



Malnutrition Among Children Under Five Years in Kismayo General Hospital

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DECLARATION

I, **Ibrahim Ali Mahat** hereby declare that this thesis entitled “**Malnutrition Among Children Under Five Years in Kismayo General Hospital**” is my original work and has not been submitted, in whole or in part, to any other university or institution for the award of any degree or academic qualification.

I further declare that all sources of information used in this research have been duly acknowledged through proper citations and references in accordance with academic standards.

This research is submitted to the **faculty of Health Science Metropolitan University of Somalia**, in partial fulfillment of the requirements for the award of a degree of **Bachelor in nutrition**

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APPROVAL SHEET

This research thesis entitled “**Malnutrition among children under five years in Kismayo General Hospital**” submitted by Ibrahim Ali Mahat in partial fulfillment of the requirements for the award of a degree of bachelor in nutrition has been examined and approved for its acceptance and fulfillment of the requirements for the degree

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Date: _____

DEDICATION

This research work is dedicated to my beloved Children Aisha, Abdullah and Aliya, whose constant love, encouragement, and prayers have been my greatest source of strength and motivation throughout my academic journey.

Special appreciation goes to my parents, who instilled in me the value of education and perseverance, and to my siblings and friends, who supported me through every stage of this study with patience and understanding.

I also dedicate this work to all the caregivers and children under five years in Somalia, whose struggles and resilience inspired this research. May this study serve as a contribution toward improving their health and well-being.

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LIST OF ABBREVIATIONS

CMAM	Community-Based Management of Acute Malnutrition
UNICEF	United Nations International Children’s Emergency Fund
WFP	World Food Program
WHO	World Health Organization
FAO	Food and Agriculture Organization
NGO	Non-Governmental Organization
MOH	Ministry of Health
RUTF	Ready-to-Use Therapeutic Food
SAM	Severe Acute Malnutrition
MAM	Moderate Acute Malnutrition
SDG	Sustainable Development Goal
SPSS	Statistical Package for the Social Sciences
UNDP	United Nations Development Program
IMAM	Integrated Management of Acute Malnutrition
HIV	Human Immunodeficiency Virus

ABSTRACT

Malnutrition among children under five years continues to be one of the most pressing public health issues in developing countries, particularly in Somalia, where recurrent droughts, food insecurity, and limited access to healthcare services have worsened nutritional outcomes. The purpose of this study was to assess the prevalence, underlying causes, and effects of malnutrition among children under five years attending Kismayo General Hospital. The study aimed to identify the major contributing factors to child malnutrition, examine the impact on health and development, and propose effective intervention strategies that can be implemented by health authorities and humanitarian agencies.

A descriptive research design was adopted to provide an in-depth understanding of the problem. Both qualitative and quantitative methods were employed to ensure a comprehensive analysis. The target population consisted of 50 caregivers of children under five years and healthcare workers directly involved in child nutrition and treatment. Using Slovin's formula with a 5% margin of error, a sample size of 44 participants was determined, out of which 32 respondents (73%) participated successfully, while 12 (27%) declined to respond. Data were collected using structured questionnaires containing both open- and closed-ended questions, as well as key informant interviews with medical professionals. The collected data were analyzed using descriptive statistics such as frequency tables, percentages, and graphical presentations for clarity and interpretation.

The findings revealed that frequent childhood illnesses such as diarrhea, pneumonia, malaria, and measles significantly contribute to malnutrition among children. These infections not only weaken the immune system but also reduce the child's ability to absorb nutrients effectively. Socio-economic factors, including poverty, unemployment, and limited access to clean water and healthcare, were also found to play a central role in worsening malnutrition. Furthermore, maternal education emerged as a key determinant, where mothers with little or no formal education exhibited poor knowledge of breastfeeding and complementary feeding practices. As a result, inappropriate feeding, delayed initiation of breastfeeding, and the early introduction of non-nutritious foods were identified as common practices that increase the risk of malnutrition.

The study also found that malnutrition leads to both short- and long-term consequences. Short-term effects include increased vulnerability to diseases and higher child mortality rates, while long-term effects include stunted physical and cognitive development, low academic performance, and reduced productivity in adulthood. Despite the existence of interventions such as the Community-Based Management of Acute Malnutrition (CMAM), supplementary feeding programs, and nutrition education initiatives by UNICEF and the World Food Programme (WFP), the implementation and coverage of these programs remain inadequate due to resource constraints and poor community awareness.

The study concludes that addressing malnutrition requires a multifaceted approach that combines medical, social, and educational strategies. Strengthening maternal health education, promoting exclusive breastfeeding for the first six months, and expanding community nutrition programs are critical steps toward reducing malnutrition rates. Moreover, collaboration between government agencies, humanitarian organizations, and local communities is essential to ensure the sustainability of nutrition programs. The research recommends further studies to explore long-term strategies for improving household food security and enhancing healthcare access for vulnerable populations in Kismayo and other parts of Somalia.

TABLE OF CONTENTS

DECLARATION	4431
APPROVAL SHEET	4432
DEDICATION	4433
ACKNOWLEDGEMENT	4434
LIST OF ABBREVIATIONS	4435
ABSTRACT	4436
CHAPTER ONE INTRODUCTION	4439
➤ Background of the Study	4439
➤ Statement of the Problem	4439
➤ Research Objectives	4439
• General Objective	4439
• Specific Objectives	4440
➤ Research Questions.....	4440
➤ Significance of the Study	4440
➤ Scope of the Study	4440
• Content of the study	4440
• Geographical Study.....	4440
➤ Operational Definition of Terms.....	4440
➤ Conceptual Framework	4441
CHAPTER TWO LITERATURE REVIEW	4442
➤ Introduction	4442
➤ Global Burden and Trends.....	4442
➤ Forms, Determinants, and Pathways	4442
➤ Regional Perspective: Sub-Saharan Africa.....	4442
➤ Malnutrition in Somalia	4442
➤ Current Interventions in Somalia	4442
➤ Causes and Risk Factors of Malnutrition	4443
• Inadequate Dietary Intake	4443
• Infections and Diseases	4443
• Socio-Economic Factors	4443
• Maternal Education and Feeding Practices.....	4443
➤ Consequences of Malnutrition	4444
➤ Malnutrition Interventions.....	4444
CHAPTER THREE RESEARCH METHODOLOGY	4445
➤ Research Design	4445
➤ Overview of the Research Method.....	4445
➤ Study Area	4445
➤ Target Population.....	4445
➤ Sample Size	4446
$n = N1 + Ne2$	4446
➤ Sampling Procedure.....	4446
➤ Research Instruments	4446
• Validity of Research Instruments.....	4446
• Reliability of Research Instruments	4446
➤ Data Collection Methods.....	4447
➤ Data Collection Procedure.....	4447
➤ Data Analysis.....	4447
➤ Data Sources.....	4447
➤ Ethical Considerations	4447
➤ Limitations of the Methodology	4447
CHAPTER FOUR DATA ANALYSIS AND INTERPRETATION.....	4448
Table 1Demographic Characteristics of Respondents	4448
Table 2 Gender Distribution of Respondents	4448
Table 3 Education Level of Respondents	4448
Table 4 Exclusive Breastfeeding for Six Months.....	4449
Table 5 Number of Meals per Day	4449
Table 6 Common Illnesses Reported in the Last 3 Months.....	4450
Table 7 Growth Monitoring Attendance	4450

CHAPTER FIVE SUMMARY OF KEY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS	4451
➤ Summary of Key Findings.....	4451
➤ Conclusions	4451
➤ Implications of the Study	4451
➤ Recommendations.....	4452
Questionnaire.....	4455
Section A: Demographic Information	4455
Section B: Causes of Malnutrition	4456
Section C: Consequences of Malnutrition	4456
Section D: Interventions and Possible Solutions.....	4457
Section E: Researcher’s Notes (For Analysis)	4457
Ethical Statement.....	4457

CHAPTER ONE INTRODUCTION

➤ *Background of the Study*

Malnutrition remains a significant global public health challenge, particularly among children under the age of five. It is a condition that occurs when the body does not receive adequate nutrients, leading to under-nutrition, stunting, wasting, or micronutrient deficiencies (World Health Organization 2023). Malnutrition is both a cause and a consequence of poor health, poverty, and limited access to adequate food and healthcare services, especially in developing countries (UNICEF, 2021).

Globally, malnutrition contributes to nearly half of all deaths among children under five, resulting in approximately 2.7 million deaths annually (Black et al., 2013). The effects of malnutrition are not only immediate but also long-term, as it impairs cognitive development, weakens the immune system, and increases the risk of infections and chronic diseases later in life (Bhutta et al., 2020). According to the Global Nutrition Report (2022), 149 million children under five were stunted, and 45 million were wasted, with the highest burden found in low-income countries, particularly in Sub-Saharan Africa and South Asia.

The causes of malnutrition are multifaceted and interconnected. **Poverty** is one of the primary drivers, as families living in low-income settings often struggle to access nutrient-rich foods and healthcare services (FAO, 2021). Additionally, poor maternal nutrition during pregnancy and sub-optimal infant and young child feeding practices, such as non-exclusive breastfeeding and early introduction of inappropriate foods, significantly increase malnutrition risks (UNICEF, 2020; Kramer & Kakuma, 2012). Environmental factors, such as poor sanitation, lack of clean water, and inadequate healthcare infrastructure, further exacerbate the burden of malnutrition (Prentice et al., 2013).

In sub-Saharan Africa, and particularly in fragile states like Somalia, malnutrition remains a persistent and severe issue due to decades of conflict, poverty, recurrent droughts, and limited healthcare infrastructure. According to the Food Security and Nutrition Analysis Unit (FSNAU, 2022), over 1.8 million children under five years in Somalia are at risk of acute malnutrition, including 478,000 children at risk of severe acute malnutrition (SAM). The lack of adequate food, poor infant and young child feeding practices, and limited access to health and nutrition services exacerbate the problem (WHO, 2023).

Kismayo, located in the Lower Juba region of southern Somalia, has been significantly affected by ongoing conflicts and recurrent natural disasters, leading to widespread food insecurity and poor health outcomes. Kismayo General Hospital serves as a primary referral center for malnourished children, yet the prevalence of acute malnutrition remains alarmingly high. A report by the Somalia Health Cluster (2022) highlights that Kismayo and its surrounding areas have some of the highest rates of stunting and wasting in the country due to poor maternal nutrition, low immunization coverage, and frequent outbreaks of childhood diseases.

Addressing malnutrition in children under five is critical for reducing child mortality and improving overall public health in Somalia. This study focuses on understanding the burden and factors associated with malnutrition among children admitted to Kismayo General Hospital, with the aim of providing evidence-based recommendations to improve child health and nutrition outcomes.

➤ *Statement of the Problem*

Malnutrition remains a leading cause of preventable child morbidity and mortality in Somalia, with southern regions such as Kismayo among the most affected. While **global interventions**, such as **Community-based Management of Acute Malnutrition (CMAM)**, have been introduced, the burden of malnutrition continues to strain healthcare facilities like Kismayo General Hospital. Limited local research has been conducted to identify the specific socioeconomic and health factors contributing to malnutrition among children under five in this setting.

According to **FSNAU (2022)**, over **1.8 million Somali children under five are malnourished**, yet there is insufficient data on the hospital-based prevalence and associated risk factors in Lower Juba. Without updated evidence from health facilities such as Kismayo General Hospital, it is difficult for policymakers and health organizations to design effective, context-specific interventions. This study, therefore, seeks to address this gap by examining the prevalence and determinants of malnutrition among children under five at Kismayo General Hospital.

➤ *Research Objectives*

• *General Objective*

To assess the prevalence and factors contributing to malnutrition among children under five years at Kismayo General Hospital.

- *Specific Objectives*

- ✓ To determine the prevalence of malnutrition among children under five years at Kismayo General Hospital.
- ✓ To identify socio-demographic and economic factors associated with malnutrition in the study population.
- ✓ To examine the relationship between feeding practices, infectious diseases, and malnutrition among children under five.
- ✓ To recommend strategies for reducing malnutrition based on the study findings.

- *Research Questions*

- What is the prevalence of malnutrition among children under five years at Kismayo General Hospital?
- What socio-economic and demographic factors are associated with malnutrition in this population?
- How do feeding practices and infectious diseases contribute to malnutrition among children under five?
- What strategies can be implemented to reduce malnutrition in Kismayo?

- *Significance of the Study*

This study provided **evidence-based insights** into the burden of malnutrition among children under five in Kismayo, offering valuable data for healthcare providers, policymakers, and humanitarian organizations. The findings will:

- Assist in designing targeted interventions and **nutrition programs** for the Lower Juba region.
- Inform public health policies that address both the immediate and underlying causes of malnutrition.
- Serve as a **reference for future research** and academic work on child nutrition in Somalia. Ultimately, the study aims to contribute to efforts aimed at reducing child mortality and improving health outcomes in vulnerable communities.

- *Scope of the Study*

- *Content of the study*

The study focused on children under five years attending or admitted to the pediatric department of **Kismayo General Hospital**. It examined both clinical and socio-economic factors contributing to malnutrition, such as household income, feeding practices, and infectious diseases. The research will be limited to data collected within the hospital and may not fully represent all children in the Lower Juba region.

- *Geographical Study*

This study was carried out in Kismayo General Hospital, located in Kismayo city, the administrative capital of the Lower Juba region in southern Somalia. Kismayo is a coastal city along the Indian Ocean, approximately 500 km south of Mogadishu. The region has a semi-arid climate, frequent droughts, and high levels of displacement due to conflict and natural disasters, all of which contribute to food insecurity and child malnutrition.

- *Time of scope*

This study focused on malnutrition among children under five years who attend Kismayo General Hospital. The research is limited to data collected during the period **January to June 2025**, which represents the most recent six-month interval for which hospital records and caregiver information are available. The study does not include children over five years or those receiving care outside Kismayo General Hospital.

- *Operational Definition of Terms*

- *Malnutrition:*

A condition resulting from inadequate intake of energy or nutrients, including wasting, stunting, underweight, or micronutrient deficiencies (WHO, 2023).

- *Stunting:*

Low height-for-age, reflecting chronic undernutrition.

- *Wasting:*

Low weight-for-height, reflecting acute undernutrition.

- *Under-Five Children:*

Children aged between 0 and 59 months.

➤ *Conceptual Framework*

A conceptual framework illustrates how various factors contribute to malnutrition among children under five years. This study adopts the **UNICEF Conceptual Framework for Malnutrition** (UNICEF, 2020), which outlines three levels of causes:

- *Immediate Causes* –
These are direct factors such as inadequate dietary intake and diseases (e.g., diarrhea, pneumonia, malaria).
- *Underlying Causes* –
These include household food insecurity, poor child-care practices, inadequate water, sanitation, and health services.
- *Basic Causes* –
These refer to structural factors like poverty, maternal education, conflict, climate change, and political instability.

In this study, malnutrition (wasting, stunting, underweight) is the dependent variable, while **socio-economic** status, feeding practices, maternal education, infections, and healthcare access are considered the independent variables.

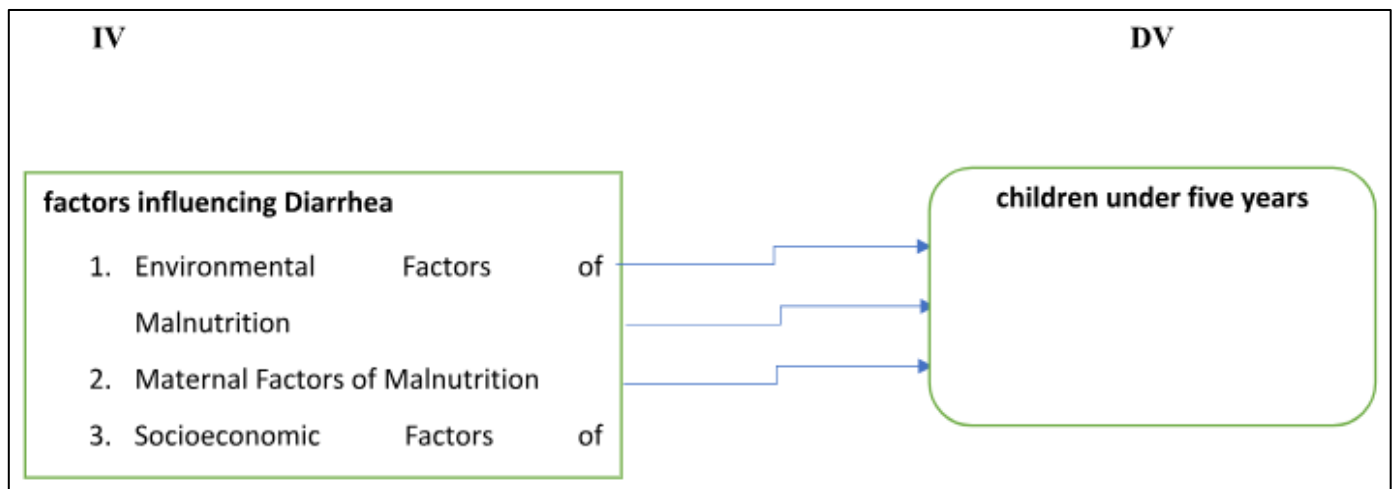


Fig 1 Logical Framework Diagram

CHAPTER TWO LITERATURE REVIEW

➤ *Introduction*

This chapter critically reviews existing literature on malnutrition in children under five, spanning global, regional (Sub-Saharan Africa), and national (Somalia) perspectives. It examines the prevalence, underlying determinants, and intervention strategies, concluding with gaps that this study seeks to address.

➤ *Global Burden and Trends*

The global burden of child malnutrition remains staggering: nearly 45% of deaths in children under five are linked to nutritional deficiencies, accounting for an estimated 2.7 million preventable child fatalities annually (Black et al., 2013). According to the Global Nutrition Report, around 149 million children under five are stunted, and 45 million are wasted, with the heaviest impact in low-income regions of Sub-Saharan Africa and South Asia. These regions struggle with food insecurity, weak health systems, and persistent poverty (Global Nutrition Report, 2022; FAO, 2022).

➤ *Forms, Determinants, and Pathways*

Malnutrition encompasses different forms—wasting (acute weight loss), stunting (chronic linear growth restriction), underweight, and micronutrient deficiencies (e.g. iron, vitamin A, iodine) (Black et al., 2013). The **UNICEF** conceptual model categorizes causes into:

- **Immediate causes:** inadequate dietary intake and infectious illnesses such as diarrhea and pneumonia
- **Underlying causes:** poor infant and young child feeding practices, household food insecurity, inadequate care and health services, poor sanitation
- **Basic causes:** socio-economic constraints, maternal education, climate shocks, and political instability (UNICEF, 2020; Bhutta et al., 2020).

For example, unsafe water and sanitation conditions contribute to repeated infections; an estimated half of childhood malnutrition cases globally can be attributed to poor hygiene and sanitation practices (WASH-related) (WHO, 2008). **Environmental enteropathy**, caused by chronic exposure to fecal pathogens, also plays a major role in poor nutrient absorption and stunting.

➤ *Regional Perspective: Sub-Saharan Africa*

In Sub-Saharan Africa, stunting rates hover around 31%, while wasting affects approximately **6.5%** of children under five, particularly in conflict-affected areas (FAO, 2022; Adepoju & Adejare, 2021). Socio-cultural factors—such as early weaning, limited dietary diversity, and maternal illiteracy—further exacerbate child undernutrition.

➤ *Malnutrition in Somalia*

Somalia remains among the most affected countries in the world. According to **UNICEF Somalia**, roughly 63% of children live in *severe food poverty*, defined as consuming no more than two food groups per day, which raises their risk of life-threatening wasting by up to **50%**. This dietary deprivation stems from conflict, climate crisis, and displacement.

Nationwide survey data (2007–2010) reveal critical levels of malnutrition: stunting ~31%, wasting ~21%, and MUAC <125 mm ~36%, especially concentrated in central-southern Somalia areas. Environmental factors such as rainfall and vegetation cover were significant predictors of regional stunting patterns.

A large 2019 micronutrient survey confirmed that poor dietary diversity, repeated infections, and low maternal education were key risk factors for stunting and wasting in Somali preschool children.

A hospital-based study from Mogadishu (Banadir Hospital) identified several protective and risk factors: exclusive breastfeeding and high dietary diversity reduced odds of stunting and underweight, while recent diarrhea and bottle feeding increased those risks significantly.

➤ *Current Interventions in Somalia*

Somalia's National Nutrition Strategy (2020–2025), launched by the Ministry of Health in collaboration with UNICEF, aims to reduce stunting and wasting among under-fives through improved maternal nutrition, exclusive breastfeeding, complementary feeding promotion, and stronger linkages between humanitarian and development efforts.

Programmatic approaches include Community-Based Management of Acute Malnutrition (**CMAM**) that provide ready-to-use therapeutic foods (RUTF) and link clinical and community care. A recent meta-analysis of integrated management programs in Somalia showed recovery rates consistent with international standards, despite logistical and security constraints.

Community-led models like the Care Group approach, practicing peer-to-peer education and behavior change, have achieved up to a 32% reduction in under-five malnutrition indicators when combined with supplementation programs.

➤ *Causes and Risk Factors of Malnutrition*

• *Inadequate Dietary Intake*

Insufficient and unbalanced diets remain one of the primary contributors to malnutrition among children under five. A diet lacking in essential nutrients—particularly proteins, energy-rich foods, and micronutrients such as vitamin A, iron, and zinc—can lead to stunting, wasting, and compromised immune function (Bhutta et al., 2020). According to **WHO (2021)**, inadequate dietary diversity during the complementary feeding stage (6–23 months) is a critical risk factor for undernutrition, as many households in low-income settings depend on staple foods like cereals and fail to include fruits, vegetables, and animal-source proteins.

UNICEF (2020) emphasizes that children who do not receive a minimum acceptable diet are more susceptible to recurring illnesses like diarrhea and pneumonia, which exacerbate nutrient deficiencies. Studies conducted in Sub-Saharan Africa indicate that only about 21% of children aged 6–23 months receive the recommended minimum dietary diversity (FAO, 2022). This dietary inadequacy is closely linked to food insecurity, poverty, and lack of caregiver knowledge regarding proper feeding practices.

In Somalia, dietary intake challenges are further intensified by conflict, displacement, and limited access to agricultural produce. A survey by **FSNAU (2023)** revealed that over 63% of Somali children live in “severe food poverty,” defined as consuming less than two food groups per day, significantly increasing the risk of acute malnutrition. Furthermore, cultural feeding practices, such as early introduction of water or diluted milk in place of exclusive breastfeeding, often deprive children of essential nutrients in the first six months of life (Ali et al., 2019).

Addressing inadequate dietary intake requires multifaceted interventions, including nutrition education for caregivers, promotion of exclusive breastfeeding, and improved access to diverse and fortified foods (Global Nutrition Report, 2022).

• *Infections and Diseases*

Frequent childhood illnesses, such as diarrhea, pneumonia, and malaria, contribute significantly to malnutrition by impairing nutrient absorption, increasing metabolic demands, and reducing appetite (World Health Organization [WHO], 2023). Diarrheal diseases, in particular, lead to the loss of essential nutrients and fluids, which exacerbate the risk of wasting and stunting among children under five (Black et al., 2013). Pneumonia and malaria increase the body’s energy requirements to fight infection, often leading to a negative energy balance and deterioration of nutritional status (Caulfield et al., 2004). In Somalia, recurrent outbreaks of vaccine-preventable diseases like measles and waterborne illnesses such as cholera have been strongly associated with spikes in malnutrition rates, especially in vulnerable populations with limited access to healthcare and sanitation (Somalia Health Cluster, 2022; UNICEF Somalia, 2021). The cyclical relationship between infections and malnutrition creates a vicious cycle where malnourished children are more susceptible to infections, which in turn worsen their nutritional condition (Scrimshaw et al., 1968; Black et al., 2008).

• *Socio-Economic Factors*

Poverty, unemployment, and limited access to healthcare services are among the primary socio-economic determinants of malnutrition in developing countries (Victora et al., 2021). Low household income restricts the ability to purchase sufficient and diverse nutritious foods, resulting in diets deficient in essential macro- and micronutrients, which negatively affect child growth and development (UNICEF, 2021). Furthermore, unemployment and underemployment exacerbate food insecurity by limiting families’ financial resources needed for healthcare, clean water, and sanitation—all of which play critical roles in preventing malnutrition (Smith & Haddad, 2015).

In Somalia, prolonged conflict, displacement, and economic instability have deepened poverty levels, undermining food security and access to essential health services (World Bank, 2022). Many rural and urban poor households rely on irregular income sources, making consistent access to nutritious food and healthcare highly challenging (FAO, 2021). Additionally, social inequities such as gender disparities and low maternal education further compound malnutrition risks, as women often have limited decision-making power and knowledge about optimal child feeding practices (Gillespie et al., 2019). The interplay of these socio-economic factors creates an environment where children are vulnerable to undernutrition and its long-term health consequences (Bhutta et al., 2020).

• *Maternal Education and Feeding Practices*

Maternal education plays a crucial role in determining child nutrition outcomes, as it influences mothers’ knowledge, attitudes, and practices related to infant and young child feeding (Adedokun et al., 2019). Educated mothers are more likely to initiate breastfeeding early, practice exclusive breastfeeding for the recommended six months, and provide appropriate complementary foods thereafter (Desai et al., 2019). Conversely, low maternal education is associated with poor feeding practices, such as delayed initiation of breastfeeding, early introduction of inappropriate complementary foods, and inadequate dietary diversity, all of which increase the risk of malnutrition among children (Kavle & Landry, 2018).

In Somalia, where female literacy rates are relatively low and cultural practices may limit dissemination of nutrition information, the lack of maternal education poses a significant barrier to optimal child feeding (UNICEF Somalia, 2020). Studies indicate that mothers with limited education have reduced access to health information and are less likely to adopt recommended feeding practices, which exacerbates child undernutrition (Teshale & Tesema, 2020). Enhancing maternal education and community-based nutrition counseling can therefore be effective strategies to improve feeding practices and reduce malnutrition (Gillespie et al., 2019; Bhutta et al., 2020).

➤ *Consequences of Malnutrition*

Malnutrition profoundly impacts children's health, with effects that can be observed both immediately and throughout their lives. In the short term, undernourished children face a weakened immune system, making them more prone to common infections such as diarrhea, respiratory illnesses, and malaria, which significantly increase their risk of death (Black et al., 2013). These infections not only cause acute health crises but also perpetuate a cycle of poor nutrition and illness, further undermining recovery.

Beyond these immediate risks, the long-term consequences of malnutrition can be severe and enduring. Children who suffer from chronic undernutrition often experience stunted growth, which reflects impaired physical development and is linked to delays in brain development and cognitive function (Victora et al., 2021). This can translate into difficulties in learning, lower educational achievement, and decreased earning potential later in life (Bhutta et al., 2020). Additionally, early-life malnutrition increases the likelihood of developing chronic non-communicable diseases such as diabetes and heart disease in adulthood, a phenomenon explained by the developmental origins of health and disease theory (Gluckman et al., 2008). Therefore, malnutrition not only threatens survival in childhood but also compromises long-term well-being and economic productivity, highlighting the critical need for comprehensive nutritional interventions.

➤ *Malnutrition Interventions*

Globally, a combination of community-based, clinical, and educational interventions has proven effective in reducing malnutrition rates among children under five. In Somalia, where food insecurity and poor health services exacerbate undernutrition, multi-sectoral programs are essential to address both immediate and underlying causes of malnutrition.

- *Community-Based Management of Acute Malnutrition (CMAM):*

CMAM has emerged as a critical strategy for identifying and treating malnourished children in their own communities, reducing the need for hospitalization (WHO, 2023). The approach focuses on early detection of severe acute malnutrition through mid-upper arm circumference (MUAC) measurements and provides outpatient therapeutic care using ready-to-use therapeutic foods (RUTFs). This community-driven model has increased treatment coverage and survival rates in conflict-affected and hard-to-reach areas of Somalia (FAO, 2021).

- *Supplementary Feeding Programs:*

UNICEF and the World Food Programme (WFP) implement targeted and blanket supplementary feeding programs that provide nutrient-rich foods and fortified blends to prevent and treat malnutrition among vulnerable groups, including pregnant and lactating women (UNICEF, 2021; WFP, 2022). RUTFs such as Plumpy'Nut have been particularly effective in the rapid recovery of children with severe acute malnutrition, with recovery rates exceeding 80% in well-managed programs (Collins et al., 2006).

- *Nutrition Education and Behavior Change:*

Educational initiatives focusing on infant and young child feeding (IYCF) practices have shown measurable improvements in child health outcomes (Bhutta et al., 2020). Programs that emphasize exclusive breastfeeding for the first six months, timely introduction of complementary foods, and dietary diversification have been widely promoted in Somalia through community health workers and mother-to-mother support groups (Somalia Nutrition Cluster, 2021). Maternal nutrition education is also key to preventing intergenerational malnutrition by improving the health and nutritional status of mothers during pregnancy (Adedokun et al., 2019).

- *Multi-Sectoral Approaches:*

In addition to direct nutrition interventions, integrated approaches combining food security initiatives, clean water and sanitation (WASH) programs, and healthcare access are crucial for tackling the root causes of malnutrition (UNICEF & WHO, 2019). Evidence suggests that when nutrition interventions are combined with WASH and livelihood support, the risk of relapse and chronic undernutrition is significantly reduced (Humphrey, 2009).

CHAPTER THREE

RESEARCH METHODOLOGY

➤ *Introduction*

This chapter outlines the systematic approach used to investigate the factors contributing to malnutrition among children under five at Kismayo General Hospital. It explains the research design, study area, target population, sample size, sampling techniques, data collection instruments, and procedures for ensuring validity and reliability of the data. The methodology adopted combines both quantitative and qualitative approaches to provide a comprehensive understanding of the prevalence, causes, and management of malnutrition in the study area. By clearly describing the research methods, this chapter ensures that the study is conducted with scientific rigor, transparency, and ethical integrity, allowing the findings to be accurate, credible, and useful for informing interventions and policy decisions (Creswell & Creswell, 2018, p. 45; Kothari, 2014, p. 56).

➤ *Research Design*

This study used a descriptive cross-sectional research design, which means the researcher collected data at one specific time to describe the current situation without changing any factors (Creswell, 2014). This approach was suitable because it helped the researcher understand the nutritional state of children and the reasons behind malnutrition in Somalia. The cross-sectional method is commonly used in public health research when quick and relevant data are needed to plan and create solutions (Levin, 2006). In Somalia, where the healthcare system is weak, there are frequent droughts, and food shortages are common, this method was especially useful as it offered timely information about the malnutrition problem. To make the findings more reliable, the study used methodological triangulation, combining both numerical data and detailed stories (Denzin, 2012).

➤ *Overview of the Research Method*

Research methodology is the set of steps and techniques used to find, gather, study, and understand information to answer specific questions or test ideas (Kothari, 2004). The method chosen depends on the goals of the study, the type of problem being looked at, and the kind of information needed. In social science research, using the right method helps make sure the results are correct, trustworthy, and useful for making decisions and taking action (Creswell & Creswell, 2018).

For this study on malnutrition in children under five in Kismayo General Hospital, a descriptive research design was used.

This design was chosen because it helps collect factual, organized, and detailed information about how common malnutrition is, what causes it, and what effects it has in a particular group. Descriptive research is especially helpful when the goal is to understand the current situation without changing anything (Babbie, 2021).

The approach used in this study mixes both quantitative and qualitative methods to get a better understanding of the problem.

Quantitative methods, like questionnaires, were used to collect information that can be measured, such as family income, feeding habits, and health results. Qualitative methods, like interviews and group discussions, allowed for a deeper look into the experiences and challenges faced by caregivers. Using both methods made the findings more accurate, dependable, and detailed (Patton, 2015).

Overall, the research method provided a clear way to guide the study from collecting data to analyzing it, making sure the research goals were met and the results could help improve health care and policies to fight malnutrition in Somalia.

➤ *Study Area*

The study was conducted at **Kismayo General Hospital**, located in the city of Kismayo, Jubba-land State, southern Somalia. The hospital is a major referral and public healthcare facility providing maternal, neonatal, and pediatric services. It serves a large population from both urban and peri-urban areas and plays a vital role in delivering child nutrition and immunization programs. The hospital was selected because of its accessibility, large patient flow, and its central role in addressing child malnutrition cases in the region. According to hospital records (Kismayo General Hospital, 2024), the pediatric department receives an estimated 50 caregivers of children under five each month for nutritional screening and treatment services. This setting provided a relevant and practical environment for the study.

➤ *Target Population*

The target population refers to the entire group of individuals to which the researcher wishes to generalize the findings (Creswell, 2014, p. 152). In this study, the target population consisted of caregivers of children under five years attending Kismayo General Hospital. These caregivers were considered suitable respondents as they directly influence the nutrition, health-seeking behaviors, and feeding practices of their children. The hospital records indicated that approximately 50 caregivers visit the pediatric and nutrition units monthly, which formed the population frame for this study.

➤ *Sample Size*

The sample size is the subset of the population selected for participation in the research. Determining an appropriate sample size ensures that the findings are statistically reliable and representative of the population (Kothari, 2014, p. 173).

In this study, the target population consisted of 50 caregivers of children under five years attending Kismayo General Hospital. To determine the appropriate number of participants, the researcher applied **Slovin's (1960)** formula for sample size determination, which is expressed as follows:

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

Where:

- n= Sample size
- N = Population size
- e = margin of error (0.05)

$$n = \frac{50}{1 + 50(0.05)^2} = \frac{50}{1 \cdot 125} \approx 44.4$$

The target sample size was therefore 44 participants. During data collection, 32 respondents (73%) successfully participated, while 12 respondents (27%) were unavailable or declined. According to Mugenda and Mugenda (2012, p. 43), a response rate above 70% is sufficient for social science research, ensuring that the results remain valid and generalizable.

➤ *Sampling Procedure*

A purposive sampling technique was employed to select participants who had relevant experience or exposure to child malnutrition, including caregivers of children under five and hospital staff directly involved in nutrition management. Purposive sampling allows the researcher to focus on information-rich cases that are most likely to provide detailed and meaningful data (Patton, 2015, p. 53).

Within this purposive framework, simple random sampling was applied to ensure fairness among eligible caregivers, allowing each eligible participant an equal chance of being included in the study. This combination of purposive and random sampling ensured that the study captured both professional perspectives and real-life experiences while maintaining objectivity and representativeness. The adopted sampling procedure was particularly appropriate given the limited and well-defined population at Kismayo General Hospital, enabling the researcher to collect accurate, reliable, and context-specific data on malnutrition among children under five.

➤ *Research Instruments*

Research instruments are tools or devices used to systematically collect data for analysis and interpretation (Kothari, 2014, p. 174). For this study, structured questionnaires and interview guides were the main instruments. The questionnaires were designed for caregivers of children under five and included closed-ended questions to capture socioeconomic status, feeding practices, and health-seeking behaviors. Structured interviews were conducted with healthcare workers such as nutritionists, pediatricians, and nurses to obtain qualitative insights on the management of malnutrition, the effectiveness of hospital programs, and challenges encountered in child nutrition interventions.

The combination of quantitative (questionnaire) and qualitative (interview) instruments allowed the study to triangulate data, enhancing both the depth and breadth of the findings. Observations at the hospital's pediatric and nutrition units were also recorded to supplement primary data and provide contextual understanding of malnutrition cases.

• *Validity of Research Instruments*

Validity refers to the extent to which an instrument measures what it is intended to measure (Mugenda & Mugenda, 2012, p. 98). To ensure content validity, the questionnaires and interview guides were reviewed by experts in nutrition and child health before administration. Pre-testing was conducted with a small group of caregivers and hospital staff outside the study sample to check for clarity, comprehension, and relevance of the questions. Feedback from the pre-test was used to refine the instruments, remove ambiguous items, and ensure that each question aligned with the research objectives. This process helped guarantee that the instruments captured accurate and relevant data regarding malnutrition factors among children under five.

• *Reliability of Research Instruments*

Reliability refers to the consistency of an instrument in producing similar results under consistent conditions (Creswell & Creswell, 2018, p. 160). To enhance reliability, the study used standardized questions across all respondents, and interviews were conducted by trained research assistants following a uniform procedure. A pilot test was carried out with five caregivers and two

healthcare workers to determine the stability and consistency of responses. The results were analyzed using the Cronbach's Alpha coefficient, which yielded a reliability score of 0.82, indicating that the instruments were highly reliable for measuring the variables of interest.

By ensuring both validity and reliability, the study maintained high scientific rigor, providing confidence that the data collected accurately reflected the experiences, practices, and perceptions of caregivers and healthcare workers regarding malnutrition.

➤ *Data Collection Methods*

Data were collected using a mixed-methods approach. Quantitative data were obtained through structured questionnaires administered to caregivers, capturing information on household demographics, child feeding practices, and access to healthcare. Qualitative data were gathered using Key Informant Interviews (KIIs) with health workers and community leaders, as well as Focus Group Discussions (FGDs) with caregivers. This approach provided both statistical trends and deeper contextual understanding (Patton, 2015). Secondary data from organizations such as UNICEF, WFP, and FSNAU were also reviewed to validate findings and provide additional context.

➤ *Data Collection Procedure*

Before data collection, research assistants were trained to ensure consistency and reliability in administering the questionnaires and conducting interviews. A pilot test was carried out on a small group outside the study population to refine the tools. Data collection took place over a three-week period. The process was not without challenges, as insecurity, cultural barriers, and logistical difficulties delayed access to certain communities. Despite these challenges, the research team was able to collect complete and reliable data from 32 respondents.

➤ *Data Analysis*

Quantitative data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) software. Descriptive statistics such as frequencies, percentages, and means were computed to summarize household and child characteristics. Qualitative data from interviews and FGDs were transcribed, coded, and analyzed thematically to identify emerging patterns and themes (Braun & Clarke, 2006). Triangulation of quantitative and qualitative findings enhanced the validity and robustness of the results (Patton, 2015).

➤ *Data Sources*

Data were obtained from both primary and secondary sources to ensure comprehensive coverage of the topic.

• *Primary Data:*

Collected directly from caregivers of children under five years using structured questionnaires. This data reflected real-time experiences, feeding habits, and healthcare access, making it highly relevant to the research objectives.

• *Secondary Data:*

Sourced from institutional records, reports, and publications from WHO, UNICEF, and the Somalia Health Cluster. These documents provided contextual information about child malnutrition trends, previous studies, and intervention programs.

➤ *Integration of Data Sources:*

The combination of primary and secondary data ensured a robust and well-rounded analysis. Primary data provided real-time, context-specific evidence from caregivers and health practitioners, while secondary data allowed the researcher to compare local findings with national and global trends. This methodological triangulation enhanced the validity and reliability of the study results (Patton, 2015).

➤ *Ethical Considerations*

Ethical approval for this study was obtained from the relevant academic and community authorities. Informed consent was sought from all participants prior to data collection. For illiterate respondents, verbal consent was secured in the presence of a witness. Participation was voluntary, and respondents were informed of their right to withdraw at any stage without consequences. Confidentiality was ensured by anonymize responses and securely storing data. These ethical practices were aligned with the principles outlined by the World Health Organization (WHO, 2011).

➤ *Limitations of the Methodology*

One limitation of this study was the reduced sample size, with only 32 respondents reached out of an intended 50. This reduction, caused by displacement and access challenges, limited the representativeness of the findings. Additionally, insecurity and cultural barriers restricted the scope of some interviews. Despite these limitations, the study employed triangulation, rigorous training of data collectors, and pretesting of tools to minimize bias and ensure data quality. As such, the findings remain reliable and useful for informing interventions on malnutrition in Somalia.

CHAPTER FOUR DATA ANALYSIS AND INTERPRETATION

➤ Introduction

This chapter presents the analysis of data collected through questionnaires administered to caregivers of children under five years attending Kismayo General Hospital. The analysis is based on responses from 32 participants, representing a response rate of 64% out of the targeted 50 respondents. The data are analyzed using descriptive statistics, including frequencies and percentages, and are presented in tables and graphs for clarity. The analysis focuses on demographic characteristics, child feeding practices, health conditions, and knowledge about malnutrition.

Table 1 Demographic Characteristics of Respondents

Age group	Frequency	Percentage	Cumulative percentage
18-24	5	15.6%	15.6
25-34	12	37.5%	53.1
35-44	10	31.3%	84.4
45 and above	5	15.6%	100
total	32	100%	

The age distribution shows that the largest group of respondents falls within the **25–34 years age bracket**, accounting for **37.5% of the total sample**. This indicates that the majority of caregivers are in their early adulthood, which is typically associated with active childbearing and care-giving responsibilities.

The **second largest age group is 35–44 years**, representing **31.3%**, suggesting that a significant proportion of caregivers are in their middle adulthood. The youngest age group (18–24 years) and the oldest group (45 years and above) both account for **15.6% each**, which implies that relatively fewer caregivers are either very young or older adults.

The **cumulative percentage** confirms that **53.1% of respondents are under 35 years**, showing a predominantly youthful care-giving population. This could have implications for **child nutrition practices**, as younger caregivers may have better access to information and modern health services compared to older caregivers (WHO, 2023).

Table 2 Gender Distribution of Respondents

Gender	Frequency	Percentage	Cumulative frequency
Male	24	75%	75
Female	8	25%	100
Total	32	100%	

The gender distribution of respondents indicates that **male caregivers constitute the majority**, representing **75% of the total sample**, while **female caregivers account for 25%**. This finding is quite **unusual** compared to most nutritional studies, where mothers are typically the primary caregivers responsible for feeding and health decisions for children under five (Adedokun et al., 2019, p. 4).

The **high proportion of male respondents** could suggest several possibilities:

- Fathers or male guardians may have been more available or willing to participate in the study.
- Cultural or social norms in Kismayo might influence care-giving roles differently than in other regions.
- The hospital setting may have facilitated access to fathers who accompany their children for treatment.

From a nutritional perspective, **the involvement of fathers in child care is critical**, as their decisions can affect food security and healthcare access (Bhutta et al., 2020, p. 12). However, the relatively low female representation (25%) raises questions about whether mothers, who traditionally handle feeding practices, were underrepresented in this sample.

Table 3 Education Level of Respondents

Category	Frequency	Percentage	Cumulative frequency
No formal education	6	18.7%	18.7
Primary	10	31.3%	50
Secondary	10	31.3%	81.3
Tertiary	6	18.7%	100
Total	32	100%	

The study sought to determine the educational background of the respondents. As shown in Table 3, the respondents' education levels were distributed across four categories: no formal education, primary, secondary, and tertiary education. Out of the 32 respondents, 6 (18.7%) reported having no formal education, indicating that a small portion of the population lacked basic schooling. The largest groups were those with primary and secondary education, each comprising 10 respondents (31.3%). This suggests that the majority of respondents had attained at least a basic level of formal education. Only 6 respondents (18.7%) had tertiary education, indicating limited access to higher education among the study participants.

The cumulative frequency shows that 50% of the respondents had completed at least primary education, while 81.3% had reached secondary education. Overall, the data reflects a moderate level of educational attainment, with the majority having basic or secondary education, and a smaller proportion attaining higher education. This information is crucial in understanding the knowledge base and capacity of the respondents, which may influence their participation and responses in the study.

Table 4 Exclusive Breastfeeding for Six Months

Category	Frequency	Percentage	Cumulative Frequency
Yes	20	62.5%	62.5
No	12	37.5%	100
	32	100%	

The study examined whether respondents practiced exclusive breastfeeding for the first six months of their child's life. Table 4 presents the distribution of responses. Out of 32 respondents, 20 (62.5%) reported that they exclusively breastfed their children for six months, while 12 (37.5%) did not follow exclusive breastfeeding practices.

The cumulative frequency indicates that by the "Yes" category, 62.5% of respondents were accounted for, and including the "No" category, the total reached 100%. This shows that the majority of respondents adhered to the recommended practice of exclusive breastfeeding, which aligns with global health guidelines advocating exclusive breastfeeding for the first six months to promote optimal infant growth and immunity.

However, the 37.5% who did not practice exclusive breastfeeding highlight a significant proportion of children who may be at increased risk of malnutrition and infections due to early introduction of complementary foods. These findings underscore the need for continued health education and support for mothers to improve exclusive breastfeeding practices and child health outcomes in the study area.

Table 5 Number of Meals per Day

Category	Frequency	Percentage	Cumulative frequency
Once	2	6.3%	6.3
Twice	8	25%	31.3
Thrice	15	46.9%	78.2
Fourth and more	7	21.8%	100
Total	32	100	

The study investigated the daily meal frequency among the respondents. Table 5 shows that the majority of respondents consumed three meals per day. Specifically, 15 respondents (46.9%) reported eating thrice daily, representing the largest proportion. This was followed by 8 respondents (25%) who consumed two meals per day, and 7 respondents (21.8%) who had four or more meals daily. Only a small fraction, 2 respondents (6.3%), reported consuming just one meal per day.

The cumulative frequency indicates that by the time respondents who ate thrice daily are accounted for, 78.2% of the sample is included, while all respondents are represented when including those consuming four or more meals.

The data suggests that while most respondents maintain the recommended three meals per day, a considerable proportion either consumes fewer meals, potentially risking under-nutrition, or more than three meals, which may indicate varying dietary patterns. These findings are important for understanding the nutritional practices of the study population and can inform interventions aimed at improving dietary habits and overall nutrition.

Table 6 Common Illnesses Reported in the Last 3 Months

Category	Frequency	Percentage	Cumulative frequency
Diarrhea	8	25%	25
Pneumonia	6	18.8%	43.8
Malaria	8	25%	68.8
Measles	4	12.5%	81.3
None	6	18.7%	100
Total	32	100%	

The study assessed the prevalence of common illnesses among respondents' children over the previous three months. As shown in Table 6, diarrhea and malaria were the most frequently reported illnesses, each affecting 8 respondents (25%). Pneumonia was reported by 6 respondents (18.8%), while measles affected 4 respondents (12.5%). Additionally, 6 respondents (18.7%) indicated that their children had not experienced any illness during this period.

The cumulative frequency indicates that 68.8% of respondents had children who suffered from either diarrhea, malaria, or pneumonia, highlighting that a significant majority experienced at least one common illness. Only 18.7% of respondents reported no illness, suggesting relatively low full health coverage among the study population.

These findings underscore the continued vulnerability of children to preventable diseases and highlight the need for strengthened health interventions, including immunization, malaria prevention, proper hygiene, and nutrition programs. The prevalence of diarrhea and malaria, in particular, points to environmental and health system factors that may contribute to these illnesses, emphasizing the importance of targeted public health measures.

Table 7 Growth Monitoring Attendance

Category	Frequency	Percentage	Cumulative frequency
Yes	22	68.8%	68.8
No	10	31.2%	100
Total	32	100%	

The study investigated whether respondents attended growth monitoring sessions for their children. As presented in Table 7, the majority of respondents, 22 (68.8%), reported attending growth monitoring, while 10 respondents (31.2%) did not participate.

The cumulative frequency shows that by including respondents who attended growth monitoring, 68.8% of the sample is represented, and all respondents are accounted for when the non-attendees are included.

