

UNIVERSITY FOR DEVELOPMENT STUDIES, TAMALE

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF GLOBAL AND INTERNATIONAL HEALTH



PROGRAMME: MASTER OF PUBLIC HEALTH

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INDEX NUMBER: UDS/MPH/0006/20

**ASSESSING RESPONSIVE CARE AND FEEDING PRACTICES OF
MOTHERS/CAREGIVERS AND NUTRITIONAL STATUS OF CHILDREN 6-24
MONTHS IN SAGNARIGU MUNICIPAL**

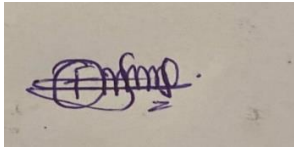
DECLARATION

I hereby declare that, apart from references from other people's research which has been duly acknowledged, this long essay is the results of my own research work under supervision and no part of this work has been presented for another degree in any institution.

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ABSTRACT

Background: Childhood under nutrition is a significant public health concern in Ghana with the Northern region mostly recording a higher prevalence. Several projects have been launched in the Northern region especially in Sagnarigu municipal where undernutrition is still unacceptably high. The purpose of this study is to investigate the responsive care and feeding practices of mothers/caregivers, and how this affects the nutritional status of children aged 6 to 24 months in Sagnarigu Municipal. **Methods:** A quantitative facility-based cross-sectional study was carried out, with structured questionnaires used for collecting data. This study employed a multistage sampling technique, with data analyzed using SPSS and WHO Anthropometry software. Bivariate and multiple logistic regression were run to see the association between independent and dependent variables. **Results:** Only 47.4% of mothers/caregivers practiced responsive care giving. About half of the children 50.4% were exclusively breastfed with 44.4% of mothers weaning their children between the ages 19-23 months. Complementary foods were timely introduced by 58.5% of mothers/caregivers to their children on the sixth month with only 33.0% of children 6-24 months meeting the minimum acceptable diet criterion. Only stunting was found to be associated with minimum dietary diversity. Children who did not meet the minimum dietary diversity were less likely to be stunted [AOR= 0.494; 95% CI (0.079, 0.808); p= 0.020]. **Conclusion:** Dietary diversity was associated with only stunting. Interestingly, aside the association between stunting and dietary diversity, there was no association between nutritional status and responsive care and the other feeding practices. **Recommendation:** Health workers should be properly trained and empowered to include counseling on responsive care practices in their work. Mothers/caregivers should be educated on the importance of exclusive breastfeeding and how locally available foods can be used to practice good complementary feeding.

ACKNOWLEDGEMENT

I am Grateful to Almighty Allah for giving me the strength and wisdom to successfully go through this master's program and a successful completion of this research work.

I wish to extend my sincere appreciation to my hardworking, caring and patient supervisor, Prof. Abdulai Abubakari, who guided me to successfully complete this research.

I will also like to extend my gratitude to all the lecturers of Master of Public Health and the entire university. Thank you for all the support and knowledge.

I will like to use this opportunity to thank my research assistants, Mrs Latifa Wunnam Mahamuda and Madam Sanatu Fuseini. Not forgetting my colleagues, thank you for the support and guidance especially to our able course Rep. Bawa, Hajia Mabrukata, Faiza, and Sham, Allah richly bless you all.

I am very grateful for my family's support and motivation.

I am extremely grateful to the Sagnarigu Municipal Health directorate for their support and understanding, and all the respondents who took part in this study. Allah richly bless you all.

DEDICATION

This work is dedicated to my parents and my family.

TABLE OF CONTENT

DECLARATION	ii
ABSTRACT.....	iii
ACKNOWLEDGEMENT.....	iv
DEDICATION	v
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
LIST OF ABBREVIATIONS	xi
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background	1
1.2 Problem statement	4
1.3 Significance of the Study.....	9
1.4 Conceptual Framework.....	11
1.5 Research questions	13
1.6 General objective	13
1.6.1 Specific objectives.....	13
CHAPTER TWO	14
LITERATURE REVIEW	14
2.2 Early Childhood Development	14
2.3 Responsive Care and Feeding	17
2.4 Infant and Young Child Feeding (IYCF).....	18
2.4.1 Early Initiation of Breastfeeding	19
2.4.2 Exclusive Breastfeeding	20
2.4.3 Complementary Feeding.....	22
2.4.4 Minimum Dietary Diversity (MDD)	23
2.4.5 Minimum Meal Frequency.....	23
2.4.6 Minimum Acceptable Diet	24
2.5 The Concept of Malnutrition.....	24
2.5.1 Prevalence of Malnutrition	25
2.5.2 Stunting.....	26
2.5.3 Wasting	27
CHAPTER THREE	28

METHODOLOGY	28
3.1 Study Area	28
3.2 Climate and Vegetation	28
3.3 Study Design.....	29
3.4 Study Population	29
3.5 Sample Size Determination	29
3.6 Sampling Technique	30
3.7 Inclusion Criteria	31
3.8 Exclusion Criteria.....	31
3.9 Dependent Variable	31
3.10 Independent Variable	31
3.11 Data Collection.....	32
3.14 Anthropometric Measurements	32
3.15 Recruitment and Training of research Assistants	33
3.16 Data Analysis	33
3.17 Ethical Consideration	34
CHAPTER FOUR	35
RESULTS	35
Introduction	35
4.1 Background and Socio-demographic Characteristics of Respondents	35
4.2 Breastfeeding practices of mothers/ caregivers.....	37
4.3 Age water/other liquids was introduced to children 6 to 24 months	39
4.3 Complementary feeding practices of mother/caregiver	40
4.4 Responsive care practices of mothers/caregivers	42
4.5 Association between responsive care and socio-demographic factors of mothers/caregiver	43
4.6 Nutritional Status of Children 6-24month	45
4.7 Association between socio-demographic characteristics and nutritional status of children 6-24 months	47
4.8 Association between Minimum Dietary Diversity, Minimum Meal Frequency and Minimum Acceptable Diet and Responsive care	53
4.9 Association between socio-demographic factors and MDD, MMF and MAD	55
4.10 Association between responsive care and feeding practices and the nutritional status of children 6-24 months in Sagnarigu Municipal	61
CHAPTER FIVE	63

DISCUSSION OF RESEARCH RESULTS	63
Introduction	63
5.1 Socio-demographic characteristics	63
5.2 Responsive care practice	64
5.3 Breastfeeding feeding practices	64
5.4 Complementary feeding practices	66
5.5 Nutritional Status of children.....	67
5.6 Association between responsive care, feeding practices of mothers/caregivers and nutritional status of children	68
CHAPTER SIX.....	69
CONCLUSION AND RECOMMENDATION	69
6.1 Summary of key findings.....	70
6.2 Conclusion.....	71
6.3 Recommendation.....	71
REFERENCE.....	74
APPENDIX I.....	83
Questionnaire	83
APPENDIX II.....	91

LIST OF TABLES

Table 1: Number of children interviewed at each facility	30
Table 2: Background and socio-demographic characteristics	36
Table 3: Breastfeeding practices of mothers/ caregivers	38
Table 4: Times when water/other liquids were introduced	39
Table 5: Complementary feeding practices of mothers/caregivers	40
Table 6: Responsive care practices of mothers/caregivers	42
Table 7: Association between responsive care and socio-demographic characteristics of mothers/caregivers	44
Table 8: Nutritional status of children 6 to 24 months in Sagnarigu Municipal	45
Table 9: Prevalence of child under nutrition (Underweight, Stunting and Wasting) by sex of child.	46
Table 10: Association between socio-demographic factors and underweight	48
Table 11: Association between mothers/caregivers characteristics and stunting	50
Table 12: Association between mothers/caregivers characteristics and wasting	52
Table 13: Association between Minimum Dietary Diversity, Minimum Meal Frequency and Minimum Acceptable Diet and Responsive care	54
Table 14: Association between socio-demographic factors and MDD	56
Table 15: Association between socio-demographic factors and MMF	58
Table 16: Association between socio-demographic factors and MAD	60
Table 17: Regression analysis to show association between responsive care and feeding practices and nutritional status (stunting) of children 6-24 months	62

LIST OF FIGURES

Figure 1: CONCEPTUAL FRAMEWORK OF CHILD SURVIVINIG AND THRIVING..... 12

LIST OF ABBREVIATIONS

AOR- Adjusted Odds Ratio

CI- Confidence Interval

ECCD- Early Childhood Care and Development

ECD- Early Child Development

GDHS- Ghana Demographic and Health Survey

GSS- Ghana Statistical Service

IYCF- Infant and Young Child Feeding Practices

LMICs- Low and Middle Income Countries

MAD- Minimum Acceptable Diet

MDD- Minimum Dietary Diversity

MMF- Minimum Meal Frequency

MDGs- Millennium Development Goals

MICS- Multiple Indicator Cluster Survey

NCF- Nurturing Care Framework

SDGs- Sustainable Development Goals

SSA- Sub-Saharan Africa

UN- United Nation

UNICEF- United Nations International Children's Fund

USAID- United States Agency for International Development

WFP- World Food Program

WHO- World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background

It is reported by the World Health Organization (WHO), that if every child under age two years is optimally breastfed, over 800,000 lives of children may be protected annually in children less than five years (Bhandari & Chowdhury, 2016b).

Optimal nutrition all through infancy and early childhood is critical to every child reaching their full developmental capabilities, implying that a child's early years have a substantial influence on their future. Poor nutrition, defined as inadequate quantity and/or quality of diet, likely to result in undernutrition or overnutrition, as well as the absence of learning opportunities earlier in life, contributes to the deprivation of academic and developmental capability, creating long-term economic and health differences in over 200 million 5-year-old children (Hurley et al., 2016).

From conception to age two, within these days are the most rapid days of brain development in a child's life (Schwarzenberg & Georgieff, 2018). During this period, the health, nutrition, and experiences of a child lay the groundwork for future academic achievement and economic productivity. Early adversity, like a lack of responsive caregiving, under-nutrition and poverty are linked to decreased academic achievement and lifetime earnings (Black et al., 2017). Evidence suggests that poverty, under-nutrition, and inadequate care globally put 250 million children at an increased odds of not developing to their highest capacity. (Black et al., 2017).

Children and maternal undernutrition remains a global health concern, with undernutrition among children being a great public health issue that makes children more vulnerable to disease and death. Undernutrition is responsible for approximately 45percent in terms of child deaths (WHO, 2020e), and in 2020 it was estimated that a little less than 150 million children below age five were stunted,

45 million wasted, and about 39 million either obese or overweight. (Bhandari & Chowdhury, 2016b).

Less than half of infants in their initial six months of life are breastfed exclusively, and less than a fourth of young children and infants aged less than 2 years, meet age-appropriate diverse diet and feeding frequency criteria in most countries. (Bhandari & Chowdhury, 2016b). The majority of the estimated 45% of child deaths associated with undernutrition happen in developing countries, within which children are increasingly overweight and obese (Bhandari & Chowdhury, 2016b). Research has shown that Sub-Saharan Africa is home to a good number of all children undernourished worldwide, with 25% underweight, 39% stunted and 10% wasted children 0 to 59 months (Akombi et al., 2017).

Following years of stable decrease in the number of people experiencing hunger, as measured by undernourishment prevalence, the percentage of individuals having hunger started to gradually raise again in 2015. According to the latest projections, close to 9 percent of the global population, are hungry (UN SDG'S, 2015). According to the UN Sustainable Development Goals 2030 "zero hunger" target, a large percentage of undernourished people around the world (381 million) remain in Asia, with above 250 million in Africa, where the proportion of under nourished people is rising more rapidly than in any other continent (UN SDG'S, 2015). Stunting affected a little below 145 million children younger than age five in 2019, with 75% of them living in Sub-Saharan Africa and Southern Asia. Furthermore, 6.9 percent (or 47 million) of children 0-59 months suffered from wasting or acute malnutrition due to infection and a lack of nutrients (UN SSDG 2015).

Malnutrition is among the world's most pressing public health issues, with developing countries bearing the brunt of the burden (Devkota et al., 2015). According to the 2015 MDGs report, despite the global progress that had been achieved, undernutrition remained unacceptably high in Sub Saharan Africa, and far from being solved (United Nations, 2015).

In developing countries like Ghana, the usual form of malnutrition is undernutrition. In Ghana, almost 20 percent of children 0 to 59 months are stunted, with one in every ten children below age five underweight (UNICEF, 2019). Close to 2 in 3 children between 6-24 months are not nourished with food which facilitates their fast-growing bodies and brains (UNICEF, 2019). This makes them susceptible to poor cognitive development, poor learning, low immunity, increased infections and, in several cases, death.

Appropriate nourishment all through early childhood and infancy is important for children's growth, health and development. First 1,000 days of life of a baby are extremely significant, as optimum nutrition for these first 2 years of life reduces morbidity and death rates, lessens the exposure to chronic illness, and promote overall improved development. Poor nutrition, which results in under or overnutrition, in addition to the absence of early learning experiences, results in the loss of developmental capacities as well as long-term economic and health differences among many children aged 0 to 59 months. Single-sector initiatives constituting either nutrition or early child development is associated with better child nutritional status and/or development, and current ideas actively support the implementation and testing of combined interventions (Hurley et al., 2016).

