MINIMUM MEAL FREQUENCY AND ASSOCIATED FACTORS AMONG CHILDREN AGED 6-23 MONTHS ATTENDING HEALTH CENTERS IN HARAR CITY, HARARI REGION, EASTERN ETHIOPIA

MPH THESIS

BEREKETABE NEGA (BSC)

DECEMBER, 2025
HARAMAYA UNIVERSITY, HARAR

Minimum Meal Frequency and Associated Factors among Children Aged 6-23 Months Attending Health Centers in Harar city, Harari Region, Eastern Ethiopia

A Thesis Submitted to the School of Public Health
Post Graduate Program Directorate
HARAMAYA UNIVERSITY

In Partial fulfillment of the requirement for the Degree of
MASTER OF PUBLIC HEALTH IN NUTRITION

Bereketabe Nega Gebru (BSc)

Major Advisor: Abdu Oumer (PhD)

Co-Advisor: Mr. Gelana Mamo (MPH, Assistant Professor)

December, 2025
Haramaya University, Harar, Ethiopia

APPROVAL SHEET

HARAMAYA UNIVERSITY
POSTGRADUATES PROGRAM DIRECTORATE

I hereby certify that I have read and evaluate this Thesis entitled (Minimum Meal Frequency and Associated Factors among Children Aged 6-23 Months Attending Health Centers in Harar city, Harari Region, Eastern Ethiopia) prepared under my guidance by Bereketabe Nega. I recommended that it be submitted as fulfilling the thesis requirement.

Abdu Oumer (PhD) Signature_____Date_____
Major Advisor

Gelana Mamo (MPH, Assistant Professor) Signature_____Date_____
Co-Advisor

As a member of Board of Examiners of the MPH Thesis Open Defense Examination, I certify that I have read and evaluated the Thesis prepared by Bereketabe Nega and examined the candidate. I recommend that the thesis be accepted as fulfilling the Thesis requirement for the degree of Master of Public Health Nutrition

_____ _____ _____

Chairperson _____Signature_____Date_____
Internal Examiner_____ Signature_____Date_____
External Examiner_____Signature_____Date_____

Final approval and acceptance of the Thesis is contingent up on the submission of its final copy to the Council of Graduate Studies (CGS) through the candidate‘s department or school graduate committee (DGC or SGC).

STATEMENT OF THE AUTHOR

By my signature below, I declare and confirm that this thesis is my own work. I have followed all ethical and technical principles of scholarship in the preparation, data collection, data analysis and compilation of this thesis. