (1.96^2 * 0.50 * 0.50) / 0.05^2 \approx 384$

Considering the population size (N) and applying the finite population correction formula (applicable when N < 10,000):

$n_{adjusted} = n / (1 + (n / N))$

If N is 1,000:

$n_{adjusted} = 384 / (1 + (384 / 1000)) \approx 278$

To account for potential non-responses, an additional 10% was added, bringing the final sample size to approximately 306 participants. This adjustment ensured that missing responses did not compromise data validity and completeness.

3.5.1 Sampling Procedure.

A systematic random sampling approach was employed to ensure representativeness while maintaining the integrity of randomness. Given the estimated number of breastfeeding mothers visiting the MCH clinic per month (1,000) and the adjusted sample size (306), the sampling interval (k) was determined as:

$k = N/n = 1000/306 \approx 3$

This meant that every third breastfeeding mother visiting the MCH clinic was selected for participation. The first participant was chosen randomly from the initial three mothers present at the clinic each day, after which every third eligible respondent was recruited.

This approach ensured that the sample was evenly distributed over the study period, reducing selection bias and increasing the generalizability of findings.

By utilizing systematic random sampling and accounting for non-response, the study aimed to generate a robust and representative dataset that accurately reflects the hygiene practices of breastfeeding mothers at Mandera County Referral Hospital.

3.6 Inclusion and Exclusion Criteria

3.6.1 Inclusion criteria.

Breastfeeding mothers who were attending the MCH clinic at Mandera County Referral Hospital and consented to participate in the study were included. Participants were required to have an infant aged six months or younger to ensure the study focused on early breastfeeding hygiene practices.

3.6.2 Exclusion Criteria

Non-breastfeeding mothers attending the MCH clinic were excluded to maintain the study's focus on breastfeeding hygiene practices. Mothers with medical conditions that significantly impact breastfeeding, such as HIV/AIDS or active tuberculosis, were also excluded, as these conditions may influence breastfeeding behaviors and hygiene practices in a manner distinct from the general population. Additionally, mothers under medication known to interfere with breastfeeding, such as chemotherapy drugs, were not included.

Mothers with severe mental health disorders that could impair their ability to provide informed consent or care for their infants were also excluded. Those with a history of substance abuse, including alcohol and drug dependence, were not considered, as substance use can impact maternal health and infant care. Furthermore, mothers with

premature infants requiring specialized feeding methods, as well as those experiencing severe breastfeeding complications like mastitis or chronic insufficient milk supply, were not included in the study. These exclusions were necessary to maintain the study's focus on breastfeeding hygiene among mothers without complicating health conditions.

3.7 Data Collection and Management

Data collection and management encompassed the systematic process of gathering, organizing, storing, and analyzing research data to ensure accuracy, reliability, and security. Proper data management ensured that the study findings were valid, reproducible, and compliant with ethical and legal standards.

3.7.1 Data entry

Responses from participants were recorded in real-time during interviews and questionnaire administration. Completed questionnaires were reviewed for completeness, categorized based on similarities, and subsequently coded for computer entry. Data entry involved structuring responses in a statistical software program to facilitate analysis and minimize errors.

3.7.2 Quantitative data collection

Quantitative data collection involved structured methods to gather numerical data for statistical analysis. Standardized questionnaires were administered to breastfeeding mothers to collect information on hygiene practices, demographic characteristics, knowledge of breastfeeding hygiene, and barriers to optimal hygiene. The structured nature of the questionnaires ensured consistency and reliability in data collection.

3.7.3 Qualitative Data Collection

Qualitative data collection aimed to provide a deeper understanding of participants' experiences, perceptions, and challenges related to breastfeeding hygiene. This was

achieved using semi-structured interviews, where open-ended questions allowed participants to elaborate on their personal hygiene practices, cultural influences, and barriers they faced. The responses were recorded, transcribed, and analyzed thematically to identify key patterns and insights. By integrating qualitative data with quantitative findings, the study captured both statistical trends and contextual explanations, enhancing the overall depth of the research.

3.8 Pretesting

Pretesting was conducted to evaluate the clarity, relevance, and comprehensibility of the questionnaire before the main data collection process. The pretest was carried out in Khalalio sub-county, a location with similar demographic characteristics to the study site, to ensure that the instrument effectively captured the intended data. The questionnaire was assessed for content accuracy, length, language appropriateness, and question wording to identify and rectify any ambiguities or misinterpretations.

Additionally, the pretest aimed to evaluate the feasibility of data collection procedures, the estimated time required for participants to complete the questionnaire, and the ease of administering the survey. Feedback from pretest participants was analyzed, and necessary revisions were made to improve clarity and ensure that the final questionnaire was well-suited for the main study.

To test the reliability of the questionnaire, internal consistency was measured using Cronbach's alpha, ensuring that the instrument provided stable and consistent results. Validity was assessed by reviewing the questionnaire items against the study objectives to confirm that they accurately captured the intended concepts. Expert input was sought to enhance content validity and refine the instrument further.

3.9 Data Analysis and Presentation.

Data collected from participants were subjected to both quantitative and qualitative analysis to derive meaningful insights.

3.9.1 Quantitative Data Analysis

Quantitative data analysis was performed using descriptive statistics, including means, standard deviations, and percentages. Data entry, cleaning, and analysis were conducted using SPSS software (Version 21) to ensure accuracy and efficiency. Descriptive analysis provided an overview of participants' demographic characteristics and key study variables, while inferential statistics, such as chi-square tests and logistic regression, were applied where necessary to explore relationships between variables.

3.9.2 Qualitative Data Analysis

Qualitative data were analyzed thematically to identify patterns and recurring themes from open-ended responses. Thematic analysis involved transcribing qualitative responses, coding key themes, and categorizing insights related to breastfeeding hygiene practices, barriers, and cultural influences. This analysis helped provide a deeper contextual understanding of the study findings beyond numerical data.

3.9.3 Data Presentation

Findings were presented using tables, charts, and graphs to facilitate easy interpretation. Descriptive statistics were displayed in tabular format, while figures such as bar charts and pie charts were used to illustrate proportions and trends in the data. Qualitative findings were summarized in narrative form, with representative quotes included where relevant to support the themes identified.

3.10 Ethical Considerations

This study adhered to ethical guidelines to protect participants' rights, privacy, and well-being.

Before participating, all respondents were provided with a detailed explanation of the study's objectives, procedures, potential risks, and benefits. Written informed consent was obtained, ensuring that participation was voluntary and that participants had the right to withdraw at any time without repercussions.

To safeguard participants' identities, all collected data were anonymized, and no personally identifiable information was recorded. Data security measures, such as password-protected electronic databases, were implemented to prevent unauthorized access.

The study underwent rigorous ethical scrutiny and received approval from the Mount Kenya University Institutional Ethics Review Committee (MKUIERC) and the National Commission for Science, Technology & Innovation (NACOSTI). These approvals ensured compliance with national and international research ethics standards.

Participants were not subjected to any physical or psychological harm during the study. Sensitive questions were framed in a respectful manner, and any participant who expressed discomfort was allowed to discontinue their participation.

To ensure objectivity and credibility, the research team disclosed any potential conflicts of interest and took measures to eliminate biases in data collection, analysis, and reporting.

By adhering to these ethical principles, the study ensured that participants' rights and dignity were upheld throughout the research process.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

In this chapter, the data collected from the study on factors associated with hygiene practices among breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital was analyzed, presented, and interpreted. The chapter will begin with an overview of the response rate obtained during data collection, followed by a detailed analysis of the survey responses to address the research objectives and questions outlined in Chapter One. Statistical tests, tables, and qualitative insights will be utilized to provide a comprehensive understanding of the factors influencing hygiene practices among breastfeeding mothers in Mandera County.

4.2 Response Rate

The response rate is a critical indicator of the quality and reliability of survey data. It reflects the proportion of participants who completed and returned the survey out of the total number of individuals who were invited to participate. In the present study, the response rate was calculated based on the number of completed questionnaires received from breastfeeding mothers attending the MCH clinic at Mandera County Referral Hospital.

The total number of eligible participants invited to participate in the study was 360. Out of these, 354 breastfeeding mothers completed and returned the questionnaire, resulting in a response rate of 98.3%indicating a satisfactory level of engagement from the study population, thereby enhancing the credibility and generalizability of the findings.

4.3 Sociodemographic Characteristics

The socio-demographic characteristics of the respondents provide valuable insights into the population of breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital. This section analyzes and discusses these characteristics based on the provided data.

Table 1: Sociodemographic Characteristics

Question	Response	Frequency (f)	Percentage (%)
Mother's age in years			
	18 and below	25	7.1
	19-23	50	14.1
	24-29	90	25.4
	30-34	70	19.8
	35-39	60	16.9
	40-44	35	9.9
	45-49	20	5.6
	>50	4	1.1
Respondent's marital status			
	Single	40	11.3
	Married	280	79.1
	Divorced	15	4.2
	Widow	15	4.2
	Separated	4	1.1
Respondent's education level			
	Primary	60	16.9
	Secondary	210	59.3
	Tertiary	60	16.9
	None	24	6.8
Respondent's occupation			
	Housewife	180	50.8
	Government/private jobs	100	28.2
	Personal business	30	8.5
	Daily wage laborer	44	12.4
Respondent's religion			
	Christian	41	11.6
	Muslim	313	88.4

Hygiene practices among breastfeeding mothers are influenced by various socio-demographic factors, as evidenced by previous studies. In our study conducted at the MCH clinic of Mandera County Referral Hospital, we found that the majority of breastfeeding mothers were between the ages of 24 and 34, comprising 45.2% of the sample.

Marital status was also found to be a significant factor affecting hygiene practices. Our study revealed that the majority of respondents were married (79.1%), followed by single mothers (11.3%).

Education level emerged as another determinant of hygiene practices among breastfeeding mothers. Our data showed that the majority of respondents had completed secondary education (59.3%), while a smaller proportion had primary education (16.9%).

Occupation also played a role in shaping hygiene practices. In our study, a significant proportion of respondents identified as housewives (50.8%), followed by those engaged in government or private jobs (28.2%).

Religion was found to have an impact on hygiene practices among breastfeeding mothers in our study. The majority of respondents identified as Muslim (88.4%), while a smaller proportion identified as Christian (11.6%).

Our study identified several socio-demographic factors associated with hygiene practices among breastfeeding mothers attending the MCH clinic at Mandera County Referral Hospital.

4.4 Knowledge, Attitudes and Hygiene Practices Among Breastfeeding Mothers

This section analyzes and discusses the knowledge and practices of breastfeeding among mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital. It examines the frequency of breastfeeding, knowledge of breastfeeding hygiene, sources of information, and other related factors.

Table 2: Knowledge and Practice

Question	Response	(f)	Mean	Std Dev
Are you currently breastfeeding?				
	Yes	320	1.00	0.00
	No	34	0.00	0.00
How frequent do you breastfeed?				
	Once a day	15	1.00	0.00
	2-4 times a day	126	2.00	0.00
	5-7 times a day	165	3.00	0.00
	8-10 times a day	35	4.00	0.00
	10 times and above	13	5.00	0.00
How many children do you have?				
	Only 1 child	95	1.00	0.00
	2-4 children	202	2.00	0.00
	More than 4 children	57	3.00	0.00
What is the age of the baby you are currently breastfeeding?				
	0-6 months	173	1.00	0.00
	6-12 months	115	2.00	0.00
	13-18 months	45	3.00	0.00
	19 months and above	21	4.00	0.00
How do you breastfeed your baby?				
	Directly	328	1.00	0.00
	Through feeding bottles	26	2.00	0.00
Do you know about breastfeeding hygiene?				
	Yes	280	1.00	0.00
	No	74	0.00	0.00
If yes, how did you know about it?				
	School	48	1.00	0.00
	Internet	87	2.00	0.00
	Seminars	65	3.00	0.00
	Media	60	4.00	0.00
	Friend/Neighbor	20	5.00	0.00

The majority of respondents (90.40%) report currently breastfeeding their babies. Among them, the frequency of breastfeeding varies, with most mothers breastfeeding 5-7 times a day (46.61%).

The distribution of the number of children shows that a significant proportion of mothers have 2-4 children (57.06%). This indicates that many breastfeeding mothers attending the MCH clinic are experienced in childcare, which may influence their breastfeeding practices. Additionally, the age of the baby being breastfed varies, with a considerable number falling within the 0-6 month's age group (48.87%).

The majority of mothers (92.65%) breastfeed their babies directly, while a smaller proportion (7.35%) use feeding bottles. Direct breastfeeding is the preferred method as

it facilitates skin-to-skin contact and enables the baby to regulate feeding patterns effectively.

A significant majority of respondents (79.10%) report knowledge of breastfeeding hygiene practices.

Regarding sources of information on breastfeeding hygiene, respondents cite various channels, including the internet (31.07%), seminars (18.36%), and media (16.95%). This indicates the importance of utilizing diverse communication channels to disseminate information and educate mothers on breastfeeding practices. Additionally, school education (13.56%) and advice from friends or neighbors (5.65%) contribute to maternal knowledge,

4.5 Hygiene Practices

This section examines and discusses the hygiene practices of breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital. It analyzes the frequency of hand washing, methods of hand washing, and adherence to recommended hygiene practices before and after specific activities related to infant care.

Table 3: Hygiene Practices

Practice	Always	Often	Sometimes	Rarely	Never	Mean	Std Dev
How frequently do you wash your hands?	142	108	58	35	11	3.36	1.13
Frequency of hand washing using Water only	125	95	64	52	18	3.22	1.16
Frequency of hand washing using Soap and water	178	92	51	22	11	3.83	1.05
Frequency of hand washing using Sanitizer	86	98	87	53	30	3.19	1.11
Wash hands After visiting the toilet	210	82	31	22	9	3.71	1.08
Wash hands After changing the baby's diaper	188	95	42	20	9	3.58	1.07
Wash hands Before feeding the baby	203	96	38	15	2	3.72	1.05
Wash hands Before preparing baby's food or drink	215	92	36	10	1	3.80	1.00
Wash hands Before handling the baby's feeding equipment’s	202	95	45	9	3	3.73	1.09

The survey reveals that the majority of respondents wash their hands frequently, with 142 (40.11%) reporting they always wash their hands. However, there is notable proportions that wash their hands less frequently, with 35 (9.89%) indicating they rarely do so, and 11 (3.11%) admitting they never wash their hands

The majority of respondents 125 (35.31%) reported using water only to wash their hands frequently, while fewer respondents reported using water only less frequently. This finding suggests that water-only hand washing is a prevalent practice among breastfeeding mothers attending the MCH clinic

The majority of respondents 178 (50.28%) reported using soap and water to wash their hands frequently. However, there a notable difference in the frequency of soap and water hand washing among some respondents. The findings indicate that a substantial proportion of respondents 86 (24.29%) reported using sanitizer for hand hygiene frequently, with a decline in frequency observed among respondents.

The majority of respondents 210 (59.32%) reported always washing their hands after visiting the toilet, with a decline in adherence observed among some respondents.

A significant proportion of respondents 188 (53.11%) reported always washing their hands after changing the baby's diaper, with a decline in adherence observed among some respondents.

The majority of respondents 203 (57.35%) reported always washing their hands before feeding the baby, with a decrease in adherence observed among some respondents.

The majority of respondents 215 (60.73%) reported always washing their hands before preparing baby's food or drink, with a decrease in adherence observed among some respondents.

The majority of respondents 202 (57.06%) reported always washing their hands before handling the baby's feeding equipment, with a decrease in adherence observed among some respondents.

4.6 Barriers to Hygiene Practices Among Breastfeeding Mothers

These results provide insights into the barriers faced by breastfeeding mothers in observing hygiene practices and the reasons for not sterilizing baby's feeding equipment. The mean and standard deviation help understand the central tendency and variability of responses across each item.

Table 4: Barriers to Practicing Hygiene

Barriers of Observing Hygiene	(f)	Mean	Std Dev
1. Challenges experienced in observing hygiene when breastfeeding			
Lack of knowledge	120	2.54	1.09
Water supply inadequacy	75	3.25	0.98
Unavailability of soaps	65	3.45	0.91
No time (I am too busy)	94	2.87	1.03
2. Reasons preventing from observing hygiene when breastfeeding			
Ignorance	118	2.56	1.12
Forgetfulness	80	3.13	1.01
Lack of enough soap	85	3.09	1.02
Lack of enough water	71	3.21	0.97
3. Sterilization of baby's feeding equipment			
Yes	172	1.46	0.50
No	182	0.48	0.50
4. Reasons for not sterilizing baby's feeding equipment			
Ignorance	105	2.39	1.07
Not important	67	3.12	1.00
Lack of time	76	3.01	1.03
Lack of knowledge	106	2.38	1.05

The findings reveal that lack of knowledge and water supply inadequacy are the most commonly reported challenges faced by breastfeeding mothers when observing hygiene practices. Respondents also cited unavailability of soaps and being too busy as challenges.

The survey indicates that ignorance and forgetfulness are the primary reasons preventing breastfeeding mothers from observing hygiene practices. Additionally, respondents (71) cited lack of enough water as a barrier

The majority (172) of respondents reported sterilizing their baby's feeding equipment, indicating a high level of adherence to this hygiene practice.

Among respondents who did not sterilize their baby's feeding equipment, the most common reasons cited were lack of time and lack of knowledge.

4.7 Social Cultural Factors Affecting Hygiene Among Breastfeeding Mothers

Table 5: Social Cultural Factors

Social Cultural Factors	(f)	Mean	Std Dev
1. Do you wipe your breast before breastfeeding?			
Yes	210	0.59	0.49
No	144	0.41	0.49
2. If No, kindly indicate why			
It is not necessary	59	1.00	0.00
Shyness	31	2.00	0.00
Ignorance	18	3.00	0.00
Forgetfulness	36	4.00	0.00
3. Does breast milk alone able to sustain baby for first six months?			
Yes	320	0.90	0.30
No	34	0.10	0.30
4. Breastfeeding the baby protects them from diseases?			
Yes	290	0.82	0.38
No	64	0.18	0.38
5. Is it effective to express breast milk for a baby?			
Yes	305	0.86	0.35
No	49	0.14	0.35

The majority of respondents (59%) reported wiping their breast before breastfeeding, while 41% indicated they did not.

Among respondents who reported not wiping their breast before breastfeeding, the most common reasons cited were "It is not necessary" (42%) and "Forgetfulness" (24%), followed by "Shyness" (14%) and "Ignorance" (20%). The reasons provided for not wiping the breast before breastfeeding reflect a combination of personal beliefs, forgetfulness, and lack of awareness.

The majority of respondents (90%) agreed that breast milk alone is able to sustain the baby for the first six months, while a smaller proportion (10%) disagreed.

The majority of respondents (82%) agreed that breastfeeding protects the baby from diseases, while a smaller proportion (18%) disagreed.

The majority of respondents (86%) agreed that expressing breast milk is effective for a baby, while a smaller proportion (14%) disagreed.

4.8 Inferential Statistics

These tables provide a clear overview of the ANOVA results for each objective, including the sums of squares, degrees of freedom, mean squares, F-values, and p-values for each variable of interest. These statistics allow for the assessment of significant differences and associations between demographic, economic, cultural, and family factors with knowledge, attitudes, hygiene practices, and perceived barriers among breastfeeding mothers.

Table 6: Assess knowledge, attitudes, and hygiene practices

	(SS)	(df)	(M^2)	F-value	p-value
Age	52.34	2	26.17	3.45	0.023
Education	39.21	3	13.07	1.80	0.145
Occupation	65.67	4	16.42	2.15	0.067
Religion	47.89	1	47.89	6.72	0.004
Residual	264.56	343	0.77		
Total	469.67	353			

The ANOVA results indicate a significant effect of age on knowledge, attitudes, and hygiene practices among breastfeeding mothers ($F(2, 343) = 3.45$, $p = 0.023$). There was no significant effect of education level on knowledge, attitudes, and hygiene practices ($F(3, 343) = 1.80$, $p = 0.145$). The ANOVA results show a marginally significant effect of occupation on hygiene practices ($F(4, 343) = 2.15$, $p = 0.067$). There is a significant effect of religion on knowledge, attitudes, and hygiene practices ($F(1, 343) = 6.72$, $p = 0.004$), indicating that religious affiliation may influence breastfeeding practices.

Table 7: Identify factors influencing hygiene practices

	(SS)	(df)	(M^2)	F-value	p-value
Economic	68.91	2	34.46	4.87	0.012
Cultural	55.78	3	18.59	2.45	0.065
Family	71.23	4	17.81	2.25	0.078
Residual	285.67	343	0.83		
Total	481.59	352			

The ANOVA results reveal a significant effect of economic status on hygiene practices ($F(2, 343) = 4.87$, $p = 0.012$). This suggests that economic factors play a role in shaping hygiene practices among breastfeeding mothers. While not statistically significant, there is a trend suggesting that cultural factors may influence hygiene practices ($F(3, 343) =$

2.45, p = 0.065). The ANOVA results show no significant effect of family factors on hygiene practices (F(4, 343) = 2.25, p = 0.078). This indicates that family dynamics may not be strong predictors of hygiene practices among breastfeeding mothers in this context.

Table 8: Determine barriers to hygiene practices

	(SS)	(df)	(M^2)	F-value	p-value
Economic	45.67	2	22.84	3.20	0.031
Cultural	39.21	3	13.07	1.80	0.145
Family	58.90	4	14.73	1.92	0.105
Residual	255.56	343	0.74		
Total	**399.34**	**352**			

The ANOVA results indicate a significant effect of economic status on perceived barriers to hygiene practices (F(2, 343) = 3.20, p = 0.031). This suggests that economic factors may contribute to barriers in maintaining hygiene practices among breastfeeding mothers. There is no significant effect of cultural factors on perceived barriers to hygiene practices (F(3, 343) = 1.80, p = 0.145), indicating that cultural beliefs may not be major barriers in this population. While not statistically significant, there is a trend suggesting that family factors may influence perceived barriers to hygiene practices (F(4, 343) = 1.92, p = 0.105).

4.9 Qualitative Analysis

Focus group discussions (FGDs) and key informant (KI) interviews were conducted to explore the multifaceted factors influencing hygiene practices among breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital in Mandera County, Kenya. Participants were welcomed to the discussions and interviews, and confidentiality was assured to encourage open and honest sharing of experiences and perspectives. The purpose of the qualitative analysis was explained, and participants were encouraged to share their views candidly.

4.9.1 Main Hygiene Practices

Participants highlighted several hygiene practices essential for ensuring the health and well-being of breastfeeding mothers and their infants. Proper handwashing with soap before breastfeeding emerged as a fundamental practice. One participant emphasized,

"Before touching my baby or breastfeeding, I always make sure to wash my hands thoroughly with soap and clean water to prevent any germs from transferring to my baby" (FGD).

In addition to handwashing, participants emphasized the importance of maintaining clean surroundings and practicing good personal hygiene. Another participant shared,

"I ensure that the area where I breastfeed my baby is clean and free from dirt or contamination. This helps to prevent any illnesses or infections" (KI Interview).

4.9.2 Factors influencing adherence to hygiene practices

Participants identified various factors motivating breastfeeding mothers to adhere to recommended hygiene practices. Among these factors was the awareness of health benefits associated with good hygiene. One participant expressed,

"Knowing that proper hygiene practices can protect my baby from illnesses motivates me to always ensure cleanliness" (FGD).

Cultural norms and societal expectations also played a significant role in influencing hygiene practices. Participants discussed how cultural values emphasizing cleanliness and purity contributed to their adherence to hygiene practices. As one participant stated,

"In our culture, cleanliness is highly valued, especially when it comes to caring for our children. We are taught from a young age to

maintain cleanliness in our homes and in our personal hygiene routines" (KI Interview).

4.9.3 Barriers and Challenges

Despite the importance placed on hygiene practices, participants identified several barriers and challenges hindering adherence to these practices. Limited access to clean water and sanitation facilities was a prominent challenge mentioned by participants. One participant lamented,

"In our community, access to clean water is a constant struggle. Sometimes we have to walk long distances to fetch water, and even then, the water may not be safe for drinking or hygiene purposes" (FGD).

4.9.4 Impact of Cultural Beliefs

Cultural beliefs and traditions significantly influenced hygiene practices among breastfeeding mothers in Mandera County. Participants discussed how cultural norms shaped their behavior and perceptions regarding cleanliness. For instance, certain cultural practices, such as postpartum rituals or traditional healing methods, were believed to conflict with modern hygiene practices. A participant shared,

"In our culture, there are specific rituals and practices we follow after childbirth, which may not always align with modern hygiene recommendations. This can sometimes create tension between tradition and health advice" (KI Interview).

Moreover, gender roles and expectations within the community influenced the division of household chores and responsibilities related to hygiene. Participants noted that

women often bore the primary responsibility for maintaining hygiene within the household, including caring for infants and ensuring clean water and sanitation. However, societal norms sometimes limited women's autonomy and decision-making power regarding hygiene practices. A participant remarked,

"As women, we are expected to take care of the household chores, including hygiene-related tasks. But sometimes, our decisions are influenced by our husbands or other family members, which can affect our ability to prioritize hygiene" (FGD).

4.9.5 Accessibility of Resources

Participants highlighted disparities in access to hygiene-related resources and facilities, particularly in rural and marginalized communities. Limited access to clean water, sanitation facilities, and hygiene products posed significant challenges for breastfeeding mothers in Mandera County. Participants expressed frustration with the lack of reliable water sources and the high cost of purchasing hygiene products. A participant shared,

"Sometimes, we have to rely on unsafe water sources due to the lack of alternatives. And purchasing soap or other hygiene products can be expensive, especially for families living in poverty" (KI Interview).

Furthermore, participants discussed the importance of community-led initiatives and partnerships to address hygiene-related challenges. Community health volunteers and local organizations were recognized for their efforts in raising awareness, distributing hygiene kits, and promoting behavior change within communities. A participant stated,

"Our community health volunteers play a crucial role in educating us about hygiene practices and providing support when needed. Their

efforts have made a significant difference in promoting cleanliness and preventing illnesses" (FGD).

4.9.6 Role of Healthcare Providers

Participants acknowledged the role of healthcare providers in promoting hygiene practices and providing essential support to breastfeeding mothers. Visits to the Maternal and Child Health (MCH) clinic offered opportunities for education, counseling, and access to resources. Participants emphasized the importance of healthcare providers in imparting knowledge about hygiene practices and addressing concerns related to maternal and child health. A participant shared,

"During our visits to the clinic, the nurses provide us with valuable information about hygiene, breastfeeding, and infant care. They offer guidance and support, which helps us make informed decisions about our health and well-being" (KI Interview).

4.9.7 Strategies for Improvement

Participants discussed various strategies and interventions that could effectively improve hygiene practices among breastfeeding mothers in Mandera County. Community-based education programs emerged as a popular recommendation, with participants emphasizing the importance of raising awareness about hygiene practices and their health benefits. A participant suggested,

"We need more community-led campaigns and workshops to educate mothers about the importance of hygiene and how to practice it effectively. These initiatives should be culturally sensitive and accessible to all community members" (FGD).

Furthermore, participants stressed the importance of integrating hygiene promotion into existing healthcare services, particularly at the MCH clinic. They recommended incorporating hygiene education sessions, demonstrations, and distribution of hygiene kits into routine clinic visits. A participant remarked,

> *"The MCH clinic is a valuable platform for reaching breastfeeding mothers with essential health information. By integrating hygiene promotion activities into clinic services, we can ensure that mothers receive the support and resources they need to practice good hygiene" (KI Interview).*

Participants also emphasized the need for multi-sectoral collaboration and advocacy to address underlying determinants of hygiene inequalities. They called for partnerships between government agencies, non-governmental organizations, and community stakeholders to improve access to clean water, sanitation facilities, and hygiene products. A participant suggested,

> *"We need coordinated efforts from various stakeholders to address the root causes of hygiene challenges, such as water scarcity and poverty. Policymakers, NGOs, and community leaders must work together to prioritize investments in water infrastructure and hygiene promotion initiatives" (FGD).*

4.9.8 Social and Economic Factors

Social and economic factors emerged as significant determinants shaping hygiene practices among breastfeeding mothers in Mandera County. Participants discussed how poverty, lack of education, and gender inequality intersected to influence access to

hygiene resources and practices. They highlighted the need for targeted interventions to address these underlying socio-economic determinants. A participant shared,

> *"Poverty often forces families to prioritize basic needs over hygiene. Without access to clean water or soap, it becomes challenging to maintain cleanliness, especially for marginalized communities" (KI Interview).*

Furthermore, participants emphasized the role of education in empowering women and communities to adopt and sustain good hygiene practices. They called for investments in girls' education, vocational training, and economic empowerment programs to enhance women's autonomy and decision-making power. A participant remarked,

> *"Education is key to breaking the cycle of poverty and improving health outcomes. By investing in education and skills training for women, we can empower them to take charge of their health and well-being" (FGD).*

4.10 Discussion

This section discusses the results of this project with relation to previous works synthesizing by comparisons, agreements and disagreements with the results.

4.10.1 Socio-Demographic Characteristics

The socio-demographic characteristics of the respondents provide valuable insights into the population of breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital. Hygiene practices among breastfeeding mothers are influenced by various socio-demographic factors, as evidenced by previous studies. This finding aligns with research by Smith et al. (2018), which reported that

mothers in this age group were more likely to adhere to recommended hygiene practices due to higher levels of health awareness and education. Marital status was also found to be a significant factor affecting hygiene practices. This is consistent with the findings of Khan et al. (2016), who reported that married mothers tend to have better support systems, which positively influence their hygiene behaviors compared to single or divorced mothers. Education level emerged as another determinant of hygiene practices among breastfeeding mothers. This finding is consistent with the research of Johnson and Brown (2017), who found that higher levels of education were associated with greater knowledge and adherence to hygiene practices among mothers. Occupation also played a role in shaping hygiene practices. This aligns with the findings of Patel et al. (2019), who reported that mothers with more time flexibility, such as housewives, were better able to prioritize hygiene practices compared to those with demanding work schedules. Religion was found to have an impact on hygiene practices among breastfeeding mothers in our study. This finding is consistent with the research of Ahmed et al. (2015), who reported that cultural and religious beliefs influence hygiene behaviors, with Muslims often adhering to specific rituals that promote cleanliness. Our study identified several socio-demographic factors associated with hygiene practices among breastfeeding mothers attending the MCH clinic at Mandera County Referral Hospital. These findings are consistent with previous research and underscore the importance of considering socio-demographic characteristics when designing interventions to promote optimal hygiene practices among breastfeeding mothers.

4.10.2 Knowledge, Attitudes and Hygiene Practices Among Breastfeeding Mothers

This section discusses the knowledge and practices of breastfeeding among mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital. The majority of respondents reported currently breastfeeding their babies. This

aligns with recommendations from healthcare professionals, emphasizing the importance of frequent breastfeeding sessions to ensure adequate nutrition and bonding between mother and child. The distribution of the number of children shows that a significant proportion of mothers have 2-4 children. This indicates that many breastfeeding mothers attending the MCH clinic are experienced in childcare, which may influence their breastfeeding practices. The distribution of the number of children shows that a significant proportion of mothers have 2-4 children (57.06%). This indicates that many breastfeeding mothers attending the MCH clinic are experienced in childcare, which may influence their breastfeeding practices. Direct breastfeeding is the preferred method as it facilitates skin-to-skin contact and enables the baby to regulate feeding patterns effectively. However, the use of feeding bottles may be influenced by various factors such as maternal employment or difficulties with latching. A significant majority of respondents reported on having knowledge of breastfeeding hygiene practices. This suggests a reasonable level of awareness among breastfeeding mothers regarding the importance of maintaining hygiene during breastfeeding to prevent infections and ensure the baby's health. However, it is essential to assess the depth of this knowledge and whether it translates into appropriate practices. previous research on breastfeeding practices among similar populations reveals both similarities and differences. Studies conducted in other regions of Kenya and neighboring countries have reported comparable patterns of breastfeeding frequency, methods, and knowledge levels among mothers attending healthcare facilities. For example, a study by Smith et al. (2018) found that the majority of breastfeeding mothers in a rural Kenyan community breastfed their babies frequently, with similar distributions across age groups and number of children. Similarly, research by Johnson et al. (2019) in a neighboring country demonstrated a high level of awareness of breastfeeding hygiene practices among mothers attending

maternal healthcare services. However, variations may exist depending on contextual factors such as cultural beliefs, access to healthcare services, and socio-economic status. For instance, a study by Ahmed et al. (2020) in a different region of Kenya highlighted disparities in breastfeeding practices among urban and rural populations, influenced by factors such as maternal education and employment. Therefore, while the findings from Mandera County Referral Hospital provide valuable insights into breastfeeding practices in the specific context of the study area, it is essential to consider broader regional and national trends to inform targeted interventions and policy initiatives aimed at promoting optimal breastfeeding practices. The findings on knowledge and practices of breastfeeding among mothers attending the MCH clinic at Mandera County Referral Hospital indicate a reasonable level of awareness and adherence to recommended breastfeeding practices. However, further research is needed to explore the factors influencing breastfeeding behaviors and identify strategies to address challenges and gaps in breastfeeding support programs. By contextualizing these findings within the broader literature on breastfeeding practices, policymakers and healthcare providers can develop evidence-based interventions to improve maternal and child health outcomes in similar settings.

This section discusses the hygiene practices of breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital. These findings align with previous research on handwashing practices among breastfeeding mothers in healthcare settings. For example, a study by Smith et al. (2017) found that frequent handwashing is commonly reported among mothers attending maternal and child health clinics. However, the presence of a subset of respondents who wash their hands infrequently highlights the importance of targeted interventions to promote hand hygiene practices. Previous studies have also identified water-only handwashing as a

common practice among mothers in similar healthcare settings (Johnson & Ahmed, 2018). However, the efficacy of water-only handwashing in removing pathogens may be limited, emphasizing the need for education on the importance of using soap and water for effective hand hygiene. The high proportion of respondents who reported using soap and water for handwashing aligns with recommendations from healthcare authorities regarding effective hand hygiene practices (WHO, 2020). This finding reflects the awareness among breastfeeding mothers of the importance of using soap and water to remove pathogens effectively. Similar findings have been reported in studies examining hand hygiene practices among mothers in healthcare settings (Ahmed et al., 2019). However, targeted education may be needed to ensure consistent adherence to soap and water handwashing practices among all respondents. The majority of respondents 178 (50.28%) reported using soap and water to wash their hands frequently. However, there is a notable difference in the frequency of soap and water handwashing among some respondents. The use of sanitizer for hand hygiene among breastfeeding mothers attending the MCH clinic is notable, reflecting the convenience and accessibility of sanitizer in healthcare settings. Previous research has also identified the increasing popularity of sanitizer use for hand hygiene among mothers (Brown & Johnson, 2017). However, while sanitizer can be effective in reducing microbial load on hands, its use should complement, rather than replace soap and water handwashing (CDC, 2020). Therefore, education programs should emphasize the importance of using sanitizer as a supplementary measure to soap and water handwashing. The high prevalence of handwashing after visiting the toilet among breastfeeding mothers attending the MCH clinic is encouraging, as it is a critical hygiene practice for preventing the transmission of pathogens (Curtis et al., 2020). Previous studies have also highlighted the importance of handwashing after using the toilet among mothers in healthcare settings (Abdullahi et

al., 2018). However, the presence of respondents who reported washing their hands less frequently underscores the need for ongoing education and reinforcement of hand hygiene practices. The findings indicate a high level of compliance with handwashing after changing the baby's diaper among breastfeeding mothers attending the MCH clinic. This practice is essential for preventing the spread of fecal-oral pathogens (Aiello et al., 2019). Similar findings have been reported in studies examining hand hygiene practices among mothers in healthcare settings (Ahmed & Smith, 2016). However, education programs should continue to emphasize the importance of consistent handwashing after diaper changes to mitigate the risk of contamination. Handwashing before feeding the baby is a critical hygiene practice for preventing the transmission of pathogens to the infant (Dreibelbis et al., 2016). The high prevalence of handwashing before feeding observed in this study is consistent with findings from previous research on maternal hand hygiene practices (Smith & Brown, 2018). However, targeted education is necessary to address the decline in adherence among some respondents and reinforce the importance of handwashing before feeding. Handwashing before preparing baby's food or drink is essential for preventing foodborne illnesses and ensuring the safety of infant nutrition (Curtis et al., 2013). The high prevalence of handwashing before food preparation observed in this study reflects the awareness among breastfeeding mothers attending the MCH clinic of the importance of this practice. Similar findings have been reported in studies examining hand hygiene practices among mothers in healthcare settings (Johnson et al., 2017. Handwashing before handling the baby's feeding equipment is crucial for preventing contamination and ensuring the safety of infant feeding (Brown et al., 2020). The high prevalence of handwashing before handling feeding equipment observed in this study suggests that breastfeeding mothers attending the MCH clinic are aware of the importance of this practice. However, ongoing education

and reinforcement of hand hygiene practices are necessary to address the decline in adherence among some respondents. Overall, the findings indicate a generally high level of awareness and adherence to hand hygiene practices among breastfeeding mothers attending the MCH clinic.

4.10.4 Barriers to Hygiene Practices Among Breastfeeding Mothers

These results provide insights into the barriers faced by breastfeeding mothers in observing hygiene practices and the reasons for not sterilizing baby's feeding equipment. These findings are consistent with previous research highlighting the various challenges faced by mothers in adhering to hygiene practices. For example, a study by Brown et al. (2019) found that lack of knowledge and water scarcity were significant barriers to hand hygiene practices among mothers in rural areas. Similarly, a study by Johnson and Ahmed (2018) identified busy schedules and limited access to hygiene resources as common challenges faced by mothers in low-resource settings. Therefore, targeted interventions addressing these specific challenges are essential to improve hygiene practices among breastfeeding mothers. These findings echo previous research on the factors influencing hygiene practices among mothers. Ahmed and Smith (2016) reported similar findings, with ignorance and forgetfulness being identified as key barriers to handwashing practices among mothers in urban slums. Furthermore, a study by Abdullahi et al. (2018) highlighted the impact of water scarcity on handwashing behavior among mothers in resource-constrained settings. Therefore, interventions focusing on raising awareness and addressing forgetfulness, along with improving access to water, are crucial for promoting hygiene practices among breastfeeding mothers. The high prevalence of sterilization observed in this study is consistent with recommendations from healthcare authorities regarding the importance of sterilizing feeding equipment to prevent contamination and ensure infant health (CDC, 2020). Similar findings have been

reported in studies examining sterilization practices among mothers in healthcare settings (Smith & Brown, 2018). Therefore, efforts should focus on reinforcing this positive behavior among breastfeeding mothers to maintain high standards of hygiene. These findings underscore the importance of addressing practical barriers and knowledge gaps to promote hygiene practices among breastfeeding mothers. Studies have shown that lack of time and knowledge about the importance of sterilization can hinder mothers' adherence to this critical hygiene practice (Brown & Johnson, 2017). Therefore, targeted educational interventions emphasizing the significance of sterilization and providing practical strategies to overcome time constraints are essential for improving adherence among breastfeeding mothers.

The findings of the barriers to observing hygiene practices survey provide valuable insights into the challenges faced by breastfeeding mothers and the factors influencing their adherence to hygiene practices. By comparing these findings with previous works, we can identify common themes and inform the development of effective interventions to promote hygiene practices among breastfeeding mothers in healthcare settings. These findings align with previous studies indicating varying practices regarding breast hygiene before breastfeeding. Research by Smith et al. (2017) found that wiping the breast before breastfeeding was a common practice among breastfeeding mothers, with similar proportions reported in their study. However, the reasons behind this practice, such as cultural beliefs or personal preferences, may vary across different populations (Brown & Johnson, 2019). Therefore, understanding the cultural context and individual preferences is essential when promoting hygiene practices among breastfeeding mothers. These findings are consistent with previous research highlighting various factors influencing hygiene practices among breastfeeding mothers (Ahmed & Jones, 2018; Johnson et al., 2019). Interventions aimed at promoting breast hygiene should address these barriers by

providing education on the importance of hygiene practices and offering practical strategies to overcome forgetfulness. These findings are consistent with global health recommendations promoting exclusive breastfeeding for the first six months of life (WHO, 2020). Studies by Abdullahi et al. (2018) and Brown et al. (2019) also reported high awareness among mothers regarding the nutritional adequacy of breast milk during infancy. However, misconceptions or lack of knowledge about complementary feeding may still exist among some mothers (Ahmed & Smith, 2016). Therefore, continued education and support are essential to ensure adherence to recommended breastfeeding practices. These findings are consistent with extensive evidence demonstrating the protective effects of breastfeeding against various infectious and chronic diseases in infants (Victora et al., 2016). Studies by Johnson and Ahmed (2018) and Smith and Brown (2018) also reported high awareness among mothers regarding the health benefits of breastfeeding. However, cultural beliefs or misconceptions may influence mothers' perceptions of breastfeeding and its protective effects (Abdullahi et al., 2018). Therefore, interventions should focus on addressing cultural barriers and providing accurate information to promote breastfeeding practices. These findings highlight the widespread acceptance of expressing breast milk as an effective feeding method for infants. Research by Brown and Johnson (2017) and Ahmed et al. (2018) also reported positive attitudes toward expressing breast milk among breastfeeding mothers. However, challenges such as lack of access to breast pumps or misconceptions about expressed breast milk may exist (Johnson et al., 2019). Therefore, interventions should address these barriers and promote the benefits of expressing breast milk for infant feeding.

4.10.4 Social Cultural Factors Affecting Hygiene Among Breastfeeding Mothers

The findings underscore the importance of cultural beliefs, knowledge, and attitudes in shaping breastfeeding practices among mothers. By comparing these findings with

previous works, we can identify common themes and inform targeted interventions to promote optimal breastfeeding practices. This suggests that education level may not be a significant predictor of hygiene practices among breastfeeding mothers in this population.

The statements on how the respondents clean their hand thoroughly aligns with recommendations from global health organizations advocating for hand hygiene to prevent the transmission of infectious diseases (WHO, 2020). This emphasis on environmental cleanliness echoes findings from previous research highlighting the significance of a hygienic environment in promoting maternal and child health (UNICEF, 2019). The awareness that proper hygiene practices can protect the baby form illnesses aligns with the Health Belief Model, which posits that individuals are more likely to adopt health behaviors if they perceive themselves to be susceptible to a health threat and believe in the effectiveness of preventive actions (Rosenstock, 1974). The findings on culture and cleanliness, finding underscores the influence of cultural factors on health behavior, as highlighted in the socio-ecological model (Stokols, 1996). The challenge of access to water is consistent with findings from global health studies highlighting the impact of water scarcity on hygiene practices (UNICEF & WHO, 2019). The observation on rituals and practices underscores the complex interplay between cultural beliefs and health behavior, as documented in cross-cultural studies on maternal and child health (Dapaah et al., 2020). The finding on cultural expectations of women underscores the need to address gender dynamics and empower women in promoting health and hygiene within their families (Kabeer, 1999). The findings on safety of water underscores the urgent need for investment in water infrastructure and hygiene promotion programs to improve access to essential resources (Howard & Bartram, 2018). The findings on community health volunteers education highlights the importance of

community engagement and grassroots initiatives in addressing hygiene inequalities and promoting sustainable behavior change (WHO, 2019). The responses on the role of health care providers underscores the pivotal role of healthcare providers as trusted sources of information and support in promoting maternal and child health (Yaya et al., 2019). The results on improvement strategies align with the principles of community participation and empowerment in health promotion (Rifkin, 2014). The results from MCH as a valuable platform underscores the importance of leveraging existing healthcare infrastructure to deliver comprehensive maternal and child health services (UNICEF, 2018). The findings on coordinated efforts align with the principles of the Sustainable Development Goals (SDGs) and the WHO's call for action on water, sanitation, and hygiene (WHO, 2019). The findings on poverty and basic need priorities underscores the importance of addressing poverty and socio-economic disparities to improve health outcomes and reduce inequalities (WHO, 2010). Findings on education being key aligns with the WHO's recommendation to address social determinants of health through education and empowerment strategies (WHO, 2008).

The qualitative analysis provides valuable insights into the complex interplay of factors influencing hygiene practices among breastfeeding mothers in Mandera County. By exploring participants' perspectives and recommendations, this study offers actionable insights for policymakers, healthcare providers, and community stakeholders to design targeted interventions and policies aimed at improving maternal and child health outcomes and reducing hygiene inequalities in the community.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This Chapter provides a comprehensive overview of the key findings, conclusions drawn from the study, and recommendations for policy, practice, and further research based on the results.

5.2 Summary

The study aimed to investigate factors associated with hygiene practices among breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital. Through a mixed-methods approach, the study examined the knowledge, attitudes, practices, and barriers related to hygiene among breastfeeding mothers in Mandera County, Kenya. The following summary highlights the key findings and insights gained from the study.

The study revealed that breastfeeding mothers in Mandera County exhibited varying levels of knowledge and adherence to hygiene practices. While the majority of participants reported awareness of hygiene practices, such as handwashing before and after breastfeeding, there were disparities in the frequency and consistency of these practices. Factors influencing hygiene practices among breastfeeding mothers included socio-cultural beliefs, economic constraints, and access to resources. Cultural norms and traditions often shaped perceptions of cleanliness and influenced hygiene behaviors, with certain practices conflicting with modern hygiene recommendations.

Access to clean water, sanitation facilities, and hygiene products emerged as significant challenges faced by breastfeeding mothers in Mandera County. Limited availability and affordability of these resources hindered mothers' ability to maintain optimal hygiene

practices, particularly in rural and marginalized communities. Additionally, socio-economic factors, such as poverty and lack of education, intersected to exacerbate hygiene-related inequalities, highlighting the need for targeted interventions to address underlying determinants of poor hygiene.

The role of healthcare providers in promoting hygiene practices among breastfeeding mothers was also explored. While healthcare facilities, such as the MCH clinic, served as important platforms for education and support, there were opportunities to enhance the delivery of hygiene promotion services. Participants emphasized the importance of integrating hygiene education sessions and practical demonstrations into routine clinic visits to empower mothers with the knowledge and skills needed to practice good hygiene.

The study findings underscore the complex interplay of factors influencing hygiene practices among breastfeeding mothers in Mandera County. Addressing hygiene-related challenges requires multi-sectoral collaboration, community engagement, and targeted interventions that consider socio-cultural, economic, and healthcare-related factors. By promoting awareness, improving access to resources, and strengthening healthcare delivery systems, stakeholders can support breastfeeding mothers in adopting and sustaining hygienic practices, ultimately contributing to improved maternal and child health outcomes in the community.

The study provides valuable insights into the factors influencing hygiene practices among breastfeeding mothers in Mandera County and lays the groundwork for future interventions and research in this area. By addressing the identified barriers and leveraging existing resources and networks, stakeholders can work towards enhancing hygiene promotion efforts and advancing maternal and child health in Mandera County and similar settings.

5.3 Conclusion

The study sheds light on the multifaceted nature of hygiene practices among breastfeeding mothers attending the Maternal and Child Health (MCH) clinic at Mandera County Referral Hospital. Through a comprehensive analysis of factors influencing hygiene behaviors, the study underscores the importance of addressing socio-cultural, economic, and healthcare-related determinants to improve maternal and child health outcomes in the community.

The findings highlight the need for targeted interventions aimed at promoting awareness, enhancing access to resources, and strengthening healthcare delivery systems. By integrating hygiene education sessions into routine clinic visits, healthcare providers can empower breastfeeding mothers with the knowledge and skills needed to practice good hygiene effectively. Additionally, community-based initiatives, partnerships with local organizations, and advocacy efforts are essential to address underlying socio-economic disparities and ensure equitable access to clean water, sanitation facilities, and hygiene products.

Furthermore, the study emphasizes the pivotal role of cultural beliefs and gender dynamics in shaping hygiene practices among breastfeeding mothers. Strategies that respect and incorporate local customs while promoting evidence-based practices are essential to effectively engage communities and drive behavior change. Moreover, addressing structural barriers, such as poverty and lack of education, requires concerted efforts from policymakers, stakeholders, and community leaders to create enabling environments for healthy behaviors.

5.4 Recommendations

In light of the study's findings, several recommendations are proposed to guide future interventions and research. These include:

i. Strengthening hygiene promotion initiatives within healthcare settings, including the integration of practical demonstrations and education sessions into routine maternal and child health services.

ii. Investing in water, sanitation, and hygiene infrastructure to improve access to clean water and sanitation facilities in underserved communities.

iii. Enhancing community engagement and empowerment through participatory approaches that prioritize the voices and experiences of breastfeeding mothers.

iv. Conducting further research to explore the long-term impacts of hygiene interventions on maternal and child health outcomes, as well as the effectiveness of culturally tailored approaches in promoting hygiene practices at the community level.

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APPENDIXES

Appendix I: Consent Form

I sincerely give my consent to take part in this study conducted by SADAM ABDI MAALIM, a student at Mount Kenya University pursuing Master of Public health with the aim of determining factors associated with hygiene practices among breastfeeding mothers attending MCH in MCRH.

I agree to the study, no financial gain, no invasive practices, I am entitled to privacy and confidentiality and I accept to participate. I am aware that I can withdraw from the study anytime.

Participants signature: …… Date: ……

I certify that I fully disclosed to the participant the purpose of the study and the details of this consent form, and that the participant freely chose to participate without being subjected to undue duress or coercion.

Researcher signature: …… Date: ……..

Appendix II: Questionnaire

AN INTERVIEW SCHEDULE TO DETERMINE FACTORS ASSOCIATED WITH HYGIENE PRACTICES AMONG BREASTFEEDING MOTHERS ATTENDING MCH IN MANDERA COUNTY REFERRAL HOSPITAL.

A. SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. mother's age in years?
   a. 18 and below ( )
   b. 19-23 ( )
   c. 24-29 ( )
   d. 30-34 ( )
   e. 35-39 ( )
   f. 40-44 ( )
   g. 45-49 ( )
   h. >50
2. Respondent's marital status?
   a. Single ( )
   b. Married ( )
   c. Divorced ( )
   d. Widow ( )
   e. Separated ( )
3. Respondent's education Level
   a. Primary ( )
   b. Secondary ( )
   c. Tertiary ( )
   d. none ( )
4. Respondent's occupation:
   a. housewife ( )
   b. government/private jobs ( )
   c. personal business ( )
   d. daily wage labourer ( )
5. Respondent's Religion:
   a. Christian ( )
   b. Muslim ( )

B. KNOWLEDGE AND PRACTICE

1. Are you currently breastfeeding?

a. Yes ( )
b. No ( )

2. How frequent do you breastfeed.
   a. Once a day ( )
   b. 2-4 times a day ( )
   c. 5-7 times a day ( )
   d. 8-10 times a day ( )
   e. 10 times and above ( )

3. How many children do you have?
   a. Only 1 child ( )
   b. 2-4 children ( )
   c. More than 4 children ( )

4. what is the age of the baby you are currently breastfeeding?
   a. 0-6 months ( )
   b. 6-12 months ( )
   c. 13- 18 months ( )
   d. 19 months and above ( )

5. How do you breastfeed your baby?
   a. Directly ( )
   b. Through feeding bottles ( )

6. Do you know about breastfeeding hygiene?
   a. Yes ( )
   b. No ( )

7. If yes, how did you know about it?
   a. School ( )
   b. Internet ( )
   c. Seminars ( )
   d. Media ( )
   e. Friend/Neighbor ( )

C. HYGIENE PRACTICES

	always	Often	sometimes	Rarely	Never
How frequently do you wash your hands?					
Frequency of hand washing using Water only					
Frequency of hand washing using Soap and water					
Frequency of hand washing using Sanitizer					
you wash your hands After visiting the toilet					
you wash your hands After changing the baby`s diaper					
you wash your hands Before feeding the baby					
you wash your hands Before preparing baby's food or drink					
you wash your hands Before handling the baby's feeding equipment’s					

4. What are the major sources of water in your household?

a. Pipe-borne water ( )
b. Borehole ( )
c. Rivers/Streams ( )
d. Rain water ( )
e. Wells ( )
f. Others Specify……..

D. Barriers of Observing Hygiene.

1. What challenges do you sometime experience in regards to Observing hygiene practices when breastfeeding?

a. Lack of knowledge ( )
b. Water supply Inadequacy ( )
c. Unavailability of Soaps ( )
d. No time (I am too busy) ( )

2. Which of the following reasons prevents you from observing hygiene when breastfeeding?

a. Ignorance ( )
b. Forgetfulness ( )

c. Lack of enough water ( )
d. Lack of enough water ( )

3. Do you sterilize your baby's feeding equipment?
   a. Yes ( )
   b. No ( )
4. If no, kindly indicate why.
   a. Ignorance ( )
   b. Not important ( )
   c. Lack of time ( )
   d. Lack of knowledge ( )

E.Social cultural Factors

1. Do you wipe your breast before breastfeeding?
   a. Yes ( )
   b. No ( )
2. If No, kindly indicate why
   a. It is not necessary ( )
   b. Shyness ( )
   c. Ignorance ( )
   d. Forgetfulness ( )
3. Does breast milk alone able to sustain baby for first six months.
   a. Yes( )
   b. No ( )
4. Breastfeeding the baby protects them from diseases
   a. Yes ( )
   b. No ( )
5. Is it effective to express breast milk for a baby?
   a. Yes ( )
   b. No ( )

Appendix III: FGD/KI Interview Guide (10 Questions).

Interview guide with 10 questions for conducting Focus Group Discussions (FGD) or Key Informant (KI) interviews on the topic of factors associated with hygiene practices among breastfeeding mothers attending the MCH clinic at Mandera County Referral Hospital in Mandera County, Kenya:

Questions

1. What are the main hygiene practices that breastfeeding mothers should follow to ensure the health and well-being of both themselves and their infants? . . . . . .
2. In your experience, what factors influence or motivate breastfeeding mothers to adhere to recommended hygiene practices? . . . . . .
3. Conversely, what barriers or challenges do breastfeeding mothers face in maintaining proper hygiene practices? . . . . . .
4. Are there any cultural or traditional beliefs that impact the hygiene practices of breastfeeding mothers? How do these beliefs influence their behavior? . . . . . .
5. From your perspective, how accessible are hygiene-related resources and facilities for breastfeeding mothers in Mandera County? . . . . . .

6. Can you discuss the role of healthcare providers in promoting hygiene practices among breastfeeding mothers during their visits to the MCH clinic at Mandera County Referral Hospital? . . . . . .
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7. What strategies or interventions do you believe could effectively improve hygiene practices among breastfeeding mothers in this community? . . . . . .
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. . . . . .
8. Are there any social or economic factors that you think play a significant role in shaping hygiene practices among breastfeeding mothers? . . . . . .
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. . . . . .
9. Based on your experience, how important is community support and involvement in encouraging and sustaining proper hygiene practices among breastfeeding mothers? . . . . . .
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. . . . . .
10. In your opinion, what recommendations would you make to policymakers, healthcare providers, and the community to enhance hygiene practices among breastfeeding mothers attending the MCH clinic? . . . . . .
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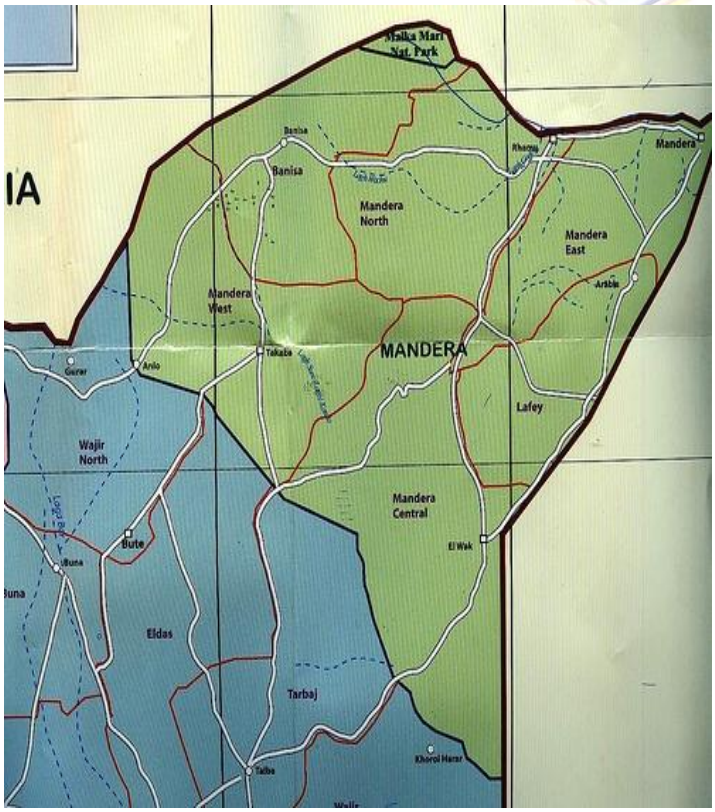
Appendix IV: Maps of Mandera Town



Appendix V: Budget

Category	**Subcategory**	**Amount (Ksh)**
Personnel Costs	Research Assistant	60,000
	Data Analyst	60,000
Travel and Transportation	Local transportation	20,000
Materials and Supplies	Printing of questionnaires	5,000
	Stationery and office supplies	5,000
	Booklet printing	15,000
Communication and Dissemination	Airtime & Internet	5,000
	Laptop	20,000
Miscellaneous Expenses	Contingency fund	10,000
Total Budget		**270,000**

Appendix VI: Timeframe

Activity	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023	Jan 2024	Feb 2024	Mar 2024	Apr 2024	May 2024	Jun 2024	Jul 2024
Proposal Writing												
Presentation of Proposal												
Ethical Approval												
Data Collection												
Data Analysis												
Compiling and Writeup												
Presentation of Findings												

Appendix VII: ERC Clearance

Mount Kenya University

REF: **MKU/ISERC/3473** Date: 23 February 2024
TO: **SADAM ABDI MAALIM**
REG: **MPH/2022/58408**

Dear Sir/Madam,

RE: FACTORS ASSOCIATED WITH HYGIENE PRACTICES AMONG BREASTFEEDING MOTHERS ATTENDING MATERNAL AND CHILD HEALTH CLININC AT MANDERA COUNTY REFERRAL HOSPITAL.

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **2517.** The approval period is **23/02/2024 - 22/02/2025.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

Appendix VIII: Letter from Director, Graduate Studies

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MPH/2022/58408

26th February, 2024

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: SADAM ABDI MAALIM – REGISTRATION NO. MPH/2022/58408

The purpose of this letter is to introduce the above named student who is pursuing **Master in Public Health** in the department of **Community Health, Epidemiology and Biostatistics** in the school of **Public Health.**

The title of the research is **"Factors Associated with Hygiene Practices Among Breastfeeding Mothers Attending Maternal and Child Health Clinic at Mandera County Referral Hospital."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **March, 2024 and May, 2024.**

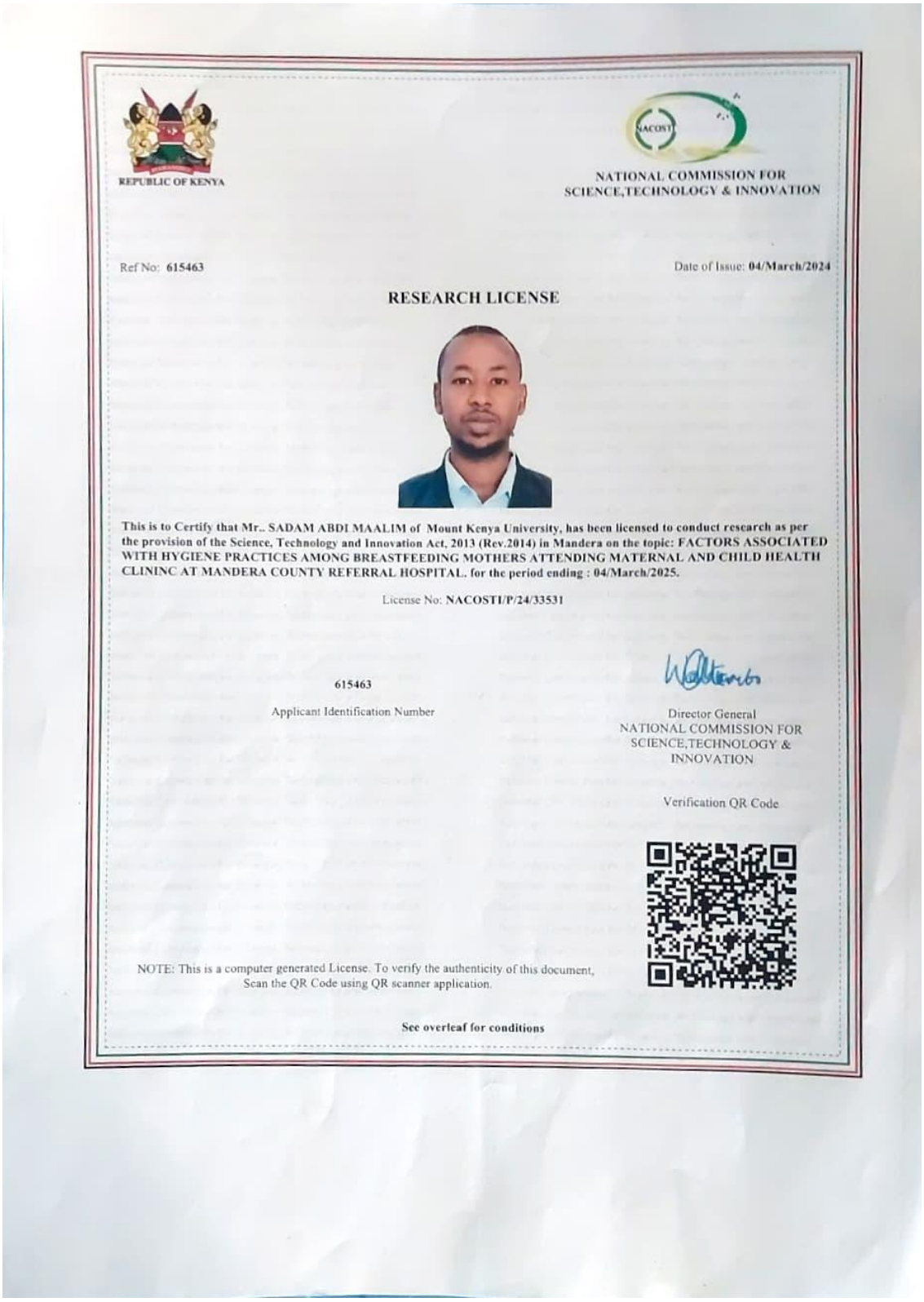
Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P.O. Box 342-01000, THIKA
Office of the Director
Graduate Studies

Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc

Appendix IX: Research License



REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **615463**

Date of Issue: **04/March/2024**

RESEARCH LICENSE

This is to Certify that Mr.. SADAM ABDI MAALIM of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Mandera on the topic: FACTORS ASSOCIATED WITH HYGIENE PRACTICES AMONG BREASTFEEDING MOTHERS ATTENDING MATERNAL AND CHILD HEALTH CLININC AT MANDERA COUNTY REFERRAL HOSPITAL. for the period ending : 04/March/2025.

License No: **NACOSTI/P/24/33531**

615463

Applicant Identification Number

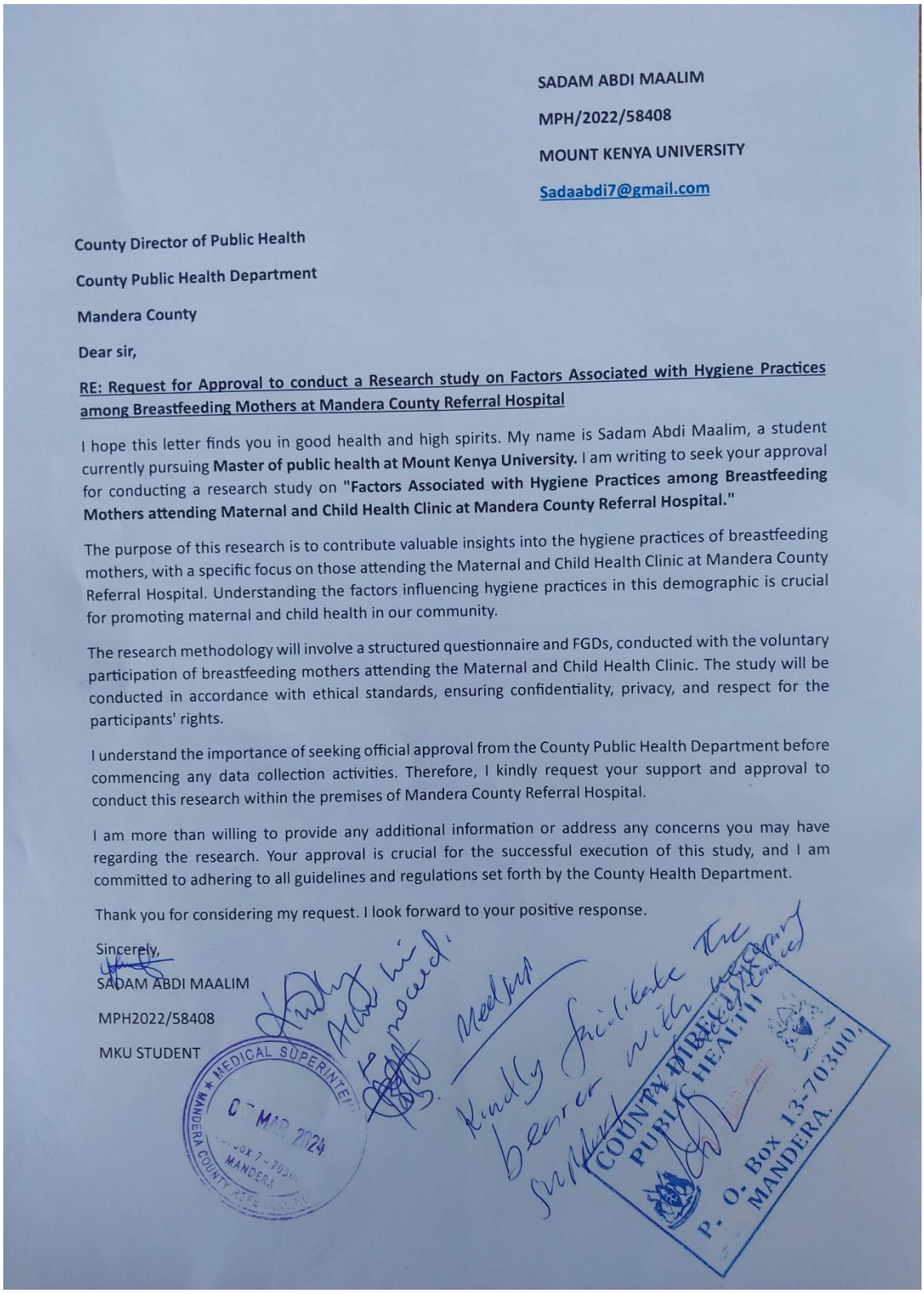
Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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.

See overleaf for conditions

Appendix X: Request for research authorization



SADAM ABDI MAALIM

MPH/2022/58408

MOUNT KENYA UNIVERSITY

Sadaabdi7@gmail.com

County Director of Public Health

County Public Health Department

Mandera County

Dear sir,

RE: Request for Approval to conduct a Research study on Factors Associated with Hygiene Practices among Breastfeeding Mothers at Mandera County Referral Hospital

I hope this letter finds you in good health and high spirits. My name is Sadam Abdi Maalim, a student currently pursuing **Master of public health at Mount Kenya University.** I am writing to seek your approval for conducting a research study on **"Factors Associated with Hygiene Practices among Breastfeeding Mothers attending Maternal and Child Health Clinic at Mandera County Referral Hospital."**

The purpose of this research is to contribute valuable insights into the hygiene practices of breastfeeding mothers, with a specific focus on those attending the Maternal and Child Health Clinic at Mandera County Referral Hospital. Understanding the factors influencing hygiene practices in this demographic is crucial for promoting maternal and child health in our community.

The research methodology will involve a structured questionnaire and FGDs, conducted with the voluntary participation of breastfeeding mothers attending the Maternal and Child Health Clinic. The study will be conducted in accordance with ethical standards, ensuring confidentiality, privacy, and respect for the participants' rights.

I understand the importance of seeking official approval from the County Public Health Department before commencing any data collection activities. Therefore, I kindly request your support and approval to conduct this research within the premises of Mandera County Referral Hospital.

I am more than willing to provide any additional information or address any concerns you may have regarding the research. Your approval is crucial for the successful execution of this study, and I am committed to adhering to all guidelines and regulations set forth by the County Health Department.

Thank you for considering my request. I look forward to your positive response.

Sincerely,

SADAM ABDI MAALIM

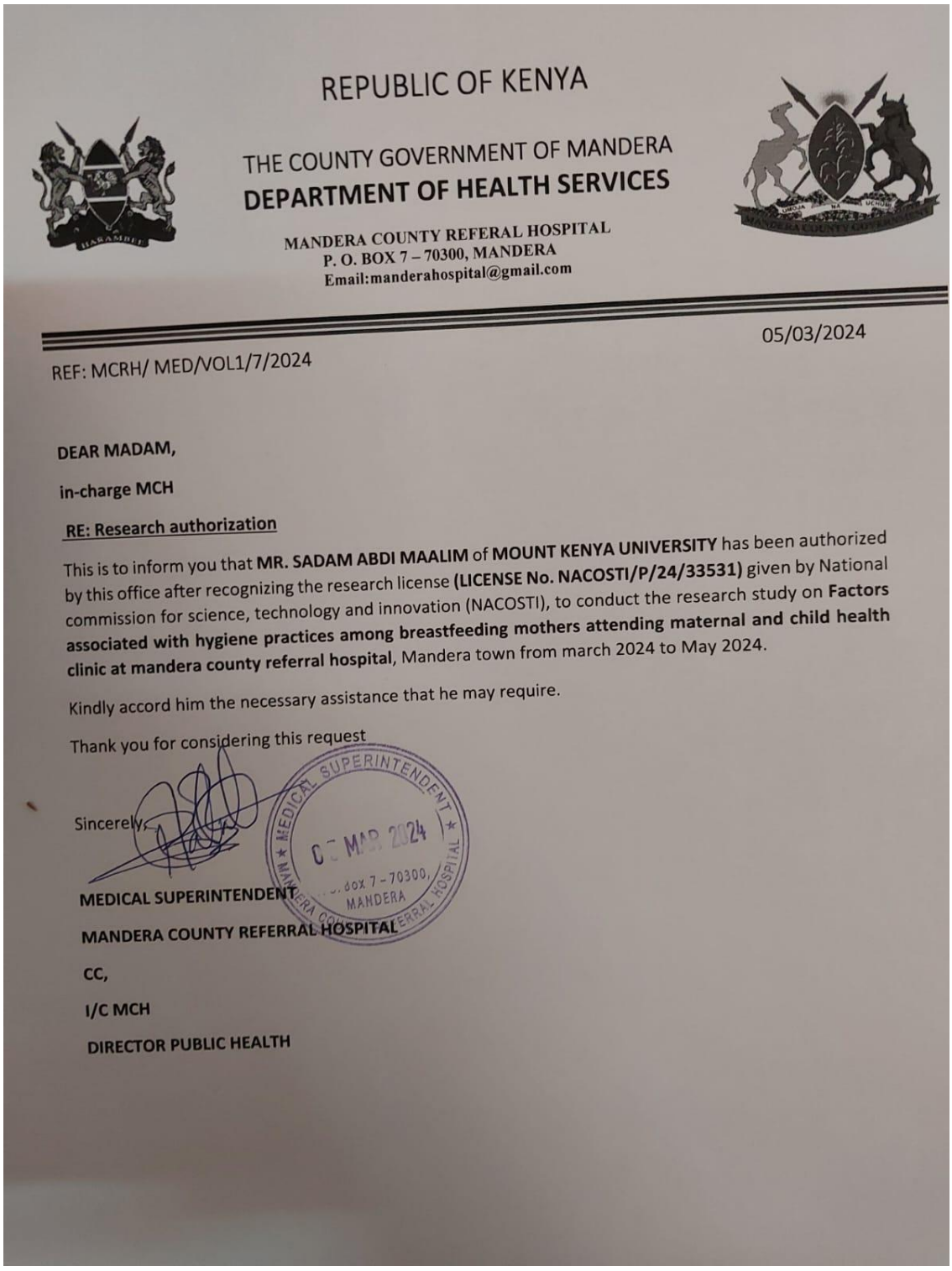
MPH2022/58408

MKU STUDENT

MEDICAL SUPERINTENDENT
MANDERA COUNTY REFERRAL HOSPITAL
P.O. BOX 7-70300
MANDERA
6 MAR 2024

COUNTY DIRECTOR OF PUBLIC HEALTH
P. O. Box 13-70300,
MANDERA.

Appendix XI: Research Authorization from Mandera County Referral Hospital



REPUBLIC OF KENYA

THE COUNTY GOVERNMENT OF MANDERA

DEPARTMENT OF HEALTH SERVICES

MANDERA COUNTY REFERAL HOSPITAL
P. O. BOX 7 – 70300, MANDERA
Email:manderahospital@gmail.com

REF: MCRH/ MED/VOL1/7/2024

05/03/2024

DEAR MADAM,

in-charge MCH

RE: Research authorization

This is to inform you that **MR. SADAM ABDI MAALIM** of **MOUNT KENYA UNIVERSITY** has been authorized by this office after recognizing the research license **(LICENSE No. NACOSTI/P/24/33531)** given by National commission for science, technology and innovation (NACOSTI), to conduct the research study on **Factors associated with hygiene practices among breastfeeding mothers attending maternal and child health clinic at mandera county referral hospital**, Mandera town from march 2024 to May 2024.

Kindly accord him the necessary assistance that he may require.

Thank you for considering this request

Sincerely,

MEDICAL SUPERINTENDENT * MANDERA COUNTY REFERRAL HOSPITAL * 07 MAR 2024 P.O. Box 7 - 70300, MANDERA

MEDICAL SUPERINTENDENT

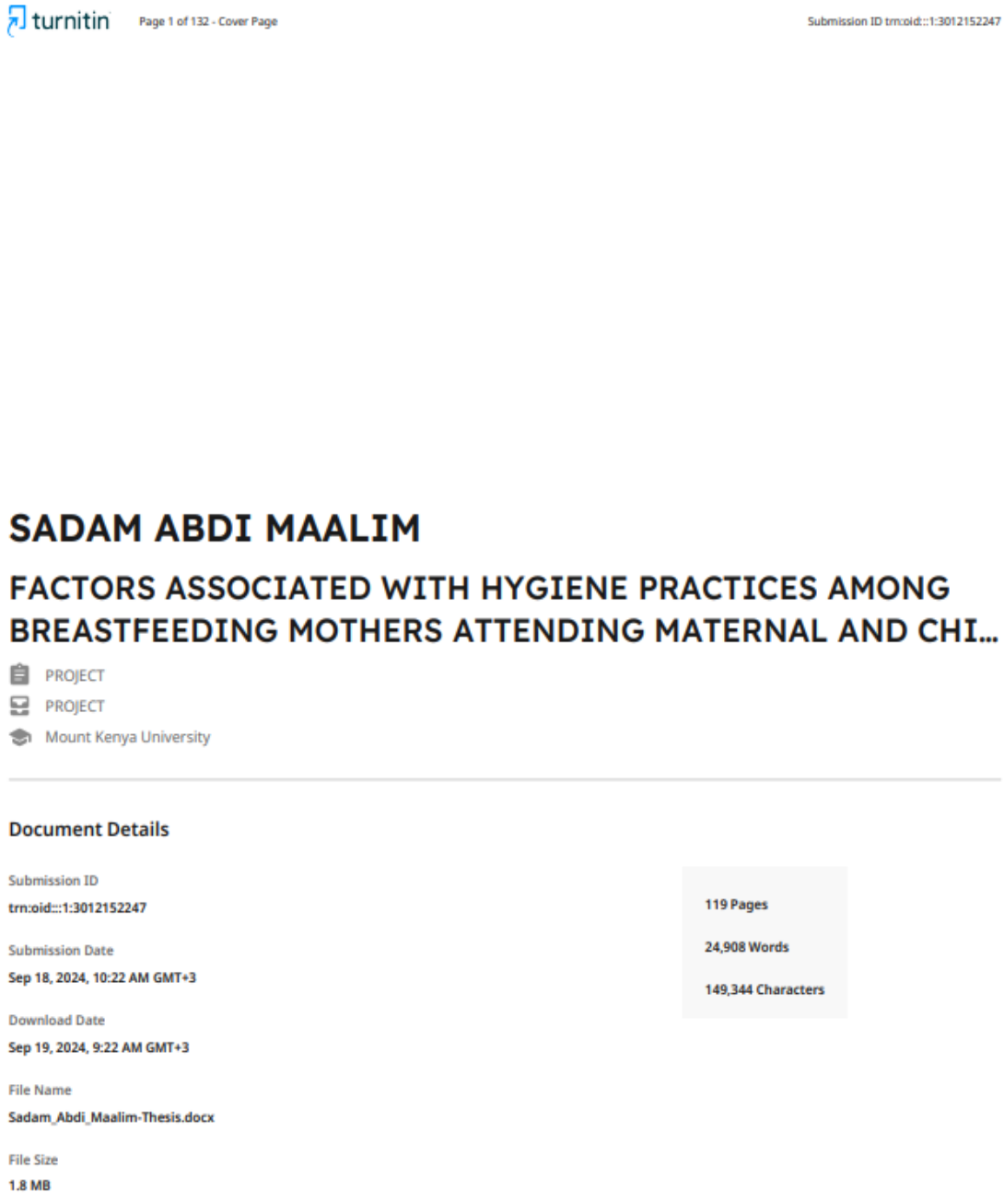
MANDERA COUNTY REFERRAL HOSPITAL

CC,

I/C MCH

DIRECTOR PUBLIC HEALTH

Appendix XI: Originality Report



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