Responsive caregiving refers to the caregiver's power to understand, observe and react to the child's cues promptly and properly. Caregiving that is responsive is crucial for safeguarding children's nutrition, health, security and safety. Also it promotes early learning, which happens when a young

child or an infant interacts with an object, place or a person in their surrounding (Gladstone et al., 2018). On the other hand, a mutual connection between an infant or child and his or her caregiver is defined as responsive feeding when the child communicates desires for food and safety through verbal and nonverbal signals accompanied by an immediate response from the caregiver.

Early breastfeeding initiation in the first hour after birth, exclusively breastfeeding in the initial 6 months of a child's life, the initiation of safe and nutritionally sufficient family foods in the sixth months, and carrying on with breastfeeding until the child is 24 months or older are all aspects of optimal infant and young child feeding. For optimal infant and young child feeding, World Health Organization (WHO) and United Nations Children's Fund (UNICEF) recommend that one needs to consider all these aspects of optimal feeding especially for the first 1000 days of life. However, many children between 0 to 59 months do not receive optimal feeding. During the period of 2015-2020, it was estimated that, only about 44% of infants' 0-6months were exclusively breastfed worldwide (Bhandari & Chowdhury, 2016b).

1.2 Problem statement

Health entails more than just the absence of disease. As a result, nutrition must be accepted as a critical component of well-being and health, as well as a factor in human capital development. Young children who receive appropriate nutrition, nurturing caregiving, and early learning opportunities have the greatest chance of thriving. The connection of infants or young children with an object, place or a person in the surrounding creates opportunities for early learning while also certifying children's nutrition, health, safety, and security. Appropriate cognitive development and physical growth are dependent on child and maternal nutrition during the first 1000 days, which has lifelong economic and health consequences for individuals and nations. The start of

adult well-being and health are established from conceiving stage to 2 years, that is, the first 1000days and in early childhood, according to advances in brain science (Black et al., 2015). Nutrition interventions do not appear to have an influence on early childhood development when applied alone, but they are linked with improved childhood development when combined with support for responsive caregiving and learning opportunities.

Children's future is compromised and young lives are jeopardized as a result of malnutrition, whereas good nutrition aid them to develop, grow, survive, play, participate, contribute and learn. Malnutrition is a major public health concern that impacts nations' overall potential by lowering individuals' economic productivity and earning capacity, as well as nations' human capital, thereby obstructing development and economic growth. According to studies, children who are stunted earn between 20 to 65 percent less in adulthood compared to those who receive proper nourishment. The cost of undernutrition and deficiency in micronutrients at the population level is approximated to be less than 4 percent of worldwide GDP, or about USD 2 trillion annually (WFP, 2018). At least one out of every three children younger than the age of five is not growing well due to either stunting, wasting, or overweight in the world. While at least half of children below age five experience hidden hunger because of vitamin and other essential nutrient deficiencies (Keeley et al., 2019).

Breastfeeding can spare about 820,000 children's lives in the world each year when all children aged 0 to 23 months are breastfed optimally (Bhandari & Chowdhury, 2016b). However, only two in five infants 0 -5 months are breastfed exclusively, as recommended (Keeley et al., 2019). The main cause of childhood malnutrition is poor diet. Globally, a 44 percent of children between 6 to 23 months are not given fruits or vegetables, while less than 60% do not receive eggs, dairy, fish, or meat. Only one out of every five children below 24 months from low-income families and

rural areas receives the required dietary diversity for positive growth and cognitive function (Keeley et al., 2019). Globally, only 64.5% of infants aged 6-8 months are fed solid, semisolid, or soft foods, with low rates of Minimum Meal Frequency and Minimum Dietary Diversity of 52.2% and 29.4% respectively (White et al., 2017). In addition, Minimum Meal Frequency is less than 50% and Minimum Dietary Diversity is less than 25% in Africa and South Asia. Minimum Acceptable Diet rates were low across all regions, with West and Central Africa having the lowest rates at 8.6% (White et al., 2017). In Africa and South Asia, rates for all complementary feeding indicators are the lowest, whilst rates of continued breastfeeding at 12 and 24 months are however high (White et al., 2017).

Globally, one out of three children below age five is not growing well due to stunting, wasting or overweight, however, in West and Central Africa, the figure rises to one in every five children under 5 years (UNICEF, 2019). In 2018, 149 million children below age five were stunted, with nearly 50 million being wasted globally, whereas in West and Central Africa, about 29 million children below age five were stunted, with 7.9 million wasted (UNICEF, 2019). In many countries, the majority of the decline in length- for-age during the first two years of life occurs between 6 and 23 months of age (White et al., 2017). Inadequate quantities and quality of complementary foods, as well as poor feeding practices and increased infection rates within this period, are immediate possible causes for stunting (White et al., 2017).

Children need safe and nutritious diets with a variety of nutrients when they begin to eat soft, semi-solid, or solid foods at sixth months. Children's bodies and brains can be harmed if their diets are not diverse enough. It is recommended by WHO and UNICEF that, children of this age consume at least 5 out of the 8 food groups. About, 53% of children in West and Central Africa are not getting enough nutrients from animal sources and 40% of the children these regions are not given

any fruits or vegetables. Thus, In West and Central Africa, three in every four children do not consume a diverse diet (UNICEF, 2019).

Africa and Asia have the highest rates of malnutrition in all of its forms. In 2019, Asia represented above 50% of all stunted children 0 to 59 months, while Africa recorded two-fifths (Asia= 54%, Africa= 40%), also Asia rated more than half of all wasted children 0 to 59 months while greater than one quarter were in Africa (Asia= 69%, Africa= 27%). From 2000 to 2020, the only continent with increased number of stunted children, that is from 54.4 million to 61.4 million was Africa (UNICEF/WHO/WORLD BANK, 2021).

According to WHO, 250 million children (45%) below five years are at an increased odds of not attaining their developmental capacity because of extreme poverty and stunting in developing countries (World Health Organization (WHO), 2019). According to an Indian study, the main determinants of stunting are birth weight, child feeding, women's nutrition, and household sanitation. And among children aged 6-23 months, a child with low birth weight has a 2.5 higher risk of being stunted than a child with normal birth weight (DHS, 2018). Also, stunting was found to be significantly associated with low birth weight and poor complementary feeding practices in a study conducted in Sri Lanka (DHS, 2018). Evidence suggest that, under nutrition in Africa is growing faster than any other place in the world (UN SDG'S, 2015). Sub Saharan Africa is responsible for about 33.3% of all undernourished children worldwide, with approximately 39% stunted, 25% underweight and 10% wasted children between 0 to 59 months (United Nations, 2015).

Ghana ranks among the 36 countries with higher stunting burden. A study revealed that, 45 percent of Ghanaian children are exposed to not reaching their full developmental capability as a consequence of stunting or extreme poverty (Lu et al., 2016). Children in Ghana suffer from serious nutritional deficiencies with almost 20% of children 0 to 59 months are stunted, 11% underweight and 5% are wasted, further impeding brain development (USAID, 2019). Also, another study by Boah et al, showed that, about 18.4% of Ghanaian children less than five years are stunted, 10.4% are underweight and 5.3% are wasted (Boah et al., 2019). Initially, early childhood development services and materials in Ghana seemed to focus more on children 48 to 60 months and emphasized the importance of preparing children for primary school. However, stakeholders have expressed a keen interest in developing policy guidelines and initiatives for children aged 0 to 3 years recently.

In 2018, Northern region had the highest rate of stunting at 29 percent among children below five years in Ghana. Furthermore, in contrast to the national average of 68 percent, the Northern (54%) and Upper East (51%) Regions have few children between the ages of three to five who are developmentally on track. Support for learning is very poor across the country at only 33%, with Northern region having the lowest rate at 22% (USAID, 2022).

In 2017, the prevalence of stunting, wasting and underweight were 28.2, 9.9 and 19.3% respectively in Northern region (Ali et al., 2017). Taking population size and stunting rates into account, stunting rates vary by region, ranging from 10.4 percent in Greater Accra to 33.1 percent in the northern part. Underweight rates are similar, with 8.7 percent of children between 0 to 59 months being overweight in Greater Accra compared to 20 percent in the Northern part (Government of Ghana, 2016). The Northern region had the highest rates of stunting and underweight, according to the Ghana Demographic and Health Survey, with 33.1 percent stunting

and 20 percent wasting (GDHS, 2014). This demonstrated how inadequate young child feeding and other forms of care are in the region. Also, only 21.3% of children under five received Minimum Acceptable Diet in the Northern Region, while 33.3 and 48.4% received Minimum Meal Frequency and Minimum Dietary Diversity respectively (GDHS, 2014).

In 2017, Sagnarigu municipal had the highest percentage of all stunted children in the Northern Region, at 47.6%, as well as the highest percentage of underweight children, at 31%. Meanwhile, with 2.9%, the district has the lowest rate of underweight women in the Northern Region (FeedtheFuture, 2017). Nurturing care includes an environment and behaviors that assure a child's proper nutrition, overall well-being, responsive caregiving, early opportunities to learn, and security and safety. Several interventions and programs have been launched in Ghana, particularly in the North where malnutrition is very high, to address early childhood development and nutrition challenges but prevalence of malnutrition is still higher than accepted. Most of these projects seek to empower women/caregivers to adopt good feeding and care practices to improve the nutrition and overall health of children. Therefore it is in the light of this that, this study is designed to investigate responsive care and feeding practices of mothers or caregivers, and how this affects children's nutritional status in Sagnarigu Municipal.

1.3 Significance of the Study

The health, nutrition, and experiences of a child during the first 1000 days of life set the stage for future economic productivity and educational attainment. Early adversities, such as a poverty, absence of responsive caregiving, and malnutrition, are linked to lower academic achievement and

lifetime income (Black et al., 2017). The health status of women and children is one of the substitutes used in measuring a country's level of development. The nutritional status and health of children aged 0 to 59 months should not be taken for granted if the Sustainable Development Goals 2 and 3 are to be met by 2030.

As a result, the findings of this study will help determine whether children between 6-24 months are surviving and thriving in the municipality, as well as whether the municipality is on track to meet SDGs 2 and 3. Findings from this study will also aid in measuring progress toward the World Health Organization's recommendation 3 for improving Early Child Development, which is to integrate caregiving and nutrition interventions for optimum infants and young child nutrition.

Several programs and interventions exist in the Sagnarigu municipal, some of which have come to an end. The expected impact of these programs is to improve early childhood development, children's nutritional status and reduce the prevalence of under nutrition. As a result, this study will determine whether or not this is the case.

1.4 Conceptual Framework

The UNICEF conceptual framework has been updated to mirror knowledge advances and plans in child nutrition and health over the last 25-30 years. The framework developed in 1990 acted as a catalyst for research, programs and policies that have advanced nutritional practices and health around the world, contributing to successful child survival and significantly lowering the rate of undernutrition (Black et al., 2020). The application of the Sustainable Development Goals (SDGs) demonstrated international recognition that, future prosperity, peace, freedom and health are dependent not only on child survival, but also on child thriving (Black et al., 2020).

Thriving includes children's ability to learn, form relationships, and take on responsibilities, eventually establishing a family, providing economic stability, and contributing to society. Children require responsive relationships as well as opportunities to learn and explore in safe and secure environments. Combining nutrition interventions that improve children's nutritional status and growth with interventions that promote children's neurodevelopment through responsive caregiving and learning (Prado et al., 2019). Nutrition interventions do not appear to have an influence on early childhood development when incorporated alone, but they are linked to enhanced childhood development when blended with support for responsive caregiving and learning opportunities (WHO, 2020d).

To be able to thrive and realize the Sustainable Development Goals (SDGs), children must prioritize responsive caregiving , nutrition, health, learning, , safety, and security (Black et al., 2020). The children thriving and surviving conceptual framework demonstrates the additional strength required for thriving while trying to retain the basic structure of the previous conceptual framework, with a focus on the distal and proximal environment.

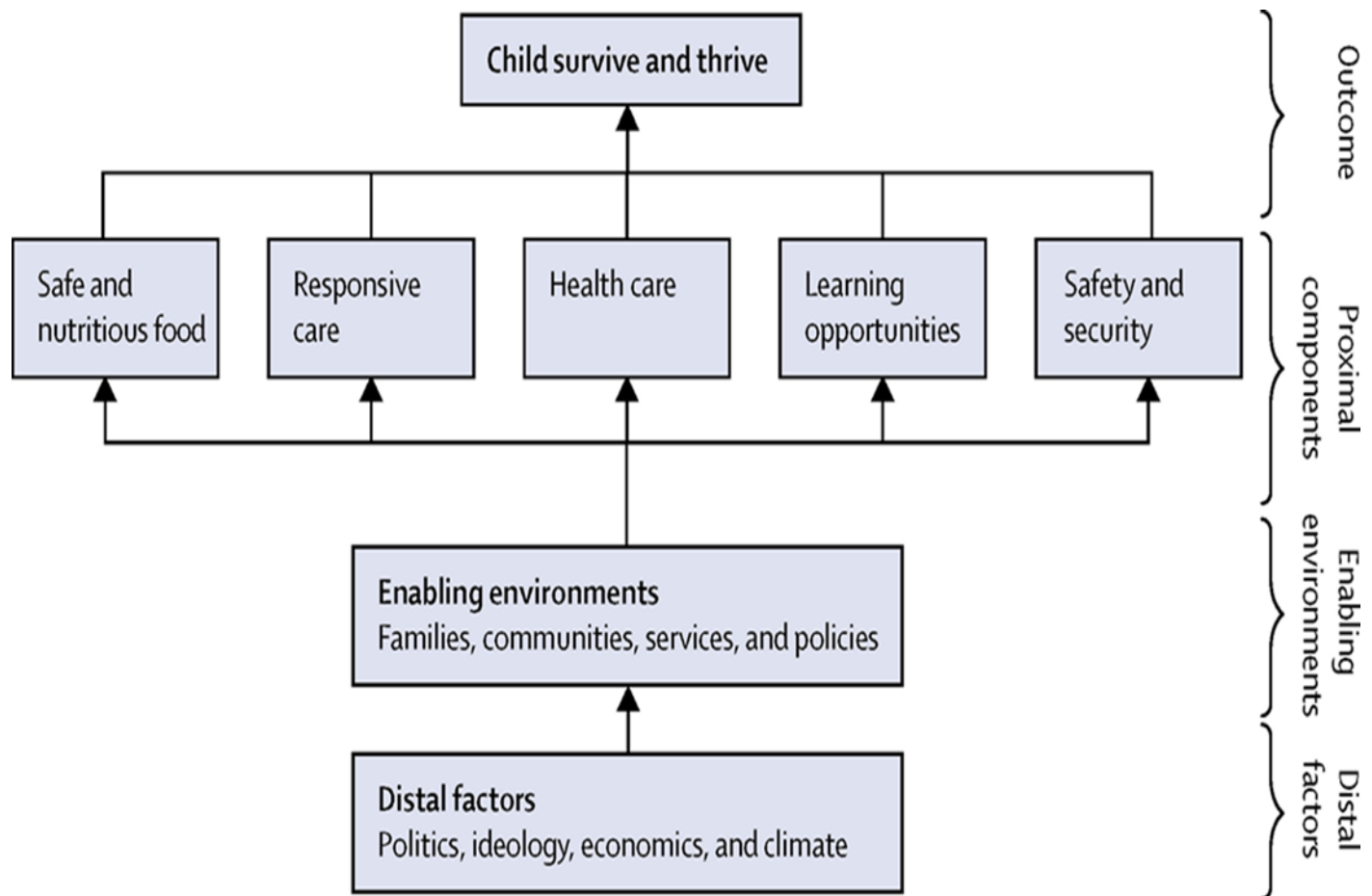


Figure 1: CONCEPTUAL FRAMEWORK OF CHILD SURVIVING AND THRIVING

Adopted from : (Black et al., 2020).

1.5 Research questions

- i. Were mothers/caregivers in Sagnarigu Municipal practicing responsive care?
- ii. Were mothers/caregivers in Sagnarigu Municipal involved in good feeding practices?
- iii. What was the nutritional status of children between 6-24 months in Sagnarigu Municipal?
- iv. What was the association between nutritional status and responsive care and feeding practices?

1.6 General objective

To assess responsive care and feeding practices of mothers/caregivers and nutritional status of children between 6-24 months old.

1.6.1 Specific objectives

- i. To assess responsive care practice among mothers/caregivers with children 6-24months.
- ii. To assess feeding practices among mothers/caregivers with children 6-24months.
- iii. To assess the nutritional status of children aged 6-24months in Sagnarigu Municipal.
- iv. To determine the association between nutritional status of children 6-24months old and responsive care and feeding practices of mothers/caregivers.

CHAPTER TWO

LITERATURE REVIEW

2.1 Early Childhood Development

ECD, as defined by WHO, is the process of cognitive, motor development, physical, temperament, socio-emotional, and language of children from conception to the age of eight years (WHO, 2020a). Investing in early childhood development is among the most effective method for a country to increase general welfare, enhance inclusive economic growth, expand equitable opportunity, and eliminate severe poverty (UNICEF, WHO, 2018).

As 2015 came to an end, the world saw a nearly lessening of child and maternal deaths due to the Millennium Development Goals (MDGs), particularly MDGs 4 and 5, which propelled in unexpected global consciousness to maternal and child health. This reaffirmed the commitment to accelerating the progression through the Sustainable Development Goals (Sharma et al., 2017). Many consider the period of early life, from birth to eight years, to be crucial for the growth of fundamental sensory-motor, cognitive, socio-emotional and language skills (Sharma et al., 2017).

Between a mother's pregnancy and her child's second year of life, there is a 1,000-day window of opportunity to influence a child's development. It is a time of enormous potential as well as tremendous vulnerability. The first 1,000 days of a child's life can determine the distinction between a thriving future and one marked by a challenge. Recent neuroscience and early childhood development study is putting a spotlight on how our brains develop and how our abilities are nurtured or impeded (Thinkbabies, 2017). Nutrition throughout children's first 1,000 days, along with firm, responsive caregiver relationships and safe, nurturing environments, lays the groundwork for the child's development (Thinkbabies, 2017). If one or more of these supports

is missing, a child's emotional, physical, social and cognitive development could struggle, causing the loss of opportunities that each and every child is guaranteed at birth.

Nutrition, in a way, is the fuel that propels early development of a child. Good nutrition during pregnancy and early childhood is critical to a child's ability to grow, learn, and thrive. In the first thousand days of life, the brain grows faster than at any other time in a human's life, and a child requires the right nutrients at the appropriate time to feed his or her brain's rapid development.

Early Childhood Development (ECD) is a time of rapid and crucial development that lasts from conception to the age of eight years. Proper nutrition, adequate health care, play, protection and early education are critical for children's physical, cognitive, linguistic, and social-emotional development during this period (INEE, 2018). Allowing children to reach their full potential is both a human right and a prerequisite for long-term development.

WHO recommends the following measures to improve early childhood development: first and foremost, in the first three years of life, all infants and children must receive responsive care, parents and other caregivers should be assisted to provide responsive care. Secondly, in the first three years of life, all children and infants should participate in early learning activities with their parents and other caregivers; parents and other caregivers must be encouraged to take part in early learning with their children and infants. Thirdly, interventions for optimal infant and young child nutrition should include responsive care and early learning support. And lastly, early childhood development and health services should include psychosocial interventions to promote maternal mental health (WHO, 2020a).

The goals of the UN Secretary-General's Strategy for Women's, Children's, and Adolescents' Health are to thrive, survive, and transform (2016-2030). While significant advances

have been made in reducing under-five mortality, with the number of childhood deaths falling from about 12 million in 1990 to 5 million in 2019, many children who survive do not thrive (Health et al., 2021). Not less than 250 million children below age five are at an increased odds of not attaining their developmental potential globally, which could have serious consequences for their health, education, productivity, and well-being throughout their lives (Health et al., 2021). Unfortunately, far too few children get even the most basic developmental interventions. Globally, the rate of exclusive breastfeeding is less than 50%, and nearly 22% of children under age five are stunted (UNICEF/WHO/WORLD BANK, 2021).

Millions of children around the world are lacking in the benefits that quality ECD can provide, at least one out of every six children worldwide has a developmental problem (WHO, 2020c). Due to extreme poverty and stunting, an estimated 250 million children (43%) below age five in developing countries are at an increased odds of not reaching their developmental potential (Tamburlini, 2018). Less than half of preschool-aged children in Low –and –Middle –Income –Countries (LMICs) do not meet basic developmental milestones either in cognitive or socio-emotional development (Sharma et al., 2017). Developmental deficiencies are most likely to have a negative impact on academic performance and reduce adult opportunities, compounding a poverty cycle across generations. Poverty and stunting pose developmental risks that are assumed to result in a 25% yearly decrease in adult income-earning ability (Sharma et al., 2017).

Maternal depression is an additional risk factor affecting one in every six women during the perinatal period and can be resolved with interventions that can be implemented in primary care. Ghana has taken significant political obligations to improve children's development, as well as the adoption in 2004 of a multi-sectorial Early Childhood Care and Development (ECCD) Policy. Despite this, 45 percent of Ghanaian children seem to be at a high odds of not developing to their

full potential due to extreme poverty or stunting (Lu et al., 2016). About 33.3% of Ghanaian children aged 36 - 59 months fail to meet expected milestones in cognitive, physical, social-emotional, and communication skills. Furthermore, 73 percent of children in Ghana is classified as multidimensionally poor, which means they are deficient in three or more main areas of well-being, such as nutrition, health , learning and development, child protection, information, water, sanitation and hygiene (USAID, 2022).

In 2018, the Northern region of Ghana had the highest rate of stunting in children between 0 to 59 months, at 29 percent. Furthermore, Northern (54%) and Upper East (51%) Regions have few children aged between three to five who are developmentally on track than the national average of 68 percent (USAID, 2022).

Decision to invest in Early Childhood Development is crucial in reaching some SDGs, such as, SDG 2 on ending all aspects of malnutrition, SDG 3 on ensuring well-being and health for all, and SDG 4 on securing equitable and inclusive quality education and promoting long term learning opportunities for all (Sharma et al., 2017).

2.2 Responsive Care and Feeding

The ability of a caregiver to understand, observe and react to a child's signs promptly and appropriately is known as responsive caregiving. Caregiving that is responsive is necessary for safeguarding children's nutrition, health, security and safety. It also allows for early learning, which happens when a young child or infant interacts with an object, person or place in their surroundings. WHO recommends that all children and infants receive responsive care in the first three years of life in order to improve early childhood development whilst supporting parents and

other caregivers to provide responsive care (WHO, 2020a). Responsive feeding is a process of nourishing young children that involves looking out for hunger cues and reacting to them by giving food. It also considers satiation cues, stopping the meal when a young child indicates he's full. Responsive feeding is a two-way connection between caregiver and child. Providing optimal feeding to infants from birth aids in the improvement of ECD (WHO, 2020a).

2.3 Infant and Young Child Feeding (IYCF)

The body requires the proper amount and quality of food, as well as its nutrients, to grow, build tissue, reproduce and carry out bodily functions. Under nutrition raises the risk of death and prevents children from reaching their full potential. Children who do not obtain healthy nutrition within their first thousand days of life have compromised immunity, cognitive development being impaired, have a lower learning capacity, and have a high odds of developing non-communicable diseases later in life. Nutrition is an important growth and development driver throughout the life cycle. Fetal life and early childhood years are periods of maximum development and growth, clashing with a period of great susceptibility to a sub-optimal environment, with both immediate and lifelong effects. It is in this perspective that optimum infant and young child feeding is critical.

Optimal Infant and Young Child Feeding (IYCF) practices include starting breastfeeding not more than an hour after birth, breastfeeding exclusively for the initial 250 days of life, and continuing breastfeeding up to 24 months and beyond, as well as, age-appropriate solid, safe, semi-solid, and soft food feeding beginning at the sixth month. Infant and young child feeding play a significant part in assessing nutritional status of children, improving children's growth rate in the early days of life, and having the power to reduce malnutrition in children under-five and thus affect the mortality rate of children.

Previous research has found that feeding practice is the most significant element influencing children in the ages of 0 to 59 months nutritional status (Palupi et al., 2019). Suboptimal infant and young child feeding practices can result in under nutrition in children, however, good feeding practices increases intake of diets and, as a result, improves nutritional status of children. Evidence suggest, majority of children are initiated to the wrong kind of diet around the age of six months when they begin transitioning to soft or solid foods. About 45 percent of the children aged six months to two years do not receive any fruits or vegetables. Almost 60% of the population does not consume eggs, dairy, fish, or meat (UNICEF, 2019).

2.3.1 Early Initiation of Breastfeeding

To protect the newborn from infection and decrease newborn mortality, breastfeeding must start within the first hour after birth. This encourages emotional bonding between baby and mother and lengthens the period of exclusive breastfeeding. Breast milk production and flow is stimulated when a mother begins breastfeeding not more than an hour after birth. Colostrum, the initial yellowish and golden milk produced in the newborn's early days of life, is thus a significant start point for immune protection and nutrition. Marriotte et al. discovered a positive relationship between early breastfeeding initiation and lowering the prevalence of underweight in less developed countries (Marriott et al., 2012). According to a study conducted in Malawi, 78% of children were breastfed in the first hour after birth (Walters et al., 2019). In contrast, UNICEF reported that, only 34% of newborns in South Asia are put to breast within the first hour of life for deliveries by skilled birth attendants (Keeley et al., 2019). Mothers who go through caesarean section mode of delivery are less likely to start breastfeeding within the first hour of life.

In Ghana, early initiation of breastfeeding is 52% with 57.8% of babies in the Northern region being put to breast in the first one hour of their life (GSS, 2019).

2.3.2 Exclusive Breastfeeding

Breastfeeding is among the most effective methods of ensuring a child's health and survival. However, for the preferred 6 months of exclusive breastfeeding, almost two-thirds of all infants are not exclusively breastfed, a situation that has not improved in two decades (WHO, 2021b)

Breast milk is a perfect source of nutrition for infants. It is natural, free, safe, and clean, and it contains antibodies that help strengthen the immune system and protect the baby from a variety of childhood illnesses such as respiratory and gastrointestinal (vomiting and diarrhea) infections, sudden infant death syndrome, asthma, type 2 diabetes, and others. Breast milk offers all the nutrients and energy that an infant needs within the initial months of life, and it goes on to offer up to 50 percent or higher of a child's nutrition during the second half of the first year, and up to about 33% of children's nutritional requirements through to the second year of life (WHO, 2021b).

Breast feeding benefits both mothers' and children's health, nutrition, and emotional well-being. Breastfeeding for a longer period benefits mothers' health and well-being. Breastfeeding mothers are at a decreased risk of developing ovarian cancer, breast cancer, type 2 diabetes, or high blood pressure. Exclusive breastfeeding helps to space pregnancies, that is, exclusive breastfeeding of babies under 6 months has hormonal effects, including a lack of menstruation. Although not foolproof, this is a natural method of birth control known as the Lactation Amenorrhea method. When a mother exclusively breastfeeds her child, she provides significant protection against gastrointestinal infections. To safeguard the newborn from infections and reduce newborn

mortality, breastfeeding should start within one hour after birth. Infants who are only partially breastfed or are not breastfed at all can develop diarrhea and other infections, increasing the risk of infant mortality. Breast milk is also a good source of energy and nutrients for children, especially those between the ages of 6 and 23 months.

Even though breastfeeding could save lives, only a little above 40% of infants 0 to 6 months are exclusively breastfed around the world, and an increasing number of infants are fed infant formula (WHO, 2021b). According to the Global Nutrition Target 2025 policy brief series, below 40% of infants worldwide are exclusively breastfed during the first 6 months of life (WHO, 2018). This implies no remarkable progress in the number of infants 0 to 6 months exclusively breastfed when these percentages are compared. Also in developing countries, only 37% of infants aged six months and under are exclusively breastfed (WHO, 2018). According to the findings of an observational study in Sub-Saharan Africa, infants in less developed countries who were fed mixed feeding before the age of 6 months died nearly three times more often compared to those who were breastfed exclusively (Remans et al., 2011). According to the most recent Ghana Multiple Indicator Cluster Survey (MICS) results, the percentage of Ghanaian children who are exclusively breastfed has decreased from 52% to 43% (GSS, 2019).

2.3.3 Complementary Feeding

Complementary feeding is the introduction of other foods and liquids when an infant's nutritional needs cannot be met solely by breast milk. WHO and UNICEF suggest nutritionally adequate and safe complementary feeding beginning at 6 months, with continued breastfeeding until the child is 24 months old or beyond (Bhandari & Chowdhury, 2016a).

Nearly 67% of children aged six to twenty four months do not receive the nutrition that supports their fast-growing bodies and brains (UNICEF, 2019). Hence, they are more likely to have poor brain development, learning difficulties, low immunity, increased infections, and, in some cases, death. Complementary feeding is initiated in infants following the first six months of life, with continued breastfeeding frequently and on-demand to 24 months or more, when their nutritional needs surpass what breast milk alone can give, they are exposed to malnutrition if solid foods are not introduced. Infants are developmentally ready for other foods after the first six months, however, the untimely introduction of complementary foods can result in growth faltering in the infant. Whereas sick children frequently have small appetite for solid food, sustained breastfeeding could protect them from dehydration while offering the nutrients needed to recover. Breastfeeding can avert 50% of all infectious disease deaths in children aged six to 23 months (Remans et al., 2011).

Breastfeeding is constantly linked to higher intelligence test performance in children and adolescents, with children who have been breastfed for more than a year benefiting the most. Breastfeeding for a long period of time could decrease children's odds of being overweight or obese. A 14-country study discovered that children between the ages 6 to 8 months who took solid or semi-solid foods were less likely to be stunted or underweight (Remans et al., 2011).

2.3.4 Minimum Dietary Diversity (MDD)

Children between the ages 6 to 23 months should be given diverse diets to ensure that nutrient needs are met, according to WHO guiding principles for feeding the breastfed child and the non-breastfed child (UNICEF, 2013). To improve linear growth in young children, they must be fed a diverse diet that includes at least four or more of the seven food groups. A diet deficient in diversity could increase the likelihood of deficiency in micronutrients, which can harm children's physical and cognitive development (UNICEF, 2010). Evidence suggests that stunting is associated with a lack of nutrient-dense foods like dairy products, eggs, fruits, and vegetables between children 6 and 23 months (Britto et al., 2017). In Ghana, only 24% of children between 6 to 24 months eat a diversity of foods; undoubtedly, for the group most susceptible to malnutrition, the number of children introduced to diverse foods is very low (UNICEF, 2019).

2.3.5 Minimum Meal Frequency

Breastfed infants aged 6 to 8 months should be given complementary foods two to three times a day. Breastfed children between the ages of 9 and 23 months should be given complementary foods 3 to 4 times each day and an extra nutritious snacks available 1-2 times a day (UNICEF, 2013). Giving meals/snacks less frequently as suggested can reduce total energy and micronutrient intake, leading to growth stalling, stunting, and micronutrient deficiency.

2.3.6 Minimum Acceptable Diet

The minimum acceptable diet is defined as breastfed children receiving at least the minimum dietary diversity and meal frequency appropriate for their age the previous day. Children between 6-23 months should be given meals at a reasonable frequency and variety to make sure their energy and nutrient requirements are met.

2.4 The Concept of Malnutrition

Malnutrition is a broad term that refers to "poor" nutrition and can be caused by deficiencies, excesses, or imbalances in a person's nutrient and/or energy intake. Malnutrition is defined as nutrient deficiencies or excesses, a nutrient imbalance, or impaired nutrient utilization (WHO, 2021a) . According to World Food Program (WFP), malnutrition occurs when an individual's nutrient and energy intake falls short of, or exceeds, the requirements for growth, immunity, and organ function (WFP, 2018). That is, nutrients in a person's diet are either less than required or more than required, resulting in a health problem. Malnutrition in all of its aspects includes under nutrition, lack of vitamins and minerals, being overweight or obese, and developing diet-related non communicable diseases. Under nutrition accounts for approximately 45 percent of child deaths among children under age five, with the many deaths occurring in less developed countries (LMICs), while childhood overweight and obesity rates are rising in these same countries (WFP, 2018).

2.4.1 Prevalence of Malnutrition

Malnutrition rates continue to be alarming. Stunting is decreasing too slowly, while wasting continues to have a negative impact on the lives of a significant number of young children. Malnutrition is a major public health problem that impacts nations' overall potential by lowering individuals' earning capacity and economic productivity, as well as nations' human capital, thereby impeding economic growth and development. According to studies, children who are stunted earn between 20 to 65 percent less as adults compared to those who receive proper nutrition. (WFP, 2018). The cost of under nutrition and micronutrient deficiencies at the population level is approximated to be less than 4 percent of global GDP, or about USD 2 trillion per year (WFP, 2018).

Malnutrition and under nutrition are frequently used interchangeably. In reality, both under nutrition and over-nutrition are forms of malnutrition, that is, under nutrition occurs when the body receives fewer nutrients than it requires. Under nutrition is caused by a lack of energy, protein, and/or micronutrients, as well as poor absorption or rapid loss of nutrients due to illness or increased energy expenditure. Over nutrition occurs when one or more nutrients and/or energy intake exceeds requirements to the point where health suffers. If under nutrition occurs during pregnancy or before the age of two, it can lead to permanent problems or chronic conditions with physical and mental retardation. Undernutrition is classified into four types: wasting, stunting, underweight, and vitamin and mineral deficiencies. Children are especially vulnerable to disease and death as a consequence of undernutrition.

In 2020, it was estimated that nearly 150 million children 0 to 59 months were stunted, 45 million were wasted, and almost 39 million were overweight or obese (Bhandari & Chowdhury, 2016b). In Ghana, one in every five children below age five is stunted, and one in every ten children under

age five is underweight (UNICEF, 2019). Almost 67% of children aged between six to twenty four months do not receive nutrition to support their rapidly growing brains and bodies (UNICEF, 2019). As a result, they are more likely to experience learning difficulties, poor brain development, low immunity, increased infections, and, in some cases, death.

2.4.2 Stunting

Stunting also known as low height- for- age, is a detrimental result of inadequate nutrition during pregnancy and early childhood. Children who are stunted may never reach their full height potential, and their brains may never develop to their full cognitive potential. Children who are stunted start their lives at a significant disadvantage; they struggle in school, earn less as adults, and face difficulties in participating in their communities (WHO, 2020b). In 2020 and 2019, Asia represented more than 50 percent of all children below age five who are stunted, with Africa recording for two out of every five (UNICEF/WHO/WORLD BANK, 2021). The prevalence of stunting among children is decreasing in all regions excluding Africa, where the number of stunted children is increasing. In Africa, it increased from 49.7 million to 57.5 million between 2000 and 2019 (UNICEF / WHO / World Bank Group, 2020). This rate further increased in 2020 to 61.4 million in Africa alone (UNICEF/WHO/WORLD BANK, 2021). Seven percent of children under age five are wasted and 18% are stunted in Ghana (USAID, 2021). In Ghana, one out of every five children experiences stunted growth in their initial thousand days after birth due to inadequate nutrition, frequent illness, and an unsafe environment (GDHS, 2014).

2.4.3 Wasting

A wasted child is one who is too thin for his or her height. Wasting occurs as a result of rapid weight loss or an inability to gain weight. A child who has been moderately or severely wasted seems to be more likely to die, but there is treatment. Children with wasting have weakened immunity, are more likely to experience long-term developmental delays, and are at a high risk of dying, especially if the wasting is severe however, treatment is possible (WHO, 2020b). Millions of young people's lives are compromised around the world as a result of wasting. In 2020, wasting continued to endanger the lives of about 45.4 million (6.7%) children under age five around the world, with the prevalence remaining unchanged from 2018 to 2019, with 49 million (7.3%) and 47 million (6.9%) children under age five respectively (UNICEF/WHO/WORLD BANK, 2021). Severe wasting among children below age five was approximated to be 13.6 million in 2020, out of a total population of 45.4 million wasted children, with Asia and Africa having the highest rates of severe wasting at 8.9 percent and 6.0 percent, respectively (UNICEF/WHO/WORLD BANK, 2021). In Africa, the prevalence of wasting decreased from close to 12.8 million in 2019, with 3.5 million severely wasted (UNICEF / WHO / World Bank Group, 2020) to 12.1 million in 2019, with 3.0 million severely wasted (UNICEF/WHO/WORLD BANK, 2021).

CHAPTER THREE

METHODOLOGY

3.1 Study Area

The study was carried out at Sagnarigu Municipal in the Northern region of Ghana. The Sagnarigu Municipal is among the 16 districts in Northern region of Ghana in the northwest corner of the Northern region, with Sagnarigu as the district capital. Savelugu municipality borders the district to the north, Tamale metropolis to the south and east, Tolon district to the west, and Kumbungu district to the north-west. The population of the municipality is 341,711, with a population density of 753.4 people per square kilometer (Ghana Statistical Service, 2021).

3.2 Climate and Vegetation

The Municipal is located on the western margin of the Tropical Continental belt, experiencing a single maximum rainfall regime brought in by the rain-bearing Tropical Maritime air mass (MT) once a year from approximately April to October, after which it is influenced by the Tropical Continental air masses (Ghana Statistical Service, 2014).

The average annual rainfall ranges from 100cm to 115cm. The annual temperature range is high, around 11oC, compared to 7degree Celsius in the middle belt and 6degree Celsius along the coast (Ghana Statistical Service, 2014). The Municipal's annual average temperature is 27.4 degrees Celsius. This ranges from about 35 degrees Celsius in March to about 27 degrees Celsius in August (Ghana Statistical Service, 2014). The high temperature is suitable for drying and preserving the large quantities of groundnuts and other cereals produced in the Municipal.

3.3 Study Design

A quantitative study approach was used with a facility-based cross-sectional study design. Data was collected from participants through a structured questionnaire.

3.4 Study Population

The target population included mothers or caregivers with children 6-24 months living in Sagnarigu Municipal and willing to participate in the study.

3.5 Sample Size Determination

Cochran's formula for estimating sample size was used to decide the sample size for the study.

$$\text{Size; } n = z^2pq / e^2$$

Where:

- e is the desired level of precision that is, the margin of error of 5%
- p is the prevalence of underweight of children < 5 years in Ghana = 20.0% (Amoafu, 2016).
- q = (1 - p).
- z is the confidence interval at 1.96
- n = calculated sample size using a prevalence of underweight (20.0%)

$$\text{This implies } n = (1.96)^2 (0.20) (0.80) / (0.05)^2 = 245.9$$

A sample size of 270 was obtained after adjusting for 10% non-responses and recording errors.

3.6 Sampling Technique

Multistage sampling technique was used. The Sagnarigu municipal has six sub-districts of which three sub-districts were selected randomly using simple random sampling through the lottery method. A systematic sampling technique was then used to select health facilities for data collection using a sampling frame of one to eighteen facilities to stand for the eighteen health facilities in the three sub-districts selected. With a sampling interval of three starting from one, six health facilities were selected for data collection. Four percent of children under 2 years in the municipal (SMHD, 2021) was used to calculate the population of children under 2 years for each health facilities selected. Population of children less than two years for each facilities was then divided by the total population of children less than two years for all six health facilities and multiplied by the sample size of 270 to arrive at the proportion to be interviewed in each facility.

Table 1: **Proportion of mothers/caregivers interviewed at each facility**

Name of Facility	Population of Children under 24 months	Proportion of mothers interviewed
Choggu Health Centre	838	80
Bagabaga Health Centre	477	46
Kanvili Health Centre	286	27
Malshegu CHPS	523	50
Sagnarigu Health Centre	469	44
Garizegu CHPS	236	22
Total	2,829	270

3.7 Inclusion Criteria

All mothers or caregivers who had children 6 to 24 months in the Sagnarigu municipal willing to participate were eligible for study. Except mothers with special conditions like mental disorders, death and dump etc.

3.8 Exclusion Criteria

Children in the municipality aged 6 to 24 months who were sick at the time of the research were excluded. Children that were not permanent residents of the municipality but were residing there during the time of the study were also barred from participation.

3.9 Dependent Variable

Nutritional status of child (stunting, wasting and underweight).

3.10 Independent Variable

Responsive care: the care practices a child was engaged in, in the past 3 days (Read books or look at a picture book, told stories, sang songs to/with, taken outside home, played with, named, counted or drew things with/for), exclusive breastfeeding, breastfeeding frequently and based on demand, time of weaning, early introduction of complementary feeds, minimum dietary diversity, minimum meal frequency, minimum acceptable diet, educational level of mother/ caregiver, marital status of mother/ caregiver, occupation and religion of caregiver/ mother.

3.11 Data Collection

Data was collected using kobo collect software. The questionnaire was grouped into sections such as socio-demographic characteristics of mother/caregiver-child pair, feeding practices of mothers/caregivers, responsive care practices and nutritional status of children 6-24 months.

Responsive care practice was assessed using a structured questionnaire by asking mothers/caregivers whether in the past 3 days, the child was engaged in activities like: singing for/with child, engaged in play, taken outside home, told stories etc.

Feeding practice was also assessed by using indicators for assessing Infant and Young Child Feeding (breastfeeding and complementary feeding practices) and a 24 Hour dietary recall.

Nutritional status of children was measured by taking anthropometric measurements using Seca weighing scale to measure weight, infant meter for length and MUAC tape for MUAC), recording age in months and the sex of child.

3.14 Anthropometric Measurements

Length: Measurement was based on lying length. Length measurement was carried out for children less than two years old. The length was measured and reported to the nearest cm using an Infant meter.

Weight: The weight was recorded to the nearest 0.1 kg. Weight was ideally assessed with the child wearing no clothing or only one layer of undergarments. The weight was determined using hanging weighing pants and a Salter scale for measuring children's weight.

MUAC: For using the child's left arm, the mid-upper arm circumference was measured. To make a right angle, the arm was bent at the elbow. A MUAC tape was placed on the tip of the shoulder at zero, as shown by the two arrows, and pulled to the tip of the elbow. A pen was used to mark

the midpoint of the arm. After that, the arm was straightened, the tape was wrapped around the marked area, and the reading was taken twice to get an average.

Age: Information on age was gotten from the weighing card or similar document, with verbal confirmation of date of birth from the mother/caregiver. Age was recorded in months.

3.15 Recruitment and Training of research Assistants

Three enumerators were recruited based on ability to read, write and able to speak Dagbani. The training took three days and areas covered were study objectives, interviewing technique and skills, anthropometric measurements and the filling of the questionnaires. To ensure high-quality data collection, the research assistants were properly trained and closely supervised. Every morning, the weighing scales were checked for accuracy and calibrated. Every day, the questionnaires were checked for completion. Data collection devices were kept safely at the facilities.

3.16 Data Analysis

Data was exported into Microsoft Excel and then transferred to IBM SPSS version 26 to perform analysis. The data was cleaned by running frequencies for all variables to find errors and missing values. Descriptive statistics were used to determine frequencies and percentages of responsive care and feeding practices. The WHO Anthropometry software was used to convert age in months, weight and length of infants to weight-for-age (underweight), length-for-age (stunting) and weight-for-length (wasting) respectively. Chi-square test was used to find the association between maternal and child characteristics and nutritional status of children. Bivariate and multiple logistic regression were used to establish factors associated with nutritional status of children.

3.17 Ethical Consideration

Ethical clearance was acquired from the Kwame Nkrumah University of Science and Technology Ethics Review Committee (CHRPE/AP/233/22). The Sagnarigu Municipal Health Directorate was also approached for permission to conduct the study. Participation in the study was voluntary with participants informed of the aim of the study and their rights to withdraw at any point of the interview.

CHAPTER FOUR

RESULTS

Introduction

This part shows the main results of the study in the Sagnarigu municipal. The result comprise; the background and socio-demographic characteristics of respondents and children, nutritional status of children, responsive care practices, feeding practices, association between nutritional status and demographic characteristics and association between responsive care and feeding, and nutritional status of children.

4.1 Background and Socio-demographic Characteristics of Respondents

The results of the study were based on two hundred and seventy participants. Majority of the respondents were married (98.5%) with just 0.4% of them being single. Many of the participants were within the ages 26-30 years (45.2%) and age group less than 19 were the least with 7%. Majority had no formal education at all (31.9%) and very few of the participants had some SHS level of education (11.1%). Dagombas were the majority among the ethnic groups that is 71.1% and Gonjas being the least among the ethnic groups (4.1%). Many of the mothers/ caregivers who participated in the study had some form of employment ranging from trading to other jobs like sewing, hairdressing, weaving among others, teaching and health workers. A good number of the participants were traders (31.1%) and those weaving or cleaning represented 0.7%, 0.7% of the participants respectively. Islam dominated as the religion with the highest percentage (85.6%) with 14.4 percentage belonging to Christianity. Majority of the children whose nutritional status were assessed, were females (53.3%) and 46.7 percent male children. Most of the children were within the age range 13-24 months (51.9%).

Table 2: Background and socio-demographic characteristics

Variable	Frequency	Percentage (%)
Age		
Less than 19	2	7
20-25	49	18.1
26-30	122	45.2
31-35	54	20.0
>35	43	15.9
Religion		
Christianity	39	14.4
Islam	231	85.6
Marital Status		
Married	266	98.5
Single	1	0.4
Widow	3	1.1
Ethnicity		
Dagomba	192	71.1
Gonja	11	4.1
Mamprusi	23	8.5
Waala	14	5.2
Others	30	11.1
Level of Education		
None	86	31.9
Primary	33	12.2
JHS	41	15.2
SHS	30	11.1
Tertiary	80	29.6
Occupation		
Health worker	24	8.9
Housewife	49	18.2
Hairdresser	21	7.8
Seamstress	38	14.1
Student	11	4.1
Teacher	39	14.4
Trader	84	31.1
Weaving	2	0.7
Cleaner	2	0.7
Sex of child		
Female	144	53.3
Male	126	46.7
Age of child		
6-8 months	65	24.1
9-12 months	65	24.1

13-24 months	140	51.9
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4.2 Breastfeeding practices of mothers/ caregivers

This part provides records on the breastfeeding practices of the 270 mothers/caregivers who had children between the ages 6 to 24 months and participated in the study. This is presented in table 3 below.

All 270 (100%) children of mothers/caregivers who participated in this study had ever been breastfed, and 83.3% were still breastfeeding at the time the study was conducted. The study's findings revealed, only about half of the mothers (50.4%) practiced exclusive breastfeeding, and majority of the mothers (44.4%) who had stopped breastfeeding weaned their children between 19 and 23 months old at the time of the study.

Table 3: **Breastfeeding practices of mothers/ caregivers**

Variable	Frequency	Percent (%)
Breastfeeding status		
Still breastfeeding		
Yes	225	83.3
No	45	16.7
Exclusive breastfeeding		
Yes	136	50.4
No	134	49.6
Breastfeeding duration		
Less than 18 months	7	15.6
18 months	11	24.4
19 to 23 months	20	44.4
24 months and above	7	15.6

4.3 Age water/other liquids was introduced to children 6 to 24 months

Based on the findings from the study, roughly half of the mothers/caregivers initiated water to their children at 6 months, with only about 17.0% introducing water to their children as early as between 0 to 2 months old. Nearly half of the mothers/caregivers (49.6%) gave water at 6 months because it was a hospital advice hospital advice or because they were practicing exclusive breastfeeding; others gave reasons such as child crying, baby was thirsty, insufficient breast milk, suckling issues, and so on as reasons for giving water.

Table 4: Times when water/other liquids were introduced

Times in months	Frequency	Percentage (%)
0-2 months	46	17.0
3-5 months	88	32.6
6 months	136	50.4

4.3 Complementary feeding practices of mother/caregiver

According to the study, around 81.5% of the mothers/caregivers had started complementary feeding with more than half (58.5%) of them initiating complementary feeding at 6 months and only 9.3% introducing complementary foods at 5 months or below. More than half 60% of the children were given with diversified meals, with 50.4% of the children being fed frequently. However, only 33.0% of those assessed met the minimum acceptable diet score.

Table 5: Complementary feeding practices of mothers/caregivers

Variable	Frequency	Percentage
Have you initiated complementary feeding		
Yes	220	81.5
No	50	18.5
Introduction of complementary feeding		
5 months and below	25	9.3
6 months	158	58.5
7 months and above	37	13.7
Not yet started	50	18.5
Minimum Dietary Diversity		
Yes	162	60.0
No	108	40.0
Minimum Meal Frequency		
Yes	136	50.4
No	134	49.6
Minimum Acceptable Diet		

Yes	89	33.0
No	181	67.0

4.4 Responsive care practices of mothers/caregivers

Less than half 47.4% of the mothers/caregivers practiced responsive care. This was assessed by asking mothers whether they sing, play, tell stories to the child or take the child outside home and who engage the child, objects the child plays with, how often the child is being less under the care of someone less than 15 years etc. Among the total number of mothers/caregivers 47.4% who practiced responsive care, about 47.9% of them had female children and 46.8% males. And among the 47.4% of mothers who practiced responsive care, most of them (46.9%) had children between the ages 13-24 months, 31.0% between 6-8 months and just 21.9% of them had children between 9-12 months. This is shown in table 6 below.

Table 6: Responsive care practices of mothers/caregivers

Variable	Total	Female	Male	6-8	9-12	13-24
	n=270	n= 144	n= 126	months	months	months
Responsive care						
Yes	128 (47.4%)	69 (47.9%)	59 (46.8%)	40 (31.0%)	28 (21.9%)	60 (46.9%)
No	142 (52.6%)	75 (52.1%)	67 (53.2%)	25 (17.6%)	37 (26.1%)	80 (56.3%)

4.5 Association between responsive care and socio-demographic factors of mothers/caregiver

Mother's socio-demographic characteristics was cross tabulated with responsive care. Close to half of the mothers/caregivers who were married 47.7% practiced responsive care with 0% of single mothers practicing responsive care. All the mothers 100% age less than 19 years practiced responsive care and only 37.0% of mothers aged between 31-35 years practiced responsive caregiving. Among mothers/caregivers who attained Tertiary level of education, 78.8% of them were doing responsive care with just a few of the mothers with primary education 24.2% practicing it. Majority of the mothers 85.0% who were teachers practiced responsive care and less than half 34.7% of the mothers who were housewives, practiced responsive care. No association existed between mothers' marital status, age of mother and responsive care. However, there was a significant association between mother's level of education, occupation of mother and responsive care ($p= 0.000$).

Table 7: Association between responsive care and socio-demographic characteristics of mothers/caregivers

Variable	Responsive care		P – value
	Yes	No	
Marital status			
Married	127 (47.7%)	139 (52.3%)	p= 0.562
Single	0 (0.00%)	1 (100.0%)	
Widow	1 (33.3%)	2 (66.7%)	
Age			
Less than 19	2 (100.0%)	0 (0.00%)	p= 0.288
20-25	25 (51.0%)	24 (49.0%)	
26-30	60 (49.2%)	62 (50.8%)	
31-35	20 (37.0%)	34 (63.0%)	
Greater than 35	21 (48.8%)	22 (51.2%)	
Level of education			
None	27 (31.4%)	59 (68.6%)	P= 0.000
Primary	8 (24.2%)	25 (75.8%)	
JHS	19 (46.3%)	22 (53.7%)	
SHS	11 (36.7%)	19 (63.3%)	
Tertiary	63 (78.8%)	17 (21.3%)	
Occupation			
Health worker	20 (83.3%)	4 (16.7%)	
Teacher	33 (85.0%)	6 (15.0%)	
Student	5 (45.5%)	6 (54.5%)	

Trader	32 (38.1%)	52 (61.9%)	
Housewife	17 (34.7%)	32 (65.3%)	P= 0.000
Hairdresser	4 (19.0%)	17 (81.0%)	
Seamstress	14 (36.8%)	24 (63.2%)	
Weaver	2 (100.0%)	0 (0.00%)	
Cleaner	1 (50.0%)	1 (50.0%)	

4.6 Nutritional Status of Children 6-24month

This part provides results on nutritional status of children 6-24 months who were part of the study. The prevalence of underweight, stunting and wasting were 17.0%, 15.9% and 11.1% correspondingly. Underweight was prevalent among children aged 6 to 24 months in general. The findings of this study showed that, of the 17.0% underweight children, 52.2% were females and 47.8% were males. The rate of stunting 15.9% was higher among females (51.2%) as compared to that of males (48.8%). And prevalence of wasting too was similarly higher among females (63.3%) than in males (36.7%). This is shown in the tables below.

Table 8: Nutritional status of children 6 to 24 months in Sagnarigu Municipal

Variable	Frequency	Percentage
Nutritional status		
Underweight	46	17.0
Stunted	43	15.9
Wasted	30	11.1

Table 9: Prevalence of child under nutrition (Underweight, Stunting and Wasting) by sex of child.

Variable	Total n= 270	Female n= 144	Males n= 126
Underweight			
Normal	224 (83.0%)	120 (53.6%)	104 (46.4%)
Underweight	46 (17.0)	24 (52.2%)	22 (47.8%)
Stunting			
Normal	227 (84.1%)	122 (53.7%)	105 (46.3%)
Stunted	43 (15.9%)	22 (51.2%)	21 (48.8%)
Wasting			
Normal	240 (88.9%)	125 (52.1%)	115 (47.9%)
Wasted	30 (11.1%)	19 (63.3%)	11 (36.7%)

4.7 Association between socio-demographic characteristics and nutritional status of children

6-24 months

Mother/caregiver socio-demographic characteristics were cross tabulated with nutritional status of the children. Mothers within the ages of 20-25 years had the highest number of underweight children. The rate of underweight was high (16.9%) among mothers who were married and 26.8% of mothers with JHS level also having the highest prevalence among the educational level factor of mothers. Also, prevalence of underweight was high in children between the ages 13-24 months with 52.2% of all underweight children being females. However, there was no significant association between various socio-demographic characteristics and underweight. This is shown in table 10 below.

Prevalence of stunting was high among mothers within the ages 26-30 (14.8%) and 16.2% of married mothers with children 6-24 months had stunted children. Lastly, 24.2% of mothers who attained primary level of education had the highest number of stunted children.

Most of the stunted children 46.7% were within the ages 13-24 months with about half 51.2% of the stunted children being females. There was no significance between demographic factors and stunting. This is represented in table 11 below.

The prevalence of child wasting was high among mothers aged greater than 35 years (16.3%), with 11.3% of married mothers having wasted children and 13.7% of mothers with tertiary education having the highest prevalence of wasted children. The number of wasted children was similarly high among children aged 13-24 months and more than half 63.3% of all wasted children were females. There was no significant association between wasting and demographic factors. This is presented in table 12 below.

Table 10: Association between socio-demographic factors and underweight

Variable	Underweight		P - value
	Normal	Underweight	
Age of mother/caregiver in years			
Less than 19	2 (100%)	0 (0.0%)	
20-25	37 (75.5%)	12 (24.5%)	
26-30	103 (84.4%)	19 (15.6%)	P= 0.520
31- 35	47 (87.0%)	7 (13.0%)	
Greater than 35	35 (81.4%)	8 (18.6%)	
Marital status of mother/caregiver			
Married	21 (83.1%)	45 (16.9%)	
Single	0 (0.00%)	1 (100.0%)	P = 0.064
Widow	3 (100.0%)	0 (0.00%)	
Mother/caregivers level of education			
None	77 (89.5%)	9 (10.5%)	
Primary	27 (81.8%)	6 (18.2%)	
JHS	30 (73.2%)	11 (26.8%)	P = 0.230
SHS	25 (83.3%)	5 (16.7%)	
Tertiary	65 (81.3%)	15 (18.7%)	
Age of child			
6-8 months	51 (22.8%)	14 (30.4%)	
9-12 months	54 (24.1%)	11 (23.9%)	P= 0.511
13-24 months	119 (53.1)	21 (45.7%)	

Sex of child			
Female	120 (53.6%)	24 (52.2%)	
Male	104 (46.4%)	22 (47.8%)	P= 0.863

Table 11: Association between mothers/caregivers characteristics and stunting

Variable	Stunting		P – value
	Normal	Stunted	
Age of mother/caregiver			
Less than 19	1 (50.0%)	1 (50.0%)	P = 0.389
20-25	43 (87.8%)	6 (12.2%)	
26-30	104 (85.2%)	18 (14.8%)	
31- 35	46 (85.2%)	8 (14.8%)	
Greater than 35	33 (76.7%)	10 (23.3%)	
Marital status of mother/caregiver			
Married	233 (83.8%)	43 (16.2%)	P = 0.681
Single	1 (100.0%)	0 (0.00%)	
Widow	3 (100.0%)	0 (0.00%)	
Mother/caregivers level of education			
None	78 (90.7%)	8 (9.3%)	P = 0.153
Primary	25 (75.8%)	8 (24.2%)	
JHS	33 (80.5%)	8 (19.5%)	
SHS	27 (90.0%)	3 (10.0%)	
Tertiary	64 (80.0%)	16 (20.0%)	
Age of child			
6-8 months	54 (23.8%)	11 (25.6%)	P= 0.726
9-12 months	53 (22.3%)	12 (27.9%)	
13-24 months	120 (52.9%)	20 (46.7%)	

Sex of child			
Female	122 (53.7%)	22 (51.2%)	P= 0.756
Male	105 (46.3%)	21 (48.8%)	

Table 12: Association between mothers/caregivers characteristics and wasting

Variable	Wasting		P – value
	Normal	Wasted	
Age of mother/caregiver			
Less than 19	2 (100.0%)	0 (0.00%)	P= 0.581
20-25	42 (85.7%)	7 (14.3%)	
26-30	110 (90.2%)	12 (9.8%)	
31-35	50 (92.6%)	4 (7.4%)	
Greater than 35	36 (83.7%)	7 (16.3%)	
Marital status			
Married	236 (88.7%)	30 (11.3%)	P= 0.776
Single	1 (100.0%)	0 (0.00%)	
Widow	3 (100.0%)	0 (0.00%)	
Level of education			
None	78 (90.7%)	8 (9.3%)	P= 0.899
Primary	30 (90.9%)	3 (9.1%)	
JHS	36 (87.8%)	5 (12.2%)	
SHS	27 (90.0%)	3 (10.0%)	
Tertiary	69 (86.3%)	11 (13.7%)	
Age of child			
6-8 months	58 (24.2%)	7 (23.3%)	P= 0.985
9-12 months	58 (24.2%)	7 (23.3%)	
13-24 months	124 (51.6%)	16 (53.4%)	

Sex of child			
Female	125 (52.1%)	19 (63.3%)	P= 0.244
Male	115 (47.9%)	11 (36.7%)	

4.8 Association between Minimum Dietary Diversity, Minimum Meal Frequency and Minimum Acceptable Diet and Responsive care

Responsive was cross tabulated with minimum dietary diversity, minimum meal frequency and minimum acceptable diet. Among mothers who practiced responsive care, 66.4% of their children met the minimum dietary diversity, 55.5% also met the minimum meal frequency with just 40.6% of their children meeting the minimum acceptable diet.

There was a significant association between responsive care and minimum dietary diversity and minimum acceptable diet ($p= 0.041$, $p= 0.011$). However, there was no statistically significant relationship between responsive care and minimum meal frequency.

Table 13: Association between Minimum Dietary Diversity, Minimum Meal Frequency and Minimum Acceptable Diet and Responsive care

Variable	MDD		P – value
	Yes	No	
Responsive care			
Yes	85 (66.4%)	43 (33.6%)	P= 0.041
No	77 (54.2%)	65 (45.8%)	
MMF			
Responsive care			
Yes	71 (55.5%)	57 (44.5%)	P= 0.112
No	65 (45.8%)	77 (54.2%)	
MAD			
Responsive care			
Yes	52 (40.6%)	76 (59.4%)	P= 0.011
No	37 (26.1%)	105 (73.9%)	

4.9 Association between socio-demographic factors and MDD, MMF and MAD

Socio-demographic factors was cross tabulated with minimum dietary diversity, minimum meal frequency and minimum acceptable diet to see the associations. Majority of mothers 74.1% within the age brackets 31-35 years fed their children with variety of foods and about 60.5% of married mothers had children who met the minimum dietary diversity. Most of the mothers with tertiary level of education 75.0% had the highest number of children who met the minimum dietary diversity.

Majority of children aged between 13-24 months 71.4% met the minimum dietary diversity and 64.6% of the female children also met the minimum dietary diversity. There was a significant association between mother's educational level and age of child and minimum dietary diversity. This is shown in table 14 below.

The number of children who met the minimum meal frequency was high 59.3% among mothers between 31-35 years and about half 50.4% of married mothers also had the highest number of children who were given frequent meals. The level of education with the highest number of children meeting the minimum meal frequency were mothers with tertiary education (57.5%). Many of the children 63.1% within the ages 6 to 8 months were given food in the required number of times with about 56.9% of the children who were given the recommended number of foods were females. There was a significant association between the child's sex only and minimum meal frequency. This is shown in table 15 below.

Children who received minimum acceptable diet was high among mothers aged 31-35 years (48.1%) and among married mothers 33.5%. Mothers who attained tertiary level of education had

most 45.0% of their children meeting the minimum acceptable diet. Less than 50 percent of children in all the age groups met the minimum acceptable diet 33.8%, 33.8% and 32.1% respectively. There was an association between age of mother, mother’s level of education and sex of child, with minimum acceptable diet. This is presented in table 16 below.

Table 14: Association between socio-demographic factors and MDD

Variable	MDD		P – value
	Yes	No	
Age of mother			
Less than 19	1 (50.0%)	1 (50.0%)	
20- 25	28 (57.1%)	21 (42.9%)	
26- 30	69 (56.6%)	53 (43.4%)	P= 0.229
31- 35	40 (74.1%)	14 (25.9%)	
Greater than 35	24 (55.8%)	19 (44.2%)	
Marital status			
Married	161 (60.5%)	105 (39.5%)	
Single	0 (0%)	1 (100%)	P= 0.298
Widow	1 (33.3%)	2 (66.7%)	
Educational status			
None	46 (53.5%)	40 (46.5%)	
Primary	20 (60.6%)	13 (39.4%)	P= 0.018
JHS	22 (53.7%)	19 (46.3%)	
SHS	14 (46.7%)	16 (53.3%)	

Tertiary	60 (75.0%)	20 (25.0%)	
Age of child			
6-8 months	27 (41.5%)	38 (58.5%)	
9- 12 months	35 (53.8%)	30 (46.2%)	P= 0.000
13- 24 months	100 (71.4%)	40 (28.6%)	
Sex of child			
Female	93 (64.6%)	51 (35.4%)	P= 0.100
Male	69 (54.8%)	57 (45.2%)	

Table 15: Association between socio-demographic factors and MMF

Variable	MMF		P – value
	Yes	No	
Age of mother			
Less than 19	1 (50.0%)	1 (50.0%)	
20- 25	20 (40.8%)	29 (59.2%)	
26- 30	67 (54.9%)	55 (45.1%)	P= 0.112
31- 35	32 (59.3%)	22 (40.7%)	
Greater than 35	16 (37.2%)	27 (62.8%)	
Marital status			
Married	134 (50.4%)	132 (49.6%)	
Single	1 (100%)	0 (0%)	P= 0.513
Widow	1 (33.3%)	2 (66.7%)	
Educational status			
None	43 (50.0%)	43 (50.0%)	
Primary	10 (30.3%)	23 (69.7%)	
JHS	21 (51.2%)	20 (48.8%)	P= 0.133
SHS	16 (53.3%)	14 (46.7%)	
Tertiary	46 (57.5%)	34 (42.5%)	
Age of child			
6-8 months	41 (63.1%)	24 (36.9%)	
9- 12 months	31 (47.7%)	34 (52.3%)	P= 0.061
13- 24 months	64 (45.7%)	76 (54.3%)	

Sex of child			
Female	82 (56.9%)	62 (43.1%)	P= 0.021
Male	54 (42.9%)	72 (57.1%)	

Table 16: Association between socio-demographic factors and MAD

Variable	MAD		P – value
	Yes	No	
Age of mother			
Less than 19	0 (0%)	2 (100%)	
20- 25	13 (26.5%)	36 (73.5%)	
26- 30	43 (35.2%)	79 (64.8%)	P= 0.010
31- 35	26 (48.1%)	28 (51.9%)	
Greater than 35	7 (16.3%)	36 (83.7%)	
Marital status			
Married	89 (33.5%)	177 (66.5%)	
Single	0 (0%)	1 (100%)	P= 0.369
Widow	0 (0%)	3 (100%)	
Educational status			
None	26 (30.2%)	60 (69.8%)	
Primary	6 (18.2%)	27 (81.8%)	
JHS	13 (31.7%)	28 (68.3%)	P= 0.053
SHS	8 (26.7%)	22 (73.3%)	
Tertiary	36 (45.0%)	44 (55.0%)	
Age of child			
6-8 months	22 (33.8%)	43 (66.2%)	
9- 12 months	22 (33.8%)	43 (66.2%)	P= 0.957
13- 24 months	45 (32.1%)	95 (67.9%)	

Sex of child			
Female	56 (38.9%)	88 (61.1%)	P= 0.027
Male	33 (26.2%)	93 (73.8%)	

4.10 Association between responsive care and feeding practices and the nutritional status of children 6-24 months in Sagnarigu Municipal

Table 17 shows results of the regression analysis for responsive care and feeding practices of mothers and the nutritional status of children. Bivariate analysis on the various forms of under nutrition: underweight, stunting and wasting were performed to check for correlation between responsive care and feeding practices such as, age water was introduced to the child, age complementary foods were introduced, minimum dietary diversity, minimum meal frequency and minimum acceptable diet etc. but only stunting showed correlation.

Minimum dietary diversity (MDD) was found to be significantly associated with stunting [AOR= 0.252; 95% CI (0.079, 0.808); p= 0.020], those who did not meet the dietary diversity requirements were 75.0% less likely to be stunted. Other factors like MMF, MAD, responsive care, age water was introduced to child, and age complementary foods were initiated did not show any association with stunting.

Table 17: Regression analysis to show association between responsive care and feeding practices and nutritional status (stunting) of children 6-24 months

Factors	P-value	Adjusted Odds Ratio (adjusted OR)	95% C.I.for adjusted OR	
			Lower	Upper
Responsive care Index				
No	Reference			
Yes	0.252	0.661	0.325	1.342
Age water was introduced to child				
0-2 months	Reference			
3-5 months	0.567	1.331	0.500	3.542
6 months	0.115	1.878	0.857	4.117
Age complementary foods were introduced				
5 months and below	Reference			
6 months	0.159	0.276	0.046	1.652
7 months and above	0.851	1.109	0.376	3.271
Not yet started	0.220	0.388	0.086	1.760
Minimum Dietary Diversity				
No	Reference			
Yes	0.020	0.252	0.079	0.808
Minimum Meal Frequency				
No	Reference			
Yes	0.288	0.494	0.134	1.816
Minimum Acceptable Diet				
No	Reference			
Yes	0.155	2.988	0.661	13.512
Age of child				
6-8 months	Reference			
9-12 months	0.367	1.553	0.597	4.038
13-24 months	0.191	1.807	0.744	4.388
Sex of child				
Male	Reference			
Female	0.515	1.260	0.629	2.525
Constant	0.003	0.155		

CHAPTER FIVE

DISCUSSION OF RESEARCH RESULTS

Introduction

This part presents discussions of the result from a facility-based cross-sectional study conducted among 270 mothers with children 6-24 months at Sagnarigu municipal in the Northern part of Ghana. This study was aimed at assessing responsive care and feeding practices of mothers/caregivers and the nutritional status of children 6-24 months in the Sagnarigu municipality. The discussions were done as follows: socio-demographic characteristics of mothers and their children, responsive care, feeding practices of mothers/caregivers which includes; breastfeeding and complementary feeding practices, nutritional status of children 6-24 months, the association between mothers/caregiver and child characteristics and the association between nutritional status, responsive care and feeding practices.

5.1 Socio-demographic characteristics

This study demonstrated that just a few 15.9% of the mothers were aged greater than 35 with 84.1% falling between the ages bracket 18-35. This is almost similar to the findings from a study in Northern Ghana by Saaka et.al which presented that majority of the mothers 81.8% are between the ages of 18-35 (Saaka et al., n.d.).

The study's findings displayed that, most of the children were within the age brackets 13-24 months which is almost the same as findings of a study in northern Ghana which revealed that majority of the children to be between the ages 12-23 months (Saaka et al., n.d.). Also, a study by

Ali et.al showed a similar findings where majority of the children fell between the ages 12-23 months (Ali et al., 2017).

5.2 Responsive care practice

The World Health Organization (WHO) in May 2018, introduced the Nurturing Care Framework (NCF) which proclaim that for a child to survive and thrive, holistic care which includes; responsive care, adequate nutrition, good health, opportunities for early learning, security and safety is essential (WHO, 2019). Though several interventions and programs have been launched in Ghana, particularly in the North where malnutrition is very high, to address early childhood development and nutrition challenges only 47.4% of the mothers included in this study practiced responsive care.

5.3 Breastfeeding feeding practices

World Health Organization recommends optimal breastfeeding feeding of infants and this include; early initiation within first hour after birth, exclusive breastfeeding for first 6 months and continued breastfeeding after 6 months with complementary family foods until 2 years or beyond.

This study confirmed that, prevalence of exclusive breastfeeding of children for the first six months was 50.4% confirming the findings of the GDHS report that half of the children 0-6 months in Ghana are exclusively breastfed (GDHS, 2014). This is also very close to the 56.0% of children 0-6 months exclusively breastfed in Northern region as reported by Ghana Statistical Service (GSS, 2019). This shows much progress being made towards achieving the global exclusive breast feeding target for 2025 to be at least 50% (WHO, 2017) and a little bit under way in achieving the

collective global breastfeeding target of 70% rate of exclusive breastfeeding of infants 0-6months by 2030 (WHO and UNICEF, 2021). However, this is also a bit higher than the national rate of exclusive breastfeeding of children for the first 6months in Ghana 43.0% according to the Ghana: Nutrition profile (USAID, 2021) and the global rate of only 44% of infants under 6 months being exclusively breastfed between 2013-2018 (WHO and UNICEF, 2021). The 50.4 % rate of exclusive breastfeeding confirmed in this study could be attributed to the fact that, more than 50% of the mothers in Saganarigu Municipal included in the study were non-government who probably didn't have anything interfering with their breastfeeding practices as compared to government workers whose breastfeeding practices are mostly interrupted by duties from work. Some of the mothers who did not practice exclusive breastfeeding introduced water to their children as early as between the ages of 0-2 months (17.0%).

About 81.3% of the mothers didn't practice exclusive breastfeeding because they starting giving water to their infants before 6 months and just a few 18.7% introduced other feeds like formula feeds to infants less than 6 months. Some of the reasons given by mothers for the introduction of water and/or other feeds to the child were; breastfeeding difficulties, peer or family influence, mother felt child was thirsty, cultural practices, hot weather etc.

The study revealed that, most of the mothers 44.4% in Sagnarigu municipal who had weaned their children, terminated breastfeeding between the ages 19-23 months. Only 15.6% continued breastfeeding till 24 months which contradicts with the 83.2% of continued breastfeeding till 2 years in Northern region reported by GSS (GSS, 2019).

All the 270 children included in this study were ever breastfed similar to percentage of ever breastfed children in Northern region 98.9% by GSS between 2017 and 2018 (GSS, 2019). Similar results has been recorded in a study that was carried out in Nairobi Kenya which found that, almost

all children 99.0% had ever been breastfed (Kimani-Murage et al., 2011). This is also similar to the findings from the Ghana Demographic and Health Survey report with 98.0% children in Ghana ever breastfed (GDHS, 2014).

5.4 Complementary feeding practices

Complementary or family foods and liquids need to be introduced to the child at 6 months as recommended by the WHO since nutrient requirements of the child starts to surpass what the breast milk by itself can provide. This exposes them to malnutrition unless age appropriate solid foods are introduced with continued breastfeeding until 2 years and beyond. Infant and young child feeding for children under 2 years is crucial to enhance nutrition, health and development of children which eventually determines a child's survival.

This study revealed that, most of the mothers 58.5% started complementary feeding on time that is at the sixth months, this is a bit higher compared to the 48.8% found by Saaka et.al in study done in rural Northern Ghana (Saaka et al., 2015). The difference could be because of the research setting that is rural/urban communities. In contrast, a study conducted in Indonesia for children 7-59 months revealed that, half of the participants 54.1% started giving complementary foods to their infants before 6 months (Palupi et al., 2019). Another findings from a study in Tanzania showed a contrary results where 91.2% of the mothers initiated complementary foods to their children before six months with only 8.8% of the mothers introducing complementary foods at the recommended 6 months (Id et al., 2021).

Over half (60.0%) of the 270 children aged 6 to 24 months met the required dietary diversity criteria, 50.4% for minimum meal frequency and just 33.0% me the minimum acceptable diet

score. This contrast with the 24.0% of children 6-23months in Ghana meeting the minimum dietary diversity score as presented by UNICEF (UNICEF, 2019). However, the 50.4% MMF reported in this study is close to the results of a research that was conducted in Tanzania among children 6-24months, where 59.7% of the children met the required meal frequency criteria (Id et al., 2021).

Also, according to findings from a study by Amoafu suggest that, minimum acceptable diet among children 6-23 months in Ghana was similarly low (13.0%) (Amoafu, 2016) which shows a decrease in the minimum acceptable diet score compared with 12.8% reported by the GSS for children 6-23months in 2019 (GSS, 2019).

5.5 Nutritional Status of children

Malnutrition, especially under nutrition among children below five years is a serious public health concern. Globally, at least one in every three children under the age of five is stunted, wasted or overweight as a result of malnutrition (Keeley et al., 2019) with one third of all malnourished children residing in Sub-Saharan Africa (Akombi et al., 2017). The prevalence of under nutrition have increased from 8.4% to 9.9% between 2018/2019 (UN, 2020).

It was discovered from the data analysis that, the rate of underweight, stunting and wasting were 17.0%, 15.9% and 11.1% respectively. This contrast with the findings of a research in Sub-Saharan Africa which stated that, overall the prevalence of stunting, underweight and wasting was, 28.6%, 16.4% and 9.4% respectively (Aboagye et al., 2021). Although the prevalence differ but wasting is shown be similarly low compared to this study, however, the difference observed could be because the data was pooled form different countries. Whiles results from this study is from a section of people in Sagnarigu municipal, Ghana. Also, the proportion of under nourished children

6-24 months in Northern Tanzania found, was lower except for stunting which was 20.7%, but wasting remained the lowest with 8.9% prevalence (Id et al., 2021) similar to the findings of this study analysis. The observed differences could be attributed to the fact that this study was a cross-sectional study, whereas the study in Northern Tanzania was a cohort study with a minimal recall bias.

A similar prevalence of nutritional status was found in a study by Saaka et al for children aged 6-23 months, with about 21%, 12%, and 21.1% of the study population being stunted, wasted, and underweight, correspondingly (Saaka et al., 2015).

5.6 Association between responsive care, feeding practices of mothers/caregivers and nutritional status of children

The study revealed that, there was no significant association between responsive care and feeding practices except for stunting and minimum dietary diversity. A study in Indonesia showed a similar results of no association between feeding practices and nutritional status of children (Palupi et al., 2019).

According to the study, children who did not meet the required dietary diversity were 74.8% less likely to be stunted, which is in line with the results of a study conducted in low-income countries and Northern Tanzania, which found that MDD was associated with a lower probability of stunting (Marriott et al., 2012). In contrast, Id et.al found that, children with low Minimum Dietary Diversity were more likely to be stunted (Id et al., 2021). On the other hand, a study in Malawi study found a significant link between MMF and MAD and being underweight, with

children who met both MMF and MAD being less likely to be underweight but not stunting (Walters et al., 2019).

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1 Summary of key findings

Overall, only 47.4% of mothers practiced responsive care, indicating a low level of practice. Most of the female children 47.9% received responsive care compared to males and 46.9% of children aged 13-24 months were those that received responsive care more than the other child age groupings. Responsive care was significantly associated with minimum dietary diversity and minimum acceptable diet ($p= 0.041$ and $p= 0.011$). There was no association between responsive care and underweight, stunting, or wasting; however, responsive care was significantly associated with level of education and occupation of the mother ($p= 0.000$). Interventions to improve responsive care practice in order for children to thrive and survive are crucial.

There was a fair practice of feeding practices among mothers/caregivers, as 50.4% of them practiced exclusive breastfeeding with all children 100% ever breastfed and about half 50.4% of the mothers introducing water/ other liquids in the sixth month of the child. Majority weaned their babies off the breast between the ages of 19-23 months, which is close to the recommended 2 years and beyond; however, improvements can be made toward practicing the WHO recommended optimal breastfeeding by empowering mothers to understand and appreciate the need to optimally breastfeed their babies.

Furthermore, 81.5% of the mothers had already initiated complementary feeding. More than half of the mothers were found to initiate complementary feeding on time, with 60.0% and 50.4% of children aged 6 to 24 months meeting the minimum dietary diversity and meal frequency, respectively. However, only 33.0% of the children met the minimum acceptable dietary criterion. Socio-demographic factors: educational level and age of child was reported to be significantly related with minimum dietary diversity ($p= 0.018$ and $p= 0.000$). Only sex of child was found to be significantly associated with meal frequency ($p= 0.021$) while age of mother and sex of child

were also found to be significantly associated with minimum acceptable diet ($p= 0.010$ and $p= 0.027$).

The prevalence of underweight, stunting and wasting were 17.0%, 15.9% and 11.1% appropriately. All the undernutrition indicators was high in children between 13-24 months and high among female children aged 6- 24months than in males. Maternal and child characteristics like marital status, age, level of education and occupation showed no association with the nutritional status of the children.

6.2 Conclusion

From the information gathered on breastfeeding and complementary feeding practices, some gaps still exist that need to be filled. According to findings from the breastfeeding practices, some mothers still do not understand the importance of exclusively breastfeeding their babies for the first 6 months of the baby's life. The less than half percent of Minimum Acceptable Diet recorded could be due to the children being sub optimally fed with complementary foods. This can also be attributed to the fact that, some mothers/caregivers lack the knowledge and skills to use locally available foods to be able to optimally practice complementary foods in their right frequencies and varieties. In general, nutritional status was good considering the lower prevalence of stunting and underweight recorded in this study compared to prevalence in previous years.

6.3 Recommendation

There is the need to educate parents and caregivers on how to stimulate their children's development to survive and thrive since the assessment of responsive care showed majority of the

mothers/caregiver practices were non-responsive. Also, mothers/caregivers need to be enlightened on the need to practice optimal infant and young child feeding practices as recommended and how to use locally available foods to practice appropriate complementary feeding. There was no significant association between responsive care and feeding practices, and nutritional status of children 6-24 months, however, there were some gaps in responsive care and feeding practices. Therefore, there is the need to;

- ✓ Ministry of Health and Ghana Health Service should train frontline health worker; nutritionist, midwives, community health workers to incorporate responsive care in their work to effectively teach mothers/caregivers with children 6-24months responsive care giving and how to stimulate their children.
- ✓ Ministry of Health and Ghana Health Service should engage stakeholders in formulating policy guidelines and initiatives for early child development (responsive care) in the district. Investing in early childhood will increase the chances of achieving good health and well-being SDG 3.
- ✓ Further studies are recommended to assess mothers/caregivers knowledge on responsive care and feeding practices to understand why majority of the mothers did not practice responsive care and just a few children meeting the minimum acceptable diet criteria.
- ✓ Ministry of Health ensure existing policies on optimal breastfeeding should be reinforced and effectively implemented in the district and the country at large. Especially the now very common inappropriate marketing of breast milk substitutes in the country. This can further increase the chances of achieving the prevalence of exclusive breastfeeding of more than 50.0% rate by 2025.

- ✓ Since minimum acceptable diet rate was low, Health workers should educate and empower mothers/caregivers to understand the importance of optimal infant and young child feeding practices and to prioritize using the locally available foods to feed their children.

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APPENDIX I

Questionnaire

Introduction

Good morning/afternoon/evening. My name is (Feruza Adam), and I am a final year student from University for Development Studies, school of Public Health. I am conducting a study titled “Assessing responsive care and feeding practices of mothers/caregivers and nutritional status of children 0-24 months” and would like to have an interview with you on your knowledge and practices towards infant and young child feeding and the nutritional status of your child. Everything we discuss would remain confidential and it shall be used only for the purpose of this research. I hope you will participate fully in this survey since your answers are important.

Shall we start now? Yes () No ()

Date: ____/____/2022

IDENTIFICATION

1. Name of Community.....
2. Questionnaire Number_____

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF MOTHERS

1. Age of mother.....years
2. What is your religion?
 - a. Christianity b. Islam c. Traditionalist d. Others (specify)
3. Marital status of mother/ caregiver
 - a. Single b. Married c. Separated d. Divorced e. Widow
4. Ethnicity of mother/ caregiver

- a. Dagomba b. Mamprusi c. Waala d. Gonja e. Others

(specify).....

5. Occupation of mother/ caregiver

6. What is your level of education?

- a. Primary b. JHS c. SHS d. Tertiary (specify)..... e. None

SECTION B: MOTHERS/CAREGIVERS PRACTICE OF INFANT AND YOUNG

CHILD FEEDING

7. Was (Name of child) ever breastfed?

- a. Yes b. No

8. Is (name of child) still breastfeeding?

- a. Yes b. No

9. If No, for how many months did (name of child) breastfeed?

.....months

10. Was (Name of child) breastfed yesterday during the day or at night?

- a. Yes b. No

11. On the average how many times do you breastfeed (name of child) in a day?

.....times

12. How many times do you breastfeed during the night?

..... times

13. At what age did you start giving water to (Name of Child)?.....months

Why?

14. Have you started giving complementary foods to your child?

- a. Yes b. No

15. If yes to 14, at what age of the child did you start? Specify (Months)

16. What local complementary foods have you introduced to your child?

- a. Koko b. Tz c. Rice d. others specify.....

17. How many times do you give the child complementary foods in a day?

- a. 2 times b. 3 times c. 4 times

SECTION C: DIETARY INTAKE OF CHILD

Now I would like to ask you about liquids that (NAME) had yesterday during the day or at night.

Please tell me about all drinks, whether (NAME) had them at home, or somewhere else.

Yesterday during the day or at night, did (NAME) drink:

18. Plain water? a. Yes b. No c. Don't know

Tips for Question 20, 22 and 25: (if 7 or more times, record '7' and if number of times not known, record '99')

19. Infant formula such as [INSERT POPULAR FORMULA NAMES]? a. Yes b. No c.

Don't Know

20. IF YES: How many times did (NAME) drink infant formula? _____

21. Milk such as tinned, powdered, or fresh animal milk? a. Yes b. No c. Don't

know

22. IF YES: How many times did (NAME) drink milk? _____

23. IF YES: Was the milk a sweet or flavored type of milk? a. Yes b. No c.

Don't know

24. Yogurt drinks? a. Yes b. No c. Don't know

25. If Yes: How many times did (NAME) drink yogurt? _____

26. 26.If **Yes**: Was the yogurt drink a sweet or flavored type of yogurt drink?

a. Yes b. No c. Don't know

27. Chocolate flavored drinks? a. Yes b. No c. Don't know

28. Fruit juice or fruit-flavored drinks? a. Yes b. No c. Don't know

29. Sodas, malt drinks, sports drinks, or energy drinks?

a. Yes b. No c. Don't know

30. Tea, coffee, or herbal drinks? a. Yes b. No c. Don't know

31. IF YES: Was the drink sweetened? a. Yes b. No c. Don't know

32. Clear broth or clear soup? a. Yes b. No c. Don't know

33. Any other liquids? a. Yes b. No c. Don't know

34. IF YES: What was the drink? *Tip: Open response*

35. IF YES: Was the drink sweetened? a. Yes b. No c. Don't know

Minimum acceptable diet

ENUMERATOR ASK: Now I would like to ask you about semi solid foods that your child ate yesterday during the day and/or at night. I am interested in whether they ate the item even if it was combined with other foods. Please describe everything he or she ate yesterday during the day and/or night, whether at home or outside the home. Enumerators, please probe until respondent says child

went to sleep at night, starting with when the child wake up in the morning. For mixed dishes and soups/stews ask for the ingredients.

Tip: Select ‘Yes’ for all the food groups mentioned and when done asked caregiver if the child ate any meals from the food groups not mentioned and select the appropriate response.

36. Bread, rice, noodles, porridge or other foods made from grains (maize, millet, guinea corn/sorghum, wheat (kenkey, banku, koko, tuo zaafi, akple, “yama”)?

a. Yes b. No c. Don’t know

37. Pumpkin, red or yellow yams, carrots, sweet potatoes that are yellow or orange inside? a.

Yes b. No c. Don’t know

38. White potatoes, white yams, manioc, cassava, cocoyam, fufu or any other foods made from roots, tubers or plantain?

a. Yes b. No c. Don’t know

39. Any dark green, leafy vegetables (kontomire, aleefu, ayoyo, cassava & bean leaves, orange flesh sweet potato leaves, bra, moringa leaves, “gora”, pumpkin leaves, baobab leaves, okro leaves?

a. Yes b. No c. Don’t know

40. Ripe mangoes, pawpaw, dawadawa fruit flour?

a. Yes b. No c. Don’t know

41. Any other fruits or vegetables (e.g. bananas, avocados, tomatoes, oranges, apples)?

a. Yes b. No c. Don’t know

42. Any meat, such as beef, pork, lamb, chevon, chicken, guinea fowl or duck?

a. Yes b. No c. Don’t know

43. Eggs? a. Yes b. No c. Don't know

44. Fresh or dried fish or shellfish, such as "keta school boys (anchovies)" (e.g. prawn, lobster)? a. Yes
b. No c. Don't know

45. Any foods made from beans, peas, lentils, nuts, bambran beans, cowpea, Soybean or Soybean products (soy khebab) or seeds?

a. Yes b. No c. Don't know

46. Yoghurt (other than yogurt drinks), cheese (wagashie) or other milk products ?

a. Yes b. No c. Don't know

47. How many times did (name) eat solid, semi-solid, or soft foods yesterday during the day and night?

Tip: (IF 7 OR MORE TIMES, RECORD '7'. IF NUMBER OF TIMES NOT KNOWN, RECORD

'99') _____

SECTION D: MOTHERS/CAREGIVERS PRACTICE OF RESPONSIVE CARE AND FEEDING

48. How many children's books or picture books do you have for (name)?

49. I am interested in learning about the things that (name) plays with when (he/she) is at home.

Does (he/she) play with:

50. Homemade toys, such as dolls, cars, or other toys made at home?

a. Yes b. No c. Don't know

51. Toys from a shop or manufactured toys?

a. Yes b. No c. Don't know

53. Household objects, such as bowls or pots, or objects found outside, such as sticks, rocks, animal shells or leaves? a. Yes b. No c. Don't know

54. Sometimes do adults taking care of children have to leave the house to go shopping, wash clothes, or for other reasons and have to leave young children? **If yes**, on how many days in the past week was (name): **Response Options:** If 'None' record '0'. If 'Don't know' record '8'. 55. Left alone for more than an hour? Number of days left alone for > 1 hour _____

56. Left in the care of another child, that is, someone less than 10 years old, for more than an hour? Number of days left with another child for >1 hour _____

57. In the past 3 days, did you or any household member age 15 or over engage in any of the following activities with (name):

If 'Yes', ask: Who engaged in this activities below with (name)?

Tip: *A foster/step mother or father living in the household who engaged with the child should be coded as mother or father. Record all that apply, if one person is mentioned ask for who else. 'No one' cannot be recorded if any household member age 15 and above engaged in activity with child.*

58. Read books or looked at picture book with name? a. Yes, who? _____ b. No

59. Told stories to (name)? a. Yes, who? _____ b. No

60. Sang songs to or with (name), including lullabies? a. Yes, who? _____ b. No

61. Took (name) outside the home? a. Yes, who? _____ b. No

62. Played with (name)? a. Yes, who? _____ b. No

63. Named, counted, or drew things for or with (name)?

a. Yes, who? _____ b. No

SECTION E: NUTRITIONAL STATUS OF CHILD

Anthropometry Measurements of Child

Date of birth: ___/___/___ (dd/mm/yyyy)

Sex of child

a. Male b. Female

Weight of child: ___ . ___ (kg)

Length of child ___ . ___ (cm)

APPENDIX II



Kwame Nkrumah
University of Science
and Technology, Kumasi

College of Health Sciences
SCHOOL OF MEDICINE AND DENTISTRY

COMMITTEE ON HUMAN RESEARCH, PUBLICATION AND ETHICS

Our Ref: CHRPE/AP/233/22

31st May, 2022

Miss Adam Feruza
Department of Global and International Health
School of Public Health
University for Development Studies.
TAMALE

Dear Madam,

LETTER OF APPROVAL

Protocol Title: *“Assessing Responsive Care and Feeding Practices of Mothers/Caregivers and Nutritional Status of Children 6-24 Months in Sagnarigu Municipal.”*

Proposed Site: *Sagnarigu District.*

Sponsor: *Principal Investigator.*

Your submission to the Committee on Human Research, Publications, and Ethics on the above-named protocol refer.

The Committee reviewed the following documents:

- A notification letter from the Regional Health Directorate, Tamale
- (study site) indicating the approval for the conduct of the study at the Region.
- A Completed CHRPE Application Form.
- Participant Information Leaflet and Consent Form.
- Research Protocol.
- Questionnaire

The Committee has considered the ethical merit of your submission and approved the protocol. The approval is for a fixed period of one year, beginning **31st May, 2022** to **30th May, 2023** renewable thereafter. The Committee may, however, suspend or withdraw ethical approval at any time if your study is found to contravene the approved protocol.

Data gathered for the study should be used for the approved purposes only. Permission should be sought from the Committee if any amendment to the protocol or use, other than submitted, is made of your research data.

The Committee should be notified of the actual start date of the project and would expect a report on your study, annually or at the close of the project, whichever one comes first. It should also be informed of any publication arising from the study.

Thank you for your application.

Yours faithfully,

Rev. Prof. John Appiah-Poku.

Honorary Secretary
FOR: CHAIRMAN