UNIVERSITY OF GHANA

MOTHER'S HEALTH SEEKING BEHAVIOR FOR CHILDREN UNDER FIVE AND CHILD NUTRITIONAL STATUS IN LIBERIA

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DECLARATION

I, Jonathan Mehn, hereby declare that this thesis submission is my original research work. Except for the references to others' work that are properly acknowledged, it contains no materials from previously published work by any other individual.

17 TH NOVEMBER 2025

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ACCEPTANCE

Accepted by the College of Social Sciences at the University of Ghana, Legon, in partial fulfilment of the requirements for the Master of Arts degree in Population Studies.

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DEDICATION

Glory be to God Almighty for life and good health! This scholarly work is proudly dedicated to my esteemed wife, Esther T. Fayiah Mehn, and my beloved daughter, Jonetha R.D. Mehn, whose moral and financial supports have been instrumental in advancing my academic pursuits.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
COR	Correlation Coefficient
CI	Confidence Interval
EAs	Enumeration Areas
FAO	Food and Agriculture Organization
SDGs	Sustainable Development Goals
LDHS	Liberia Demographic and Health Survey
HSB	Health Seeking Behavior
HIV	Human Immunodeficiency Virus
IMCI	Integrated Management of Childhood Illness
MDGs	Millennium Development Goals
OR	Odd Ratio
STIs.	Sexually Transmitted Infections
UN	United Nations

ABSTRACT

Background: Malnutrition is prevalent among children in developing countries, with malnourished children facing higher risks of severe illness and mortality. Understanding health-seeking behaviour of mothers and the nutritional status of children under five is essential to addressing mortality due to malnutrition. This study aimed to investigate health-seeking behaviours of mothers and nutritional status among children under five in Liberia.

Methods: This analysis used data from the 2019-2020 Liberia Demographic and Health Survey (LDHS), using a nationally representative survey of 2,566 children under five. The LDHS employed a two-stage stratified sampling method, selecting Enumerator Areas with probability-proportional-to-size. Descriptive statistics was used to summarize child-mother characteristics and stunting status, while binary logistic regression analysis was used to assess the associations between health-seeking behaviour, household wealth, and stunting, at a 95% confidence level.

Results: The stunting prevalence among Liberian children was 24.1%. Children from wealthier households had significantly lower odds of stunting compared to those from the poorest households (aOR = 0.13, 95% CI: 0.04-0.47, p = 0.002). Additionally, children who were breastfed had lower odds of stunting (aOR = 0.68, 95% CI: 0.49-0.95, p = 0.024). No significant associations were found between stunting and treatment-seeking behavior for common illnesses (aOR = 1.11, 95% CI: 0.81-1.54, p = 0.512) or maternal education at secondary (aOR = 0.84, 95% CI: 0.52-1.35, p = 0.472) and tertiary levels (aOR = 0.65, 95% CI: 0.07-5.70, p = 0.698).

Conclusion: Household wealth and breastfeeding practices significantly influenced stunting outcomes, highlighting the need for a multifaceted approach to child nutrition that addresses socioeconomic factors alongside timely healthcare and early nutrition interventions for children under five.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Health-seeking behaviour (HSB) is an action taken by people who think they have a health issue to find help (Latunji et al., 2018). Health services utilization by people within the community is sometimes affected by various factors, leading to different health results and levels of illness (Adongo &Asaarik, 2018). The utilization of health services among community dwellers is sometimes influenced by numerous factors that result in diverse health outcomes and disease burden (Adongo & Asaarik, 2018). Children represent the most at-risk age group in any society, making the under-five death rate an essential population metric and a significant indicator of a country's well-being. Remarkable strides have been made in reducing under-five mortality, with a global decrease of nearly 50% between 1990 and 2015. The decrease in child mortality was one of the key successes of the Millennium Development Goals (MDGs), especially Goal 4. Nevertheless, half a million children continue to lose their lives each year to curable illnesses. More than half of the health problems and deaths in young children around the world could be handled with simple and low-cost solutions. In sub-Saharan Africa, 1 in 12 children dies before turning five years (Abegaz et al., 2019).

In developing countries, malnutrition is increasingly prevalent among disadvantaged populations. The consequences of malnutrition are both severe and enduring. Research indicates that children suffering from malnutrition are at a greater risk of experiencing prolonged and more severe illnesses, as well as an elevated risk of mortality when compared to their well-nourished counterparts. Additionally, malnourished children may face delayed motor development, reduced cognitive function, and poorer performance in school (Peterson, 2013).

Research consistently demonstrates that more than 90% of maternal and child mortality occurs in developing countries, with the most vulnerable populations shouldering the heaviest burden of preventable deaths. Insufficient or inadequate access to maternal healthcare services markedly elevates the risks associated with a range of pregnancy-related complications. This lack of access not only contributes to increased maternal morbidity and mortality but also diminishes the likelihood of child survival Yaya et al., 2019).

Infant illness and mortality have emerged as critical global health priorities and are integral to the Sustainable Development Goals. In particular, by 2030, Target 2 of Sustainable Development Goal 3 (SDG 3) aims to eradicate avoidable deaths among infants and young children. Research shows that considerable progress has been achieved in lowering mortality and morbidity rates among under-five children between 1990 and 2015 when the number of deaths decreased from 12.7 million to 5.9 million. However, in numerous sub-Saharan African countries, children face an almost 80% higher risk of dying compared to those in high-income nations before the age of five(Budu et al., 2020).

Approximately 5.3 million children under the age of five died in 2018, with nearly half of these deaths taking place in sub-Saharan Africa, despite significant progress in lowering global child mortality. According to empirical data, children in this region have a more than 15 doubling increased risk of dying before turning five years old when compared to their counterparts in high-income nations (Adedokun & Yaya, 2020a). The burden of morbidity significantly contributes to this alarming mortality rate, as conditions such as pneumonia, malaria, and diarrhea were associated with approximately 29% of global deaths among children under five in 2018(Adedokun & Yaya, 2020a). About 45% of deaths among children under five worldwide are linked to nutrition-related factors. In Tanzania, over 500,000 children under the age of five are affected by severe wasting, representing 3.5 percent of the total population of Tanzanian children aged 0 to 59 months (Lyimo et al., 2024). Ensuring that sick children

receive medical care is a vital part of promoting the wellbeing of a child. Various programs have been developed to guarantee that children access adequate treatment during times of illness. One notable initiative is the Integrated Management of Childhood Illness (IMCI) program, which provides direction to the international child health community regarding the best ways to assist nations in raising child survival rates(Adedokun & Yaya, 2020b).

Despite continuous initiatives to improve child health, many mothers and other caregivers choose not to get their kids medical attention, which poses a serious risk to the survival of children under five. Various factors contribute to the inadequate utilization of healthcare services for these children. These include the caregiver's educational background, the child's age, place of residence, perceptions regarding the significance of receiving treatment early, exposure to information, Income level, birth order, socioeconomic status, and occupational status are important factors to consider(Adedokun & Yaya, 2020b).

Over the past years, interest in providing universally accessible primary care services in low-income countries has increased, particularly among people who have emerged from protracted civil wars (Kentoffio et al., 2016). Primary care spending can improve health outcomes at a reasonable cost, particularly for low socioeconomic groups. Following the conclusion of a 14-year civil war, Liberia adopted this strategy to redesign its disjointed and severely damaged health system based on standards of fairness and effectiveness. Like many countries recovering from conflict, Liberia's healthcare system faces challenges such as insufficient infrastructure, a shortage of appropriately qualified health personnel, and limited oversight capacity (Kentoffio et al., 2016).

1.2 Statement of the Problem

Child undernutrition represents a significant global public health issue, resulting in higher rates of morbidity and mortality as well as lost potential. It is a serious problem in sub-Saharan

Africa that frequently does not get the attention it needs. Governments of countries with high levels of undernutrition usually do not address the issue properly unless it develops to the highest level. This is due to the multiple causes of undernutrition. It accounts for almost half of all deaths among under-five children, causing about 3.1 million infant deaths every year. Inadequate dietary intake and ongoing infectious illnesses lead to malnutrition. The primary markers of undernutrition are stunting, underweight, and wasting. Stunting, reflecting the cumulative effects of undernutrition, remains a greater problem compared to wasted or underweight infants under five in impoverished nations. Stunting is aggravated by illness and accurately reflects the long-term effects of undernutrition occurring before birth and during critical growth periods. Stunting rates are usually higher than underweight rates in most countries. 40% of children under five in sub-Saharan Africa are stunted, 21% are underweight, and 9% are wasted (Madiba et al., 2019).

It is undeniable that significant global efforts have been made to reduce child mortality in both developed and underdeveloped countries. In Africa, the healthcare system has struggled to adequately meet the needs of women (Yaya et al., 2019). With more than 510 maternal deaths per 100,000 live births recorded in 2020, maternal mortality rates in the sub-Saharan area are still extremely high. For decades, there has been a growing focus on enhancing the availability and quality of maternal healthcare services in developing nations, especially those like Liberia that are emerging from protracted civil war. Coordinated efforts are intended to lower the consistently high rates of maternal and newborn mortality. In 2003, for instance, Liberia emerged from a 14-year civil war. The country's healthcare system deteriorated throughout the exceptional events of the two consecutive Liberian civil wars (from 1989 to 1996 and 1997 to 2003, respectively), which led to poor health results nationwide. Due to the significant collapse of Liberia's healthcare system, there is now a greater reliance on alternative medical services

like traditional healers and religious beliefs about maternal health and children's well-being, amongst others (Yaya et al., 2019).

With more than 725 deaths for every 100,000 live births, Liberia has one of the worst rates of maternal mortality worldwide. While deaths among newborns, infants, and children under five have decreased in the past ten years, the rates remain very high, with 54 infant deaths per 1,000 live births and about 1 in 11 children dying before age five. According to these statistics, Liberia has one of the highest rates of maternal and newborn mortality in sub-Saharan Africa (Yaya et al., 2019).

In Liberia, many children suffer from malnutrition, and research has indicated that the consequences of malnutrition in early life can be severe, irreversible, and have long-term impacts on children. Understanding the health-seeking behavior and nutritional status of children under five is essential for tackling this issue, as mothers are usually the primary caretakers for their children. It is from this backdrop that the study seeks to investigate health-seeking behaviours and child nutritional status in Liberia to contribute meaningfully to Liberia's broader efforts by generating evidence-based insights into health-seeking behaviours and child nutritional status. These findings will inform realistic and actionable recommendations that support national policies aligned with Goals 3 and 5 by 2030.

1.3 Research Questions

The study was guided by the following research questions:

1. What is the prevalence of stunting among children under the age of five years in Liberia?
2. How is seeking treatment for childhood illnesses (fever/cough) associated with the prevalence of stunting among children under five years?

3. What is the relationship between household wealth status and stunting among children under five years in Liberia?

1.4 General Objective of the Study

To examine the association between health seeking behaviour and nutritional status of under five children in Liberia.

The specific objectives of the study are:

1. To determine the prevalence of stunting among children under the age of five years in Liberia.
2. To examine the relationship between seeking treatment for childhood illnesses (fever/cough) and stunting among children under five years of age.
3. To assess the relationship between household wealth status and the prevalence of stunting in children under five years of age.

1.5 Rationale of the Study

Liberia, a country in recovery from prolonged civil conflict, continues to grapple with significant challenges in maternal and child health. Despite advancements in healthcare infrastructure, the prevalence of maternal and child mortality remains distressingly high. Understanding the health-seeking behaviour of mothers is pivotal in developing effective interventions to enhance child's health and survival rates. The reduction of child mortality stands as a paramount global health priority and a key sustainable development goal. To reach as low as 25 fatalities per 1,000 live births, the world has set an ambitious goal to eliminate avoidable deaths of newborns and children under five by 2030 (Simieneh et al., 2019).

Women hold a universal reputation as the primary providers of home healthcare. A mother's approach to seeking healthcare, whether for preventive or curative purposes, significantly

impacts child survival through the child's health, nutritional status, and the mother's own well-being (MacKian, 2003). Research has shown that mothers who promptly seek medical care for their child's illnesses are more likely to achieve positive health outcomes and improved nutritional status for children under five. This study aims to enhance our understanding of the intricate factors influencing health-seeking behaviors and their effects on the nutritional status of young children in Liberia. The findings from this research will be instrumental in promoting better health-seeking practices for children under five, thereby improving their nutritional well-being and contributing to the prevention and reduction of morbidity and mortality within this age group in Liberia. Additionally, the results will serve as a guide for the post-Millennium Development Goals (MDGs), specifically within the framework of the Sustainable Development Goals (SDGs). Notably, Goal No. 2 emphasizes the objective of eradicating all forms of malnutrition for every individual by 2030, which includes achieving the internationally agreed targets of a 40% reduction in stunted growth among children and maintaining rates of wasting below 5%.

Additionally, drawing from these findings, policymakers will be better positioned to develop policies and programs aimed at educating mothers and caregivers about a holistic understanding of health-seeking behaviour. This approach will contribute to improved treatment adherence and strengthen health promotion strategies for children under five in Liberia.

1.6 Organization of the Study

The study is made up of six chapters. The background information, problem statement, research questions, study objectives, and justification are all included in the first chapter. In the second chapter, the theoretical and conceptual framework, the study's hypotheses, and relevant literature on childhood diseases and mothers' health-seeking behavior for children under five

are reviewed. The study's methodology is covered in Chapter Three, along with the limitations of the study. The background characteristics of the respondents are described in Chapter Four, along with the study's results, which include both bivariate and multivariate analyses. Chapter Five focuses on the discussion of the findings, situating them within the context of existing literature. The final chapter, Chapter Six, summarizes the main findings, provides conclusions, and offers recommendations for further study and policy interventions aimed at improving the management of childhood illnesses in Liberia.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter reviews empirical research on healthcare-seeking behaviours and the nutritional status of children under five, and the theoretical framework employed in the research. The conceptual framework and proposed hypotheses were informed by the research's theoretical underpinnings as well as the literature review.

In this study, Andersen's Behavioural Model informs the anticipated relationships between maternal characteristics, health-seeking behaviour, and child nutritional outcomes. The model postulates that healthcare use is a function of three sets of factors: predisposing (e.g., maternal education, age, occupation), enabling (e.g., household wealth, availability of health facilities), and need factors (e.g., child illness). These collectively influence a mother's decision to seek treatment for a sick child. This health-seeking decision, in turn, affects the child's growth and nutritional status. Hence, the model provides a theoretical pathway linking socioeconomic and behavioural factors to health and nutrition outcomes among children under five.

2.1.1 Prevalence of stunting among children under 5 years

Despite global progress in reducing stunting, it continues to pose a serious threat to public health, particularly in low- and middle-income nations. where socio-economic inequalities, poor maternal health, and inadequate childcare practices persist. As stated by the World Health Organization (WHO), global stunting prevalence dropped from 40.2% (95% CI: 39.1%-41.3%) in 1990 to 22.3% (95% CI: 21.8%-22.9%) in 2022 (WHO, 2024b). While this decline is promising, substantial disparities persist, with 36% of people in South Asia and 34% of people in sub-Saharan Africa suffering from stunting. On the other hand, places like Latin America,

the Pacific, and East Asia report much lower rates of 11%, while high-income countries show only 2% (Vaivada et al., 2020).

In displaced populations, stunting remains severe, with a pooled prevalence of 26% (95% CI: 21-31); internally displaced children report a prevalence of 37%, while refugee children report22%. Prevalence is highest in Africa (32%, 95% CI: 24-40) and Southeast Asia (34%, 95% CI: 24-46) (Choudhary et al., 2023). In South America, stunting varies widely, from 1.6% in Chile to 43.5% in Guatemala. Guatemala leads Latin America with 46.5%, followed by Honduras (22.6%) and Nicaragua (17.3%) (Montenegro et al., 2022). Stunting in Africa varies significantly, with prevalence ranging from 8.6% in Algeria to 52.2% in Libya, averaging around 31% (WHO, 2024b). In Central, Eastern, and Western Africa, stunting rates stand at 37.4%, 30.6%, and 30%, respectively, with lower rates in Southern and Northern Africa (FAO et al., 2023).

Country-specific studies in Africa show high stunting rates: 37.7% in southern Ethiopia (Mengesha et al., 2021), 41.1% in Uganda (Kasajja et al., 2022), and 37.5% in Rwanda (Rugema et al., 2022). Liberia has made progress, with stunting declining from 39% in 2011 to 26.6% in 2022, though malnutrition remains a persistent challenge.

2.2 Health-seeking Behaviour and Associated Factors

The World Health Organization (WHO) estimates that if mothers of children under five engage in appropriate health-seeking behavior, child mortality and morbidity could be reduced by 20%. This is because health-seeking behavior depends on both the inspiration and capacity of individuals to seek medical treatment as well as the accessibility of health facilities and other sources of health care. Common childhood illnesses can be effectively managed when recognized promptly, but the challenge of facilitating timely healthcare-seeking behavior persists. Numerous children succumb to preventable health issues due to mothers or caregivers'

delays in seeking healthcare. These delays negatively impact a child's health, often resulting in complications that render medical intervention less effective. Consequently, it is crucial to emphasize the significance of appropriate healthcare-seeking behavior as an essential aspect of parenting, as it plays a vital role in preventing children from experiencing preventable morbidity and mortality (Weldesamuel et al., 2019).

Globally, childhood illnesses are the leading cause of illness, particularly in the subcontinents of Asia and Africa. In 2013, there were approximately 6.3 million deaths worldwide among children under the age of five, deaths that could have been avoided with low-cost and low-tech interventions. Children under five are the most vulnerable group of people who suffer from common childhood illnesses; the under-five mortality rate in 2013 was forty-one per one thousand live births. Due to health, socioeconomic, and nutritional issues, children are vulnerable to malnutrition. A primary factor in child mortality worldwide, particularly in sub-Saharan Africa, is the delay in providing mothers with appropriate care in contemporary medical facilities. In Ethiopia, the second most populous country in Sub-Saharan Africa, has tried to improve in universal access to standard management of common childhood illnesses. However, the healthcare-seeking behaviour of mothers or caregivers for these illnesses remains low. This issue is particularly unclear and understudied in most Sub-Saharan African Countries, where health-seeking behaviour and its associated factors require further exploration and understanding. (Weldesamuel et al., 2019).

Moreover, the poor healthcare-seeking behaviours among other things like poverty, a lack of family support, and the conflicting demands of their jobs are contributing reasons to the lack of knowledge among mothers and caregivers of children under five. These have been some of the leading causes of the high infant and under-five mortality rates of 69 per 1,000 live births and infant mortality rate of 128 per 1000 live births respectively (Aigbokhaode et al., 2015).

Studies conducted in Mexico and India have revealed that mothers and other caregivers of children under five years old have inadequate knowledge and practice in seeking medical attention. This is primarily because of career opportunities and a failure to recognize the symptoms of common childhood illnesses like fevers, respiratory tract infections, and diarrhea and to seek medical attention right away. According to research conducted in Guatemala, 63% to 83% of children whose moms relied on home care experienced coughing, fever, and diarrhea, and they consistently used fewer health facilities, whether they were traditional or Western. As a result, children under five had higher rates of illness and mortality(Aigbokhaode et al., 2015).

Infant and under-five mortality rates have been documented in Nigeriathat, for every 1,000 live births, approximately 100 infants (aged 0-1 year) and 191 children (aged 0-5 years) unfortunately die before reaching their fifth birthday. Diseases like malaria, pneumonia, diarrhea, measles, HIV, neonatal disorders, malnutrition, and traumas are the main causes of morbidity and mortality among children under five in Nigeria. In many sub-Saharan African nations, it has been reported that the main reasons why mothers and other caregivers of children under five do not seek medical attention for their sick children are financial constraints, the distance to medical facilities, and the belief that the sickness is not serious(Aigbokhaode et al., 2015).

2.3 Factors Affecting Health-seeking Decisions for Under-Five Children

Infant and child mortality persist as a significant public health issue globally, notwithstanding the implementation of national programs aimed at enhancing child health in developing nations. In rural Sub-Saharan African regions, the poor utilization of child healthcare services significantly impacts the health and nutritional well-being of children. The healthcare-seeking behaviour of mothers, as primary caregivers, holds paramount importance in mitigating child mortality. Notably, in the context of developing countries, factors such as service cost, proximity to healthcare facilities, dissatisfaction with care quality, lack of transportation, and

high healthcare expenses have considerable influence on the decision-making process regarding seeking healthcare for children under five (Akter, 2022).

Of particular concern is the fact that an estimated 7.4 million children and adolescents succumbed to preventable or treatable causes in 2019, the majority of whom (70 percent, equivalent to 5.2 million) were under the age of five. Projections suggest that nearly 48 million children under the age of five will die between 2020 and 2030. Moreover, the burden of newborn mortality constitutes 44 percent of under-five mortality on a global scale, with a staggering 60 percent observed in South Asia (Akter, 2022).

Utilization of healthcare services is shaped by a complicated relationship of various factors including age, occupation, education, financial status, knowledge, family size, and prior encounters with child mortality. The lack of awareness regarding disease severity often leads to delayed treatment-seeking behaviour among mothers, resulting in unforeseen child mortality. Furthermore, the prevalence of self-medication practices among mothers in developing countries due to inadequate knowledge detrimentally impacts the efficacy of medical interventions, thereby contributing to unanticipated child mortality. Additionally, the decision to seek health treatment is also influenced by the availability of healthcare services and socio-cultural determinants (Dawkins et al., 2021; Akeju et al., 2016).

2.4 Effects of Malnutrition in Children Under Five

The period from birth to 5 years of age is crucial for the physical, mental, and emotional development of children into adulthood. Malnutrition during this time is a significant global public health concern, impacting proper brain development and children's growth, with both immediate and long-term effects on their well-being and financial output (Bangoura et al., 2023). The bulk of malnutrition-related deaths before the age of five occur in low- and middle-income nations, especially in South Asia and Africa, accounting for around 45% of all deaths.

International initiatives are giving this problem top priority, such as the UN Sustainable Development Goals. The goal of sustainable development 2.2 focuses on improving nutrition, eradicating all types of malnutrition, and reaching predetermined goals for stunting and wasting in children under five by 2025. It also strives to fulfill the nutritional needs of older people, pregnant and lactating women, and teenage females. Progress is not enough, though, to reach global goals. The last Global Nutrition Report, for instance, found that 6.9% of children under five were wasted and 21.3% were stunted. Roughly 31.1% of children under five in sub-Saharan Africa were stunted, and 6.3% were wasting(Bangoura et al., 2023).

2.5 Maternal Socio-demographic Characteristics and Child Nutritional Status

Demographic and various other factors influence the nutritional status of individuals, particularly children under five. Key factors include age, marital status, educational status occupation, residence, and wealth, which have been extensively studied about the nutritional status of young children worldwide, especially in developing countries (Anietor & Animu, 2021).

2.5.1 Maternal Educational Status and Child Nutritional Status

Research indicates a strong correlation between a mother's level of education and the well-being of her children. Studies have shown that children born to educated women are less likely to suffer from malnutrition, which can lead to underweight, wasting, and stunting. A mother's education is linked to improved nutritional outcomes for her children, as the literacy and numeracy skills acquired in school help her recognize and seek appropriate treatment for childhood illnesses. Additionally, women with more years of education are more inclined to embrace modern medical practices. Furthermore, research has found a clear connection between a mother's education, her socioeconomic status, and the nutritional health of her children, as educated women are more likely to have stable, higher-paying jobs, marry men

with higher education and incomes, and reside in more favourable neighbourhoods, all of which can significantly impact their children's health and survival(Abuya et al., 2012).

2.5.2 Maternal Employment and Child Nutritional Status

In the context of global urbanization, the growing financial strain on households has led to an increasing number of mothers seeking employment to support their families. Consequently, there has been a notable rise in the involvement of mothers in the workforce. It is essential to recognize that a mother's employment status significantly influences child feeding practices, thereby serving as an indicator of a child's nutrition status, as children's dietary intake is predominantly associated with their mothers. Research findings indicate that maternal employment can have an adverse impact on a child's nutrition. Effective childcare practices play a vital role in ensuring child health and nutrition (Aguree et al., 2015). A child's nutritional well-being can be substantially enhanced through proper childcare and feeding practices. However, the increased participation of mothers in the workforce may result in decreased time available for childcare, including ensuring optimal nutrition for their children, despite an increase in household income. It is worth emphasizing that an enhancement of childcare and feeding practices could yield positive effects on children's nutritional well-being. Studies investigating the link between maternal employment and child nutrition have yielded inconclusive results (Aguree et al., 2015).

2.6 Outcomes of Health-Seeking Behaviour and Child Nutritional Status

The utilization of child health services effectively reduces the risk of child morbidity and mortality, particularly in areas with low uptake of these services. Interventions aimed at promoting healthcare-seeking behaviour can potentially decrease child mortality rates and improve the nutritional status of children under five, but numerous children in developing countries die or suffer from malnutrition because illnesses are not discovered in time for appropriate treatment by health practitioners(Akter, 2022).

2.7 Care Practices for Children Under Five

2.7.1 Breastfeeding

The United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) advise initiating breastfeeding within the first hour of the baby's birth, continuing to breastfeed for up to two years or longer, and introducing safe and nutritious complementary foods at around six months. Breast milk contains all the necessary infant nutrients, including fats, carbohydrates, proteins, vitamins, minerals, and water, in the correct proportions. Additionally, breast milk contains bioactive substances like epidermal growth factor, which strengthens the baby's developing immune system and guards against infections, while also promoting the maturation of the infant's intestinal lining for better nutrient absorption. Additionally, breast milk's anti-infective properties, including immunoglobulin, help prevent bacteria from entering the cells. Furthermore, proteins like lysozyme and lactoferrin found in breast milk have antimicrobial effects, and oligosaccharides in breast milk help prevent bacteria from attaching to mucosal surfaces. (Aktar, 2021).

2.7.2 Global Perspective of Exclusive Breastfeeding

Worldwide, only 43% of babies under six months old are exclusively breastfed, as the World Health Organization (WHO) advises. This falls below the desired prevalence of exclusive breastfeeding in many countries. WHO advises exclusively breastfeeding infants for the first six months, meaning they should only receive breastmilk and no other liquids or semi-solids, except under specific medical circumstances. In low- and middle-income countries, more than 68 million children born each year are not exclusively breastfed. Many of these children are given water, formula milk, or complementary foods alongside breast milk, which can lead to infections, particularly in unhygienic settings. Promoting exclusive breastfeeding for the first six months is crucial for a child's health and development. According to the Global Nutrition Report, 47 countries are making noteworthy progress toward achieving the breastfeeding

target. While regions such as South Asia and Eastern and Southern Africa have seen improvements in exclusive breastfeeding rates since 2000, it is vital to maintain this progress in low-income countries where rates still fall short of the targets. Additionally, enhancing awareness and support for breastfeeding in high-income countries, where rates are similarly low can help foster a global culture that prioritizes children's health and well-being. By collaborating on these initiatives, breastfeeding practices and a healthier future for all children can be assured. Enhancing breastfeeding practices is crucial as it could prevent the deaths of over 800,000 children under five, the majority of whom are under six months old (Aktar, 2021).

2.7.3 Immunization and Child Health

Child immunization status is just as crucial as a child's nutritional status. Numerous studies have demonstrated that a child's immunization and nutritional well-being are closely tied to their parents' socioeconomic status. Immunization is a pivotal factor in preventing childhood diseases and mortality, and it plays a significant role in reducing global child mortality rates. Vaccines not only strengthen the immune system but also enhance the overall health and nutrition of every child. Moreover, paternal education significantly influences a child's health status. Research has identified various factors contributing to the subpar immunization status of children in developing countries, such as lack of knowledge about vaccine-preventable diseases, the significance of immunization, and the recommended age for commencing and completing immunization (Banerjee et al., 2021).

2.8 Nutrition Situation in Liberia

In recent years, the proportion of the global population suffering from hunger has decreased from one-fifth to one-sixth, and the total number of hungry individuals has also slightly declined. Despite this progress, over 852 million people still endure chronic or acute malnutrition. Although most of these individuals are situated in Asia, particularly in India and China, these regions have shown signs of improvement. Regrettably, sub-Saharan Africa is

home to 204 million malnourished children, making it the only region where both general undernourishment and children's underweight status are on the rise. If current trends continue, this region is not only at risk of failing to achieve the Hunger Goal but also likely to see an increase in the number of hungry individuals (Peterson, 2013).

In Liberia, many households face food insecurity, particularly those in poor rural areas with informal livelihoods. The highest rates of food insecurity are in Bomi (55 percent), Grand Kru (46 percent), and River Cess (45 percent) counties. Over the past six years, rates of chronic and acute undernutrition have decreased, but nearly one-third of children under the age of five are still stunted, and there are widespread micronutrient deficiencies. Stunting affects 42 percent of children aged 36–47 months, with a higher prevalence in males (34 percent) than females (29 percent). There are regional differences in stunting, with a lower rate of 27 percent in Greater Monrovia compared to 33 percent in other urban or rural areas. There are significant variations between counties in underweight children, with only 9 percent in Montserrado being underweight compared to 25 percent in River Gee. Although the rate of exclusive breastfeeding has improved over the last six years, only slightly over half of infants are exclusively breastfed. Poor dietary diversity and diarrheal disease due to inadequate hygiene and sanitation also contribute to poor nutritional outcomes. Malaria remains a significant public health issue, with 45 percent of children testing positive, and it is a major cause of anaemia in children under five years old (Nations et al., 2013).

2.8.1 Research Gap

The existing body of literature on the association between health-seeking behaviour and the health outcomes of children under five has yielded diverse findings. Some studies have identified a significant association between a mother or caregiver's education and a child's health, while others have found no substantial effect. A survey of the literature indicates that the importance of the connections between the nutritional condition of children and the

demographic and socioeconomic traits of mothers differs from nation to nation. This makes it challenging to generalize findings from one location to all others, emphasizing the need to address research gaps for country-specific reasons. Despite extensive research on the nutritional status of children under five globally and in sub-Saharan Africa, limited or no studies have examined the link between health-seeking behaviour and the nutritional status of children under five in Liberia. Other studies, such as those on maternal characteristics and child nutritional status in Liberia, have contributed to the existing literature. Therefore, this study aims to investigate how health-seeking behaviour influences the nutritional level of under five children in Liberia and to contribute to the existing body of literature.

2.8.2 Theoretical Approach

The model used in this study is "Anderson's Model", which was developed in 1968 by a renowned US medical sociologist and health services researcher, Ronald M. Andersen. This model examines the relationship between mothers' health-seeking behaviour (whether they sought treatment for a child's fever or cough) and children's nutritional status (measured by stunting). Andersen's Behavioural Model is a well-established framework specifically designed to explain health service utilization.

While it is true that several theories (such as the Health Belief Model or the Social-Ecological Model) could explain individual or community-level health behaviours, Andersen's Behavioural Model remains appropriate and relevant for this study because it focuses on health service utilization and explains how predisposing, enabling, and need factors jointly determine whether a mother seeks healthcare for her child, which directly influences the child's nutritional status. The model has been employed in many systematic reviews to structure results in the realm of healthcare utilization (Akter, 2022).

Various factors under the three main components of the behavioural model were considered, including predisposing factors such as maternal education, age, marital status, occupation, place of residence, religion, wealth status, care practices, sex, and age of the child. Enabling factors involved the availability of healthcare centers and types of healthcare facilities, while need factors encompassed the duration of illness before treatment.

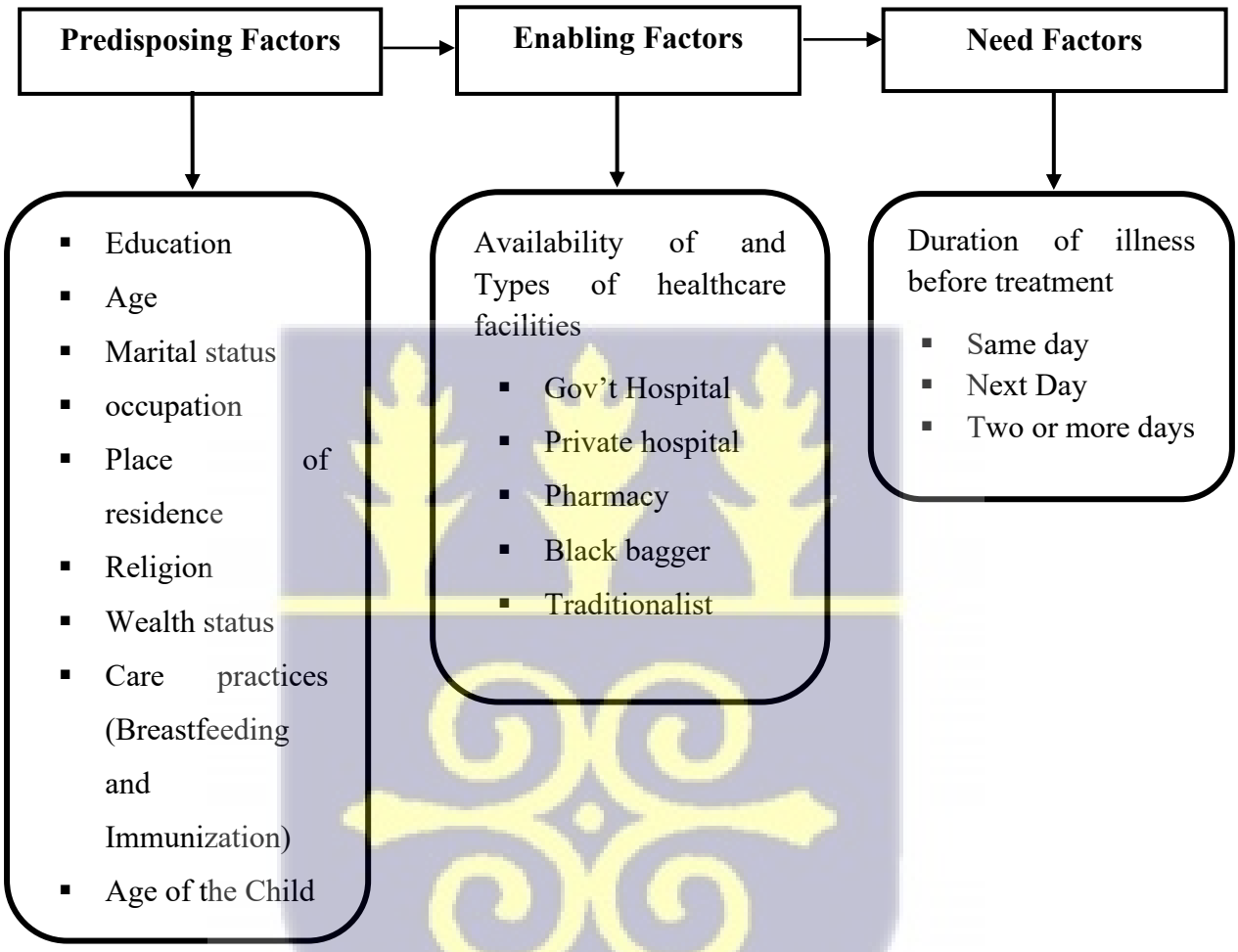

Figure 2.1: Theoretical Framework Based on Andersen's Behavioural Model

Source: Researcher's construct, 2024

2.8.3 Conceptual Framework

Guided by Andersen's Behavioural Model, this study assumes that a mother's decision to seek healthcare for her child (health-seeking behaviour) is influenced by predisposing factors (education, marital status, religion, occupation), enabling factors (wealth status, place of

residence, access to health facilities), and need factors (child's illness). These behaviors then influence the child's nutritional status, measured through height-for-age Z-scores. For example, mothers with higher education and income (predisposing and enabling factors) are more likely to seek treatment promptly when their children are sick, reducing the risk of prolonged illness and stunting. Conversely, limited resources or cultural beliefs may delay care-seeking, which can contribute to poor nutritional outcomes.

This study seeks to explore the relationship between healthcare-seeking behaviour and child nutritional status in Liberia. Adapting the behavioural model of Andersen (1968), the study separates the healthcare-seeking behaviour as an independent variable alongside other predisposing variables as control variables. Demographic factors like age, sex, and marital status are part of the predisposing component. Social structure factors like education, occupation, and religion are part of the predisposing component, as are the kinds of healthcare facilities that people choose when their child becomes ill. Due to the nature of the study, some variables mentioned in the Andersen Behavioural Model (1968) could not be utilized in the study. Variables such as mother's decision-making power, types of family, information on children under five mortality, and number of children alive. Furthermore, because the survey did not include any questions, factors including opinions toward health systems, the cost, and the accessibility of healthcare could not be examined using the LDHS data.

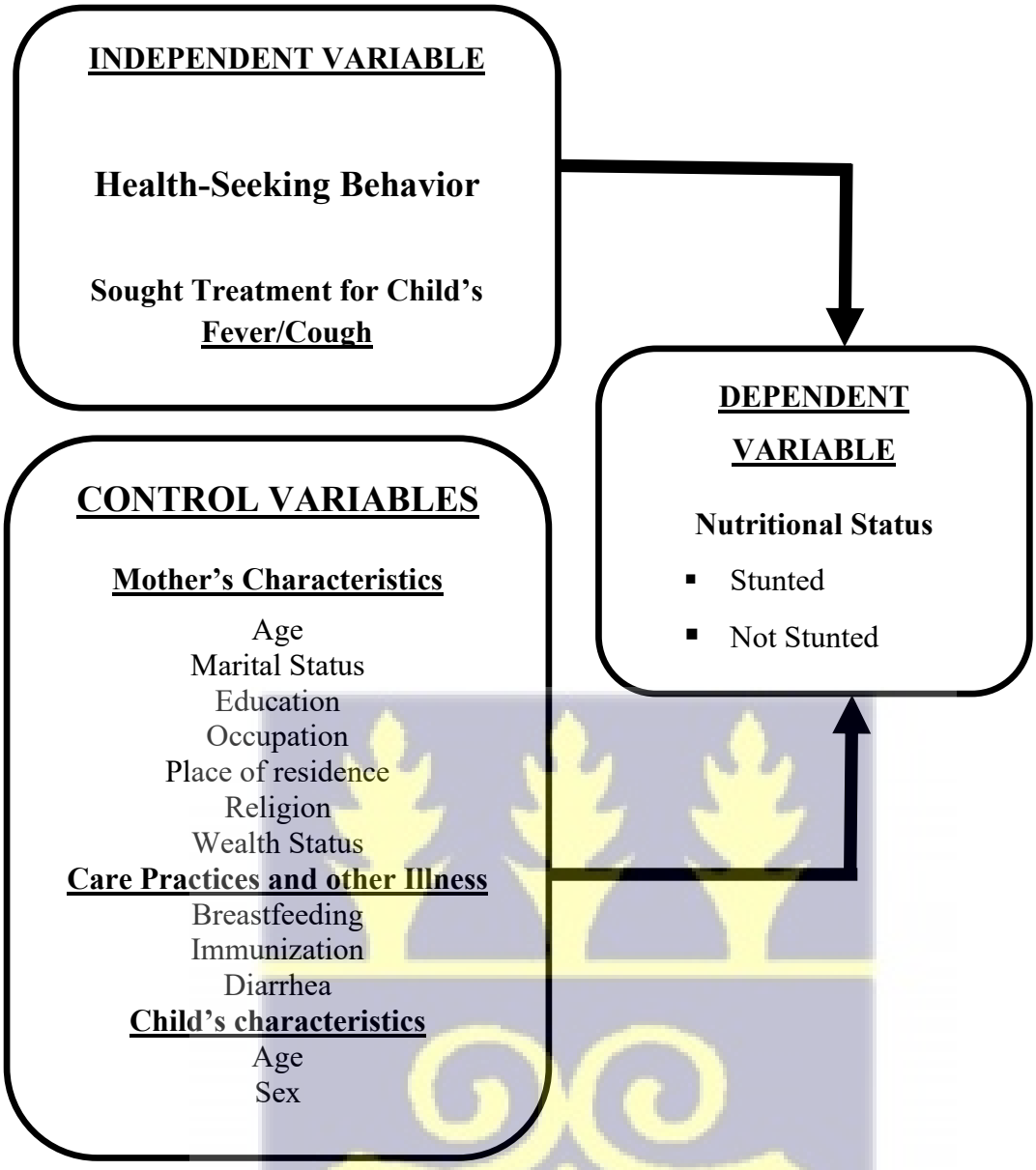

Figure 2.2: Conceptual framework showing the relationship between health-seeking behaviour and nutritional status of children under five

Source: Researcher's Construct, 2024

2.8.4 Hypotheses

The following are the proposed hypotheses based on the theorical framework and literature review:

1. Children of mothers/caregivers who seek treatment for childhood illnesses, such as fever or cough children are less likely to be stunted compared to children whose mothers do not seek treatment.
2. Children whose mothers/caregivers belong to the richest wealth quintile are less likely to be stunted compared to children whose mothers are in the poorest wealth quintile

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

This chapter systematically presents the research design and methodology utilized in the study. It commences with a comprehensive overview of the study area, followed by an examination of data sources, sample selection and design, and the categorization of variables. Furthermore, it delineates the analytical methods employed and addresses the limitations inherent to the data.

3.2 Study Setting / Area

The study was conducted in the Republic of Liberia, a nation situated on the west coast of Africa. Liberia shares its borders with three countries: Sierra Leone to the northwest, Guinea to the north, and Côte d'Ivoire to the east. Liberia's recent national population and housing census reported approximately 5.2 million people (LISGIS, 2022). The country is subdivided into fifteen counties with nine political districts. The median age in Liberia **is** 18.6 years**,** indicating a youthful population according to the Liberia Institute of Statistics Geo Information Services. A significant portion of the population resides in urban centers like Monrovia, but rural communities remain underserved. The population is nearly evenly split between males and females. Liberia is classified as a low-income economy, with a GDP of $5.17 billion (nominal) and a GDP per capita of $907 (LISGIS, 2024). The economy is agrarian, with agriculture contributing 34% to GDP, followed by services (52.2%) and industry (13.8%) respectively.

3.3 Source of Data

The Liberia Demographic and Health Survey results for 2019–2020 serve as the primary data source for this study. The LDHS is a nationally representative survey that collected socioeconomic, health, and demographic data on children under five years old and men and women in their reproductive years. The survey's main goals were to gather, examine, and share data on socioeconomic, educational attainment, nutrition, family planning, maternal and child health, child mortality, indicators of women's empowerment, and knowledge and practices surrounding HIV/AIDS and STIs.

3.4 Sample Selection and Design

The data for this study were obtained from the 2019–2020 Liberia Demographic and Health Survey (LDHS), conducted by the Liberia Institute of Statistics and Geo-Information Services (LISGIS). The LDHS used a two-stage stratified sampling design to ensure representation across all fifteen counties of Liberia, including both urban and rural areas. In the first stage, 325 Enumeration Areas (EAs) were selected from a national sampling frame based on the 2008 Population and Housing Census, employing a probability proportional to size (PPS) technique.

Each of the fifteen counties was divided into urban and rural strata, resulting in 30 total strata. In the second stage, systematic sampling was used to select 25 to 30 households from each EA. The total sample frame was 5,704 women of reproductive age (15–49 years). However, only women who had at least one child under five years of age were eligible for this study. When the dataset was filtered based on this eligibility criterion, 2,566 women with children under five were selected as the analytical sample size. Sampling weights provided by the LDHS dataset were applied in the analysis to adjust for unequal selection probabilities and non-response, ensuring the findings are nationally representative of women with children under five in Liberia.

3.5 Measurement of Variables

This section describes the variables used in the study and how they were measured.

3.5.1 Dependent Variable

The dependent variable in this study is "child nutritional status." The child nutritional status, measured by height-for-age Z-score (HAZ), was classified according to WHO standards. Children with a HAZ of less than -2 standard deviations (SD) were considered stunted, while those with a HAZ of -2 SD or greater were not stunted. Mothers' health-seeking behaviour was assessed by whether they sought treatment for fever or cough within two weeks prior to the survey. Mothers who sought treatment were coded as 1 (yes), and those who did not were coded as 0 (no). Fever and cough were chosen as indicators of health-seeking behaviour based on the DHS framework, as these are commonly reported childhood illnesses. Other factors like diarrhea, water and sanitation (WASH), cost, and distance to facilities were not included since they fell outside the study's objectives and could complicate the model.

3.5.2 Independent Variable

The independent variable used for this study is "health-seeking behaviour". Health-seeking behaviour was measured using mother's responses to seeking treatment for childhood illness.

The question asked in the study is "Sought medical treatment for fever/cough? The responses were categorized as '0 = No and 1 = Yes'.

3.5.3 Control Variables

To understand the relationship between health-seeking behaviour and child nutritional status, some demographic and socioeconomic variables were considered to show the link between the dependent variable and the independent variables. The characteristics of mother or caregiver's such as age, marital status, occupation, place of residence, religion, wealth status care practices, diarrhoea, and child characteristics such as age and sex were considered as part of the control variables in the model.

Table 3.1 below shows how the control variables used in the study were measured. For this study, some variables were re-categorized. Religion was recoded into three groups: Christianity, Islam, and Traditional or Non-religion. Outcomes of some variables were recoded because their individual sample sizes are small compared to the others. In this study, Mothers or caregivers' marital status was recoded into never married, married/cohabitating, and previously married. Respondents who had never entered into any union at the time of the study were classified as "never married." Those who were either legally married or cohabiting with a partner were designated as "currently married." Individuals who were widowed, divorced, no longer cohabiting, or separated were categorized as "previously married." The classification of working status was also revised and included the following categories: "Did not work," "Professional/Technical/Management/Clerical," "Sales/Services," "Agricultural," and "Domestic/Manual." This re-categorization adhered to a proportional-to-size selection procedure, ensuring a systematic approach to data classification. Moreover, the outcomes of some of those variables were recoded because their individual sample sizes are small compared to the others. The other variables used in this study remained as they were measured in the LDHS data set.

Table 3.1: Measurement of Variables

Independent Variable	
Variables	**Measurement**
Health-seeking Behavior	Sought Treatment for child illness (Fever/Cough) YES/NO
Dependent Variable	
Nutritional Status	Stunted Not Stunted
Control Variables	
Mother or caregiver's age	Mother's age is measured as 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, and 45 – 49
Marital Status	Never in union, married/cohabitating, and previously married
Educational Level	Educational level is categorized as No education, Primary, Secondary, and Higher
Occupation	Did not work, Professional/Technical/Management/clerical, Sales/Services, Agricultural, Domestic/Manual
Wealth Index	Wealth index categorized as Poorest, Poorer, Middle, Richer, and Richest
Type of place of residence	Rural or Urban
Religion	Christian, Muslim, Traditional religion, and No religion
Care Practices	Breastfeeding and Immunizations
Other illness	Diarrhea
Child age	Age in years categorized as 0, 1, 2, 3 and 4
Child sex	Male or Female

3.6 Data Analysis

In this study, descriptive and inferential analysis was performed using STATA Version 17. Univariate analysis was performed to show the proportions of respondents with various characteristics. The bivariate analysis was carried out to evaluate the factors associated with the outcome variable (child nutritional status). The independent variable (health-seeking behaviour), demographic, and socio-economic characteristics of respondents were cross-

tabulated against the dependent variable and the significance of the association was determined at an alpha value of $p< 0.05$. Binary regression analysis was used to determine the relationship between the health seeking behaviour and stunting. Demographic and socio-economic characteristics that were independently associated with stunting were controlled for in the final regression model. The results were reported using odds ratios at a statistical significance of 0.05.

3.7 Limitations of the study

This study provides insights into the relationship between maternal health-seeking behaviours and child nutritional status in Liberia, but it has limitations. The reliance on secondary data from the 2019–2020 Liberia Demographic and Health Survey (LDHS) means that important factors, such as cultural beliefs and healthcare quality, were not included, limiting the analysis. Recall bias and inaccuracies in self-reporting may have affected the reliability of responses about breastfeeding and healthcare-seeking behaviours. Additionally, the cross-sectional nature of the LDHS data means that observed relationships are associations rather than causal effects. Longitudinal studies would be needed for a clearer understanding. Unmeasured confounding factors, such as environmental conditions and food insecurity, may also have influenced the outcomes. Despite these limitations, the study highlights significant associations between maternal behaviour, socioeconomic status, and child health outcomes, which is valuable for policy formulation and targeted interventions in Liberia.

CHAPTER FOUR

RESULTS

4.0 Introduction

The results section presents findings on the prevalence of stunting and examines its associations with various factors, including healthcare-seeking behaviours for childhood illnesses, household wealth status, and sociodemographic characteristics among children under five years in Liberia. Using data from the 2019/2020 Liberia Demographic and Health Survey (LDHS), these analyses provide insights into stunting patterns and their potential determinants. The results explore both bivariate and multivariate associations, focusing on how factors such as treatment-seeking behaviours, breastfeeding status, household socioeconomic status, and maternal education influence stunting outcomes. By addressing these variables, the results offer a comprehensive perspective on how social, economic, and behavioural elements intersect to impact child health and growth outcomes in Liberia.

4.1 Prevalence of stunting among under five children in Liberia

Figure 4.1 presents the prevalence of stunting among children under the age of five. The data reveal that the majority of children (75.9%) exhibit normal growth, while a significant proportion (24.1%) are classified as stunted, indicating impaired growth and development.

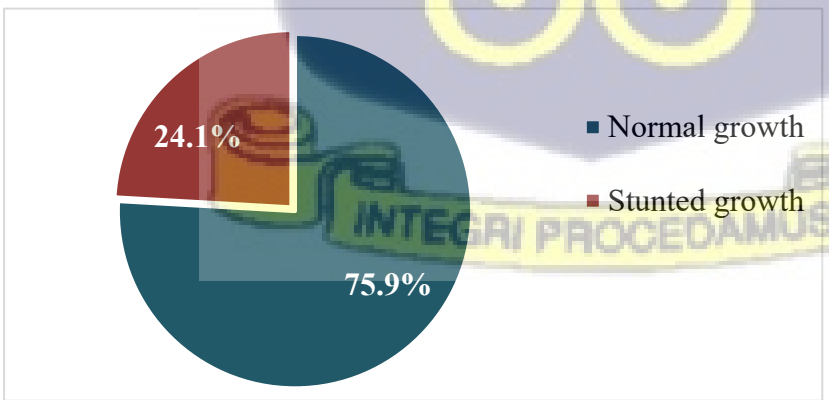

Figure 4.1: Prevalence of stunting among children under the age of five

4.2 Socioeconomic and demographic characteristics of children under five and their mothers

Children's characteristics

Table 4.1 presents the background characteristics of children under five who participated in the study. The findings indicate that approximately 22% of the children were aged 24 to 35 months. This was followed by 20% of the children aged 12 to 23 months and 18% aged 36 to 47 months. Children under 12 months represented around 16% of the sample, while those aged 48 to 59 months comprised 24%. In terms of breastfeeding status, the analysis reveals that about 61% of the children were currently being breastfed, whereas 39% were no longer breastfeeding at the time of the survey. The sex distribution of the sample is almost evenly split, with 49.4% of the children being male and 50.6% female, ensuring that the findings are not biased by gender and represent both sexes equally.

The table also reports the prevalence of fever, with 69.9% of children not experiencing fever, while 30.1% had experienced fever, indicating that this symptom, often associated with childhood illness, affected nearly one-third of the sample. In terms of childhood illness, 19.57% of the children suffered diarrhoea prior to the study, while slightly above half (52.4%) of the mothers sought medical treatment for child's fever or cough. This variability in healthcare-seeking patterns suggests potential barriers to timely medical care, which may have implications for managing childhood illnesses. Regarding immunization status, 82.1% of the children were immunized, while 17.9% had not received vaccinations. While the high rate of immunization reflects successful implementation of vaccination programs, the percentage of unvaccinated children highlights gaps in coverage that warrant attention.

Table 4.1: Characteristics of the Children

Breastfeeding status	Frequency	Percentages
Not been breastfed	1,494	58.3
Still breastfeeding	1,072	41.8
Child Sex		
Male	1,267	49.4
Female	1,299	50.6
Fever		
No	1,791	69.9
Yes	770	30.1
Diarrhoea		
No	2,059	80.43
Yes	501	19.57
Sought medical treatment for cough/fever		
No	426	47.6
Yes	469	52.4
Immunization Status		
No	96	17.9
Yes	441	82.1
Total	**2,566**	**100**

Mothers' Characteristics

Age groups of mothers of children

Table 4.2 presents the age distribution of mothers of children under five years. This distribution indicates that the majority of mothers were in their twenties and thirties, with fewer younger and older mothers represented in the population. The largest age group was 20-24 years, comprising 23.5% of the mothers, followed by 25-29 years (21.9%) and 30-34 years (17.0%). The youngest age group, 15-19 years, accounted for 9.6% of the mothers, while 16.6% fell within the 35-39 age range. The older age groups, 40-44 and 45-49, represented 8.5% and 2.8% of the mothers, respectively.

Table 4.2: Age groups of mothers of children under five years

Mothers' age groups, years	Frequency	Percentage
15-19	247	9.6
20-24	603	23.5
25-29	563	21.9
30-34	437	17.0
35-39	427	16.6
40-44	218	8.5
45-49	71	2.8
Total	**2,566**	**100**

Source: LDHS, 2019/2020

Religious affiliation of mothers of children

Table 4.3 provides the religious affiliation of mothers of children under five years. The majority of the mothers (85.2%) identified as Christian, followed by 13.0% who were Muslim. A small proportion of mothers (1.9%) practiced traditional religions or had no religious affiliation.

Table 4.3: Religious affiliation of mothers of children under five years

Religion	Frequency	Percentage
Christian	2,185	85.2
Muslim	333	13.0
Traditional / No religion	48	1.9
Total	**2,566**	**100**

Source: LDHS, 2019/2020

Marital Status

Table 4.4 presents the marital status of the mothers of children in the study. The majority of mothers (71.4%) were either married or cohabiting with their partner, while 19.1% had never been in a union. A smaller proportion, 9.6%, had been previously married (separated, divorced or widowed).

Table 4.4: Marital status of mothers of children

Marital Status	Frequency	Percentages
Never in union	489	19.1
Married/Cohabiting	1,832	71.4
Previously married	245	9.6
Total	2,566	100

Source: LDHS, 2019/2020

Educational Levels of Mothers

Table 4.5 outlines the educational levels of the mothers in the study population. These figures indicate that the majority of mothers had low educational attainment, with nearly half lacking any formal education. A significant proportion of mothers (43.0%) had no formal education, while 30.0% had attained primary education. Secondary education was completed by 25.3% of the mothers, and only 1.8% had received higher education. The relatively small percentage of mothers with higher education highlights a potential barrier to accessing better economic and health opportunities for both the mothers and their families.

Table 4.5: Educational levels of mothers

Educational levels	Frequency	Percentages
No education	1,103	43.0
Primary	769	30.0
Secondary	649	25.3
Higher	45	1.8
Total	**2,566**	**100**

Source: LDHS, 2019/2020

Occupation

Table 4.6 presents the distribution of mothers' occupations in the study population. This distribution shows that agricultural and sales/service roles dominate, with limited participation in professional or technical fields. The largest proportion of mothers (40.6%) were engaged in agricultural work, reflecting a rural or agrarian economic structure. A further 30.2% were employed in Professional, technical, managerial, clerical roles or worked as other services providers, and other Service providers, while 27.7% of mothers reported they were not working. The smallest, 1.4% were involved in manual labour or employed in household as domestic workers. The high percentage of non-working mothers also suggests socio-economic factors that may influence the workforce participation of women in this population.

Table 4.6: Occupation of Mothers

Occupation	Frequency	Percentages
Did not work	710	27.7
Professional/tech/Manag/clerical/Sales/Services	775	30.2
Agricultural	1,041	40.6
Domestic/Manual	37	1.4
Total	**2,566**	**100**

Source: LDHS, 2019/2020

Wealth Quintiles of mothers

Table 4.7 provides the distribution of mothers across different wealth quintiles. The data highlights economic disparities within the population, with a relatively small percentage of mothers in the higher wealth quintiles. The largest proportion of mothers (33.5%) falls into the poorest quintile, followed by 27.6% in the poorer quintile. The middle quintile accounts for 19.8% of mothers, while 11.7% and 7.4% are classified as richer and richest, respectively. This

distribution indicates that a significant portion of the study population comes from lower wealth categories, with over 60% of the mothers being in the poorest and poorer quintiles.

Table 4.7: Wealth quintiles of mothers

Wealth quintiles	Frequency	Percentages
Poorest	859	33.5
Poorer	709	27.6
Middle	509	19.8
Richer	300	11.7
Richest	189	7.4
Total	**2,566**	**100**

Source: LDHS, 2019/2020

Place of residence and types of health facilities

Table 4.8 summarizes the place of residence of the study children. This suggests that 67.2% of the children resided in rural areas while 32.8% resided in urban areas.

Table 4.8: Place of residence

Place of residence	Frequency	Percentages
Urban	842	32.8
Rural	1,724	67.2
Total	**2,566**	**100**

4.3 Prevalence of Stunting and Bivariate Analysis of the Relationship Between Child and Maternal Characteristics with Stunting

Table 4.9 presents the prevalence of stunting among children under five years of age, alongside the results of univariate analyses examining the associations between various child and maternal characteristics and stunting. The overall prevalence of stunting is 24.1%, indicating

impaired growth, while 75.9% of children exhibit normal growth. Breastfeeding status demonstrates a significant association with stunting ($p < 0.001$), with children who are still breastfeeding showing the lowest prevalence (18.6%) compared to those who are not currently breastfeeding (28.0%) or those who have never breastfed (30.0%), suggesting a protective role of breastfeeding. Gender differences in stunting prevalence are minimal and not statistically significant, with females exhibiting a prevalence of 24.6% and males 23.6% ($p = 0.570$). The presence of fever does not influence stunting (24.2% vs. 24.1%, $p = 0.985$), while a history of diarrhoea is significantly associated with a higher prevalence of stunting (27.7% vs. 23.3%, $p = 0.042$). Immunisation status lacks a significant association, with stunting rates of 24.3% among immunised children and 21.9% among non-immunised children ($p = 0.619$). Similarly, a history of cough or fever does not affect stunting prevalence, which remains identical at 23.5% for children with and without a history of these illnesses ($p = 0.994$).

Among maternal characteristics, age demonstrates a significant association with stunting ($p = 0.030$), with the highest prevalence observed among children of mothers aged 20–24 years (29.7%), while other age groups show prevalence rates ranging from 21% to 24%. Educational attainment is significantly linked to stunting ($p = 0.008$), with children of mothers with no formal education exhibiting a prevalence of 25.8%, which declines progressively with higher maternal education, reaching 6.7% among children of mothers with higher education. Wealth status is strongly associated with stunting ($p < 0.001$), with the highest rates found among children from the poorest households (29.2%) and the lowest rates (11.6%) among those from the wealthiest households. Place of residence is also significant ($p = 0.001$), with stunting prevalence higher in rural areas (26.0%) compared to urban regions (20.2%).

Marital status and religious affiliation do not show significant associations with the prevalence of stunting; however, children of never married or previously married mothers exhibit slightly higher rates (26.2% and 26.1%, respectively) compared to those of married mothers (23.3%).

Furthermore, mothers practicing traditional religions or lacking any religious affiliation demonstrate higher stunting rates (33.3% and 36.7%, respectively) compared to Christian (24.1%) and Muslim (22.2%) mothers, although this association is not statistically significant ($p = 0.254$). Additionally, maternal occupation is significantly linked to stunting ($p = 0.010$), with the highest prevalence observed among children of mothers engaged in agricultural work (27.6%) and lower prevalence among those of mothers involved in domestic or manual labor (16.2%). These findings highlight the complex influences of both child and maternal characteristics on stunting, with significant associations found for breastfeeding status, maternal education, wealth, maternal age, and place of residence.

Table 4.9: Bivariate Analysis of the Relationship Between Child and Maternal Characteristics and Stunting

Variable name	Stunted growth	Normal growth	P-value (X^2)
Prevalence of stunting	24.10	75.90	-
Breastfeeding status			
Not currently breastfeeding	27.99	72.01	0.000 (30.7784)
Never breastfed	30.00	70.00	
Still breastfeeding	18.56	81.44	
Child sex			
Male	23.6	76.4	0.570 (0.3222)
Female	24.56	75.44	
Fever			
No	24.12	75.88	0.985 (0.0004)
Yes	24.16	75.84	
Diarrhoea			
No	23.26	76.74	0.042 (6.3328)
Yes	27.74	72.26	
Immunization status			
No	21.88	78.13	0.619 (0.2476)
Yes	24.26	75.74	
History of cough/fever			
No	23.47	76.53	0.994 (0.000)
Yes	23.45	76.55	
Mothers' age groups			
15-19	21.46	78.54	0.030 (13.936)
20-24	29.68	70.32	
25-29	22.20	77.80	

30-34	21.97	78.03	
35-39	23.19	76.81	
40-44	22.48	77.52	
45-49	23.94	76.06	
Religion			
Christian	24.12	75.88	
Muslim	22.22	77.78	0.254
Traditional religion	33.33	66.67	(4.0728)
No religion	36.67	63.33	
Marital status			
Never in union	26.18	73.82	
Married/cohabiting	23.25	76.75	0.298
Previously married	26.12	73.88	(2.4186)
Educational levels			
No education	25.84	74.16	
Primary	24.71	75.29	0.008
Secondary	21.57	78.43	(11.7276)
Higher	6.67	93.33	
Occupation			
Did not work	21.69	78.31	
Professional/tech/Manag/clerical	16.22	83.78	0.010
Sales/Services	22.09	77.91	(13.2737)
Agricultural	27.57	72.43	
Domestic/Manuel	16.22	83.78	
Wealth quintiles			
Poorest	29.22	70.78	
Poorer	24.40	75.60	0.000
Middle	22.00	78.00	(32.380)
Richer	20.00	80.00	
Richest	11.64	88.36	
Place of residence			
Urban	20.19	79.81	0.001
Rural	25.99	74.01	(10.394)

4.4 Multivariate Analysis of the Association of Stunting with seeking treatment and household wealth status among children under five years of age

The multivariate analysis presented in Table 4.10 investigates the associations between stunting and various factors, including treatment-seeking behaviour, breastfeeding practices, household wealth status, place of residence, educational attainment, and maternal age among children under five years old. The analysis revealed that seeking treatment for cough or fever did not demonstrate a significant association with stunting in either the crude (COR = 0.99, p

= 0.994) or adjusted models (AOR = 1.11, p = 0.512). In contrast, children who were still being breastfed exhibited a significantly lower likelihood of stunting in both the crude (COR = 0.59, p < 0.001) and adjusted analyses (AOR = 0.68, p = 0.024) when compared to those who were not breastfed. Initial findings suggested that children from rural areas had an AOR = 1.73 (p < 0.01) for stunting compared to those in urban areas, implying they were 73% more likely to be stunted, highlighting the persistent urban–rural nutritional gap in Liberia. The study found that wealth status was a significant determinant of stunting. Children from the richest households had an AOR = 0.13 (p = 0.002) compared to those from the poorest households**.** This means that children from the richest households were 87% less likely (1 – 0.13 = 0.87) to be stunted compared to children from the poorest households, holding all other variables constant. Maternal education initially appeared to provide a protective effect. The study found that children of mothers with secondary or higher education had an AOR = 0.42 (p < 0.05) compared to those whose mothers had no formal education. This suggests that these children were 58% less likely to be stunted. Maternal age exhibited a minimal association with stunting; while the 20–24 age group initially demonstrated higher odds of stunting (COR = 1.55, p = 0.015), this association was rendered non-significant after adjustment. Similarly, children with a history of diarrhoea had higher odds of stunting (COR = 1.27, p = 0.036), but the association was non-significant in the adjusted model. Children of mothers engaged in the agricultural sector (COR = 1.37, p = 0.005) had 37% higher odds of stunting compared to children of mothers who did not work. Overall, breastfeeding status and wealth emerged as the most significant factors associated with stunting outcomes.

Table 4.10: Multivariate Analysis of the Association of Stunting with seeking treatment and household wealth status among children under five years of age

Variables	COR	95% C. I.	P-value	AOR	95% C. I.	P-value
Sought Treatment for cough/fever						
No = Ref	1.00			1.00		
Yes	0.99	(0.73, 1.36)	0.994	1.11	(0.81, 1.54)	0.512
Breastfeeding status						
Not Breastfeeding = Ref	1.00			1.00		
Still Breastfeeding	0.59	(0.48, 0.71)	0.000	0.68	(0.49, 0.95)	0.024
Place of residence						
Urban = Ref	1.00			1.00		
Rural	1.39	(1.14, 1.69)	0.001	0.87	(0.57, 1.34)	0.531
Wealth status						
Poorest = Ref	1.00			1.00		
Poorer	0.78	(0.62, 0.98)	0.033	0.64	(0.42, 0.96)	0.032
Middle	0.68	(0.53, 0.88)	0.004	0.94	(0.58, 1.53)	0.795
Richer	0.61	(0.44, 0.83)	0.002	0.91	(0.48, 1.72)	0.777
Richest	0.32	(0.20, 0.51)	0.000	0.13	(0.04, 0.47)	0.002
Educational levels						
No education = Ref	1.00			1.00		
Primary	0.94	(0.76, 1.16)	0.580	1.05	(0.71, 1.55)	0.806
Secondary	0.79	(0.63, 0.99)	0.044	0.84	(0.52, 1.35)	0.472
Higher	0.21	(0.06, 0.67)	0.008	0.65	(0.07, 5.70)	0.698
Mothers' age groups						
15-19 = Ref	1.00			1.00		
20-24	1.55	(1.09, 2.19)	0.015	1.34	(0.76, 2.38)	0.316
25-29	1.04	(0.73, 1.50)	0.814	0.82	(0.44, 1.53)	0.537
30-34	1.03	(0.71, 1.51)	0.877	0.77	(0.40, 1.48)	0.436
35-39	1.10	(0.76, 1.61)	0.605	0.74	(0.38, 1.45)	0.383
40-44	1.06	(0.68, 1.65)	0.791	0.70	(0.32, 1.53)	0.374
45-49	1.15	(0.62, 2.15)	0.656	0.83	(0.27, 2.52)	0.737
Occupation						
Did not work = Ref	1.00					
Professional/tech/Manag/clerical	0.70	(0.29. 1.71)	0.431	1.32	(0.33, 5.22)	0.690
Sales/Services	1.02	(0.80. 1.31)	0.855	1.01	(0.65, 1.57)	0.949
Agricultural	1.37	(1.10. 1.72)	0.005	1.31	(0.85, 2.02)	0.226
Domestic/Manuel	0.70	(0.29. 1.71)	0.431	0.57	(0.12, 2.63)	0.467
Diarrhoea						
No diarrhoea = Ref	1.00					
Yes	1.27	(1.02, 1.58)	0.036	1.10	(0.79, 1.55)	0.566

Stunting was used as the reference category. Both crude odds ratios (COR) and adjusted odds ratios (AOR) were calculated with 95% confidence intervals. Model statistics: LR $\chi^2(21) = 39.46$, $p = 0.009$, log-likelihood = -465.174, and pseudo-$R^2 = 0.041$.

CHAPTER FIVE

DISCUSSION OF STUDY FINDINGS

5.1 Prevalence of Stunting Among Children Under the Age of Five Years

The prevalence of stunting among children under five in Liberia, recorded at 24.1%, reflects a persistent public health issue, despite progress over the years. Stunting, an indicator of chronic malnutrition, results from long-term nutrient deficiencies and recurrent infections, particularly in vulnerable populations. This prevalence is consistent with trends observed in Sub-Saharan Africa, where socioeconomic disparities, limited access to healthcare, and inadequate maternal and child health practices contribute to elevated levels of stunting. The World Health Organization (WHO) reports an average stunting prevalence of 34% in sub-Saharan Africa, significantly higher than in East Asia and the Pacific, where rates are approximately 11% (WHO, 2024b). Although the prevalence of stunting among children under five is lower than the regional average and has improved from the 31.8% reported by the World Bank in 2011, stunting remains a considerable concern. Factors such as maternal education, household wealth, access to healthcare, and food security play pivotal roles in mitigating stunting (FAO et al., 2023; Takele et al., 2022). Regional data further indicate that countries with similar economic and healthcare constraints experience comparable challenges related to malnutrition. For example, in Eastern Africa, where stunting rates are around 30.6%, a strong association exists between higher maternal education and reduced stunting. Liberia's relatively lower prevalence of stunting compared to countries such as Burundi (54.51%) suggests some public health gains; however, stunting in rural and low-income areas remains a critical concern, underscoring the need for targeted interventions. Continued progress in Liberia may benefit from community-based nutrition education, maternal health services, and economic support programmes, which have been shown to reduce stunting across sub-Saharan Africa (Tamir et al., 2024; Mengesha et al., 2021). In conclusion, while Liberia's 24.1% stunting prevalence

indicates some improvement, it remains a public health priority. Addressing stunting will require multifaceted strategies that enhance maternal education, food security, access to healthcare, and socioeconomic equity in order to further align child health outcomes in Liberia with global nutrition targets.

5.2 Seeking Treatment for Childhood Illnesses (Fever/Cough) and the Prevalence of Stunting Among Children Under Five Years of Age

This study examined the relationship between health-seeking behaviour for common childhood illnesses, specifically fever and cough, and stunting in children under five. The results revealed no statistically significant link between seeking treatment for these illnesses and stunting, with both crude and adjusted odds ratios showing no meaningful association. This finding challenges the prevailing belief that health-seeking behaviour for common illnesses directly influences child growth, as timely treatment is often considered crucial for preventing developmental setbacks caused by illness-related complications. Similarly, research in Ethiopia observed that while health-seeking improved immediate illness outcomes, its effect on chronic malnutrition indicators like stunting remained weak (Asfaw et al., 2015). The literature strongly supports proactive health-seeking behaviour to reduce child morbidity and mortality (Wambui, 2017; Purcell et al., 2024). The World Health Organization (WHO) estimates that appropriate health-seeking actions by caregivers could decrease child mortality by up to 20% (Weldesamuel et al., 2019). Effective management of childhood illnesses, particularly in low-resource settings, relies on timely interventions. However, barriers such as limited access to healthcare facilities, financial constraints, and low caregiver awareness often delay or prevent necessary care. These delays in seeking treatment can increase the risk of complications, making later interventions less effective and potentially leading to chronic health conditions that may indirectly affect growth. The lack of a significant association in this study between treatment-seeking for fever or cough and stunting suggests that, while critical

for managing acute health risks, healthcare-seeking behaviours alone may be insufficient to address the underlying factors of stunting, such as inadequate nutrition, poverty, and low maternal education.

Globally, and especially in sub-Saharan Africa, preventable diseases remain major contributors to child mortality, often exacerbated by delayed healthcare-seeking among caregivers. For instance, in Ethiopia, low rates of healthcare-seeking for childhood illnesses persist despite improvements in healthcare access, highlighting that social and economic barriers continue to shape health outcomes (Weldesamuel et al., 2019). Other low- and middle-income countries, such as India and Mexico, report similar issues, where caregivers delay seeking healthcare for symptoms like fever and respiratory infections due to limited knowledge, competing demands, or underestimation of illness severity. In Guatemala, children whose mothers relied on home-based care suffered significantly from illnesses such as diarrhoea and fever, leading to increased morbidity and mortality rates (Aigbokhaode et al., 2015).

The elevated mortality rates among children under five years of age throughout sub-Saharan Africa, including Nigeria, further illustrate the significance of healthcare-seeking behavior in child survival. Factors such as poverty, distance to health facilities, and perceptions of illness severity are well-established barriers to timely access to healthcare (Aigbokhaode et al., 2015). Despite the recognised importance of health-seeking behaviour in addressing acute health threats, the findings of this study suggest that tackling chronic malnutrition and stunting may necessitate broader, multifactorial interventions extending beyond episodic healthcare utilisation. Stunting, as a complex manifestation of chronic malnutrition, likely necessitates a comprehensive approach that integrates enhanced food security, maternal education, and preventive healthcare services in conjunction with traditional treatment-seeking practices for illnesses.

In conclusion, while seeking healthcare for conditions such as fever and cough remains critical to reducing child mortality from preventable causes, this study illustrates that it does not exhibit a direct association with stunting among children under five years of age. The findings underscore the necessity for an integrated approach to addressing stunting, which includes addressing the underlying socioeconomic and nutritional factors alongside health education initiatives. Such a strategy is imperative for achieving sustained improvements in child growth and development, ultimately contributing to healthier, more resilient child populations in low-resource settings.

5.3 Household Wealth Status, Breastfeeding Practices and Stunting in Children Under Five Years of Age

Household wealth status emerged as a significant determinant of stunting prevalence among children in Liberia, with children from wealthier households, particularly those in the highest wealth category, demonstrating markedly lower odds of stunting. The analysis showed that children in the richest households had substantially reduced odds of stunting in both unadjusted and adjusted models compared to children from the poorest households. These findings underscore the role of economic resources in shaping child nutritional outcomes and align with a robust body of literature that links higher household income with improved child health (Swaminathan et al., 2019; Cooper& Stewart, 2021). The literature consistently indicates that household income is pivotal in determining child nutrition and growth. Wealthier households are more likely to have reliable access to nutritious food, healthcare services, and sanitary living conditions, which collectively contribute to lowering the risk of stunting (Kumeh et al., 2020). In low-income households, however, children are more vulnerable to stunting due to factors such as food insecurity, inadequate healthcare, and poor environmental conditions, all of which adversely affect growth and development. For instance, Kumeh et al. (2020) identified that in rural Liberia, mothers with an income above US$50 per month were significantly less likely to

have children with severe malnutrition, highlighting poverty as a key driver of child malnutrition in the region. Similarly, Dake et al. (2019) found that Ethiopian households with income levels below 750 ETB were at a greater risk of stunting. Their study attributed improved child nutrition and reduced stunting prevalence to increased household income, which enhanced dietary diversity and nutrient intake. These findings align with international evidence linking economic well-being with reduced child malnutrition rates. Wealthier households can invest in quality food, healthcare, and better housing, creating an environment that fosters child growth and reduces susceptibility to stunting. Conversely, lower-income households often experience chronic food insecurity and limited access to health services, which exacerbate the risk of stunting among young children (Leung et al., 2014; Penne & Goedemé, 2021). Moreover, the structural conditions associated with poverty, such as poor sanitation, lack of access to safe water, and limited health literacy, contribute to chronic health issues that may further impede child growth. The data from Liberia reflect these patterns, demonstrating that wealthier families are less likely to have stunted children, even after controlling for other potential confounders. This relationship suggests that alleviating poverty and improving household income could play a transformative role in addressing stunting and malnutrition. Income growth allows families to diversify diets, enhance nutrient intake, and access better healthcare, all of which are critical for child growth and development. Policies aimed at poverty reduction, income support, and food security could thus have a profound impact on reducing stunting rates and improving the overall health of children.

Additionally, this study found that children who were still being breastfed had significantly lower odds of stunting compared to those who were never breastfed, with both regression models supporting this association. Breastfeeding, recommended by WHO and UNICEF, provides essential nutrients, bioactive factors, and immunological benefits that support infant growth and immune function (Sánchez et al., 2021). Exclusive breastfeeding for the first six

months is linked to better health outcomes, reducing the risk of infections that can impede growth (Camacho-Morales et al., 2021). However, global exclusive breastfeeding rates remain suboptimal, with only 43% of infants under six months exclusively breastfed (Sankar et al., 2015). Given breastfeeding's protective role against stunting, promoting exclusive breastfeeding practices could help reduce malnutrition rates and improve child health outcomes, particularly in low-income settings where stunting is prevalent (Aktar, 2021).

In conclusion, this study highlights household wealth as a key factor in reducing stunting among children in Liberia. While healthcare-seeking behaviour and nutritional practices are essential, the economic resources available within a household fundamentally shape children's growth trajectories. Addressing stunting among Liberian children will likely require a multifaceted approach, prioritising income growth and poverty reduction alongside targeted health and nutrition interventions. By improving economic stability at the household level, policymakers can support healthier developmental outcomes and contribute to breaking the cycle of poverty and malnutrition in Liberia and similar contexts.

These results show that mothers' health-seeking behaviour, measured by whether they sought care for their children's illnesses, did not have a significant effect on stunting among children under five. Therefore, hypothesis one (H_1) is accepted. Since the *p*-value (0.002) is less than 0.05, hypothesis two (H_2) is rejected. This indicates that wealth status significantly affects child nutrition in Liberia. Families with higher incomes are more likely to afford diverse and nutritious foods, access healthcare services, and maintain better living conditions, all of which reduce the likelihood of chronic malnutrition among children.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Summary of key findings

This study aimed to assess the prevalence and predictors of stunting among children under five in Liberia, focusing on healthcare-seeking behaviours and household wealth status. The findings revealed an overall stunting prevalence of 24.1% among Liberian children five, indicating improvement from previous years yet highlighting persistent public health challenges. Children from wealthier households had significantly lower odds of stunting, emphasizing the crucial role of economic resources in supporting child nutrition and growth. Interestingly, no significant association was found between treatment-seeking behaviour for common illnesses, such as fever or cough, and stunting. While healthcare-seeking is vital for managing acute childhood illnesses, it appears insufficient to address the complex, long-term factors underlying chronic malnutrition. Breastfeeding practices, however, were a significant protective factor: children who were breastfed had a substantially lower likelihood of stunting, underscoring the importance of promoting breastfeeding as a core public health strategy. To reduce stunting in Liberia, integrated strategies are needed that encompass maternal education, breastfeeding promotion, and efforts to alleviate socioeconomic inequities contributing to chronic malnutrition. Such initiatives are essential to align Liberia's child health outcomes with global nutrition targets and support healthier growth trajectories.

6.2 Conclusion

This study highlights the prevalence and determinants of stunting among children under five in Liberia, revealing a stunting rate of 24.1%. Key findings indicate that higher household wealth and breastfeeding practices serve as protective factors against stunting, while treatment-seeking behaviour for common illnesses showed no significant association. Addressing stunting in Liberia may require comprehensive

strategies, including poverty alleviation initiatives and improved maternal education on the benefits of breastfeeding.

6.3 Recommendations

Based on the findings of this study, the following recommendations may assist in addressing stunting among children under five in Liberia:

1. Health agencies operating in Liberia should enhance breastfeeding education and support programs for mothers, highlighting the importance of exclusive breastfeeding for the first six months and the continuation of breastfeeding thereafter to mitigate the risk of stunting.
2. Priority should be given to community-based interventions, which include strengthening maternal education programs, promoting peer support groups for young mothers, and improving community-level nutrition awareness and care-seeking practices to enhance child health and nutritional outcomes.
3. Future research should aim to incorporate additional determinants such as Water, Sanitation, and Hygiene (WASH), accessibility to health services, and dietary diversity. This will enable the formulation of more targeted, context-specific policy guidance to effectively improve child nutrition and health outcomes in Liberia.

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Mar 25, 2024

Jonathan Mehn
University of Ghana
Ghana
Request Date: 03/25/2024

Dear Jonathan Mehn:

This is to confirm that you are approved to use the following Survey Datasets for your registered research paper titled: "Mother's Health Seeking Behaviours and Child Survival Status in Liberia ":

Liberia

To access the datasets, please login at: https://www.dhsprogram.com/data/dataset_admin/login_main.cfm. The user name is the registered email address, and the password is the one selected during registration.

The IRB-approved procedures for DHS public-use datasets do not in any way allow respondents, households, or sample communities to be identified. There are no names of individuals or household addresses in the data files. The geographic identifiers only go down to the regional level (where regions are typically very large geographical areas encompassing several states/provinces). Each enumeration area (Primary Sampling Unit) has a PSU number in the data file, but the PSU numbers do not have any labels to indicate their names or locations. In surveys that collect GIS coordinates in the field, the coordinates are only for the enumeration area (EA) as a whole, and not for individual households, and the measured coordinates are randomly displaced within a large geographic area so that specific enumeration areas cannot be identified.

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Sincerely,

Bridgette Wellington

Bridgette Wellington
Data Archivist
The Demographic and Health Surveys (DHS) Program