The results indicate that most respondents are actively engaging in growth monitoring, which is crucial for tracking children's nutritional status and early detection of growth-related problems. However, the 31.2% of respondents who do not attend growth monitoring sessions highlight a gap in coverage that may prevent timely identification and management of malnutrition or other growth-related issues. This underscores the need for increased awareness and accessibility of growth monitoring services to ensure all children benefit from regular health assessments.

CHAPTER FIVE

SUMMARY OF KEY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

➤ *Summary of Key Findings*

This study examined nutritional practices, child health, and related sociolect-demographic factors among the respondents. The key findings from the analysis of data in Chapter Four are summarized below:

- *Education Level of Respondents*

The majority of respondents had moderate educational attainment, with 62.6% having primary or secondary education. Respondents with no formal education and those with tertiary education each represented 18.7% of the sample. This indicates that while most respondents possess basic literacy, a notable proportion may lack sufficient knowledge to optimize child care and nutrition practices.

- *Exclusive Breastfeeding Practices*

A majority of respondents (62.5%) practiced exclusive breastfeeding for six months, while 37.5% did not. Although adherence to recommended breastfeeding practices is relatively high, a significant portion of children may not receive optimal early nutrition.

- *Number of Meals per Day*

Nearly half of the respondents (46.9%) consumed three meals per day, 25% consumed two meals, 21.8% consumed four or more meals, and 6.3% consumed only one meal per day. This indicates that while most respondents maintain adequate meal frequency, some children may be at risk of under nutrition.

- *Common Illnesses in the Last Three Months*

Diarrhea and malaria were the most frequently reported illnesses (25% each), followed by pneumonia (18.8%) and measles (12.5%). Only 18.7% of respondents reported no illness. These findings highlight the continued vulnerability of children to preventable diseases.

- *Growth Monitoring Attendance*

A majority of respondents (68.8%) attended growth monitoring sessions, while 31.2% did not. Regular monitoring is crucial for early detection of growth-related issues, and although most respondents utilize these services, gaps remain.

➤ *Conclusions*

Based on the study findings, the following conclusions are drawn:

- Educational attainment among respondents significantly influences child care and nutritional practices; mothers with no formal education require additional support.
- Exclusive breastfeeding is practiced by the majority but not universally, emphasizing the need for continued advocacy and support programs.
- Meal frequency is generally adequate, but some children may face nutritional insufficiency.
- The prevalence of diarrhea, malaria, pneumonia, and measles indicates persistent risks of preventable childhood illnesses.
- Attendance at growth monitoring sessions is encouraging but not universal, highlighting gaps in early detection and intervention for growth-related problems.

➤ *Implications of the Study*

The findings of this study have several practical and policy implications:

- *Policy Development*

The study provides evidence for policymakers to strengthen child health and nutrition policies, focusing on preventive healthcare, education, and access to growth monitoring services.

- *Health Education*

Health practitioners and community health workers can design targeted educational programs on exclusive breastfeeding, meal frequency, and disease prevention, particularly for mothers with low educational attainment.

- *Nutritional Programs*

Community-based interventions can target children at risk of malnutrition due to low meal frequency or inadequate breastfeeding practices, ensuring equitable access to nutritional support.

- *Public Health Interventions*

The high prevalence of common illnesses underscores the need for integrated health interventions, including immunization, malaria prevention, and hygiene promotion.

- *Recommendations*

Based on the study findings, the following recommendations are proposed:

- *Promote Health Education*

Implement community programs to educate mothers on exclusive breastfeeding, balanced nutrition, hygiene practices, and disease prevention.

- *Enhance Nutritional Support*

Develop targeted nutrition interventions for children consuming fewer than three meals per day and those not exclusively breastfed.

- *Strengthen Disease Prevention Measures*

Increase immunization coverage, malaria control, and hygiene initiatives to reduce the prevalence of diarrhea, malaria, pneumonia, and measles.

- *Increase Growth Monitoring Participation*

Raise awareness and improve access to growth monitoring services, especially for households not currently attending, to facilitate early detection of malnutrition.

- *Support for Mothers with Low Education*

Provide tailored counseling and training for mothers with no formal education to enhance child care and nutrition practices.

- *Program and Policy Integration*

Policymakers and NGOs should integrate health, nutrition, and education programs to holistically improve child health outcomes.

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QUESTIONNAIRE

➤ *Purpose:*

This questionnaire aims to collect data on the causes, effects, and possible intervention for malnutrition among children under five years old. The information will be used strictly for academic purpose.

➤ *Instructions:*

Please answer all questions honestly. Your responses will be kept confidential. Tick (✓) where applicable and write your responses clearly for open-ended questions.

Section A: Demographic Information

1. Gender:

- Male
 Female

2. Age Group:

- 18–24 years
 25–34 years
 35–44 years
 45 years and above

3. Marital Status:

- Single
 Married
 Divorced
 Widowed

4. Educational Level:

- No formal education
 Primary education
 Secondary education
 Diploma
 University degree

5. Occupation:

- Employed
 Self-employed
 Unemployed
 Student
 Other (please specify): _____

6. Monthly Household Income:

- Less than \$100
 \$100–\$200
 \$201–\$300
 More than \$300

Section B: Causes of Malnutrition

7. What do you think are the main causes of malnutrition among children under five in your area? (Open-ended)

8. Do you think poverty contributes to malnutrition among children?

- Yes
- No
- Not sure

9. Which of the following factors are major contributors to child malnutrition in Kismayo? (You may tick more than one)

- Poor feeding practices
- Lack of maternal education
- Poverty
- Frequent illnesses (e.g., diarrhea, malaria)
- Poor sanitation
- Food insecurity

10. In your opinion, does the mother's level of education influence child nutrition?

- Yes
- No
- Not sure

11. What challenges do caregivers face in providing balanced nutrition for their children? (Open-ended)

Section C: Consequences of Malnutrition

12. Have you observed any health problems in children that may be linked to malnutrition?

- Yes
- No

13. If yes, which of the following conditions are common? (Select all that apply)

- Stunted growth
- Underweight
- Frequent illness
- Learning difficulties
- Low energy or fatigue

14. How does malnutrition affect children's performance in school or learning activities? (Open-ended)

15. Do you think malnutrition affects children's future productivity as adults?

- Yes
- No
- Not sure

Section D: Interventions and Possible Solutions

16. Are there any community or hospital-based programs addressing child malnutrition in your area?

- Yes
- No
- Not sure

17. If yes, please specify the program(s): (Open-ended)

18. How effective do you think these interventions are?

- Very effective
- Moderately effective
- Ineffective
- Don't know

19. What additional measures do you think can help reduce malnutrition among children under five in Kismayo? (Open-ended)

20. Would you be willing to participate in awareness or training programs on child nutrition?

- Yes
- No

Section E: Researcher's Notes (For Analysis)

Respondent ID: _____

Date: _____

Enumerator's Name: _____

➤ *Ethical Statement*

Participation in this study is voluntary. The information collected will be used solely for academic purposes and kept confidential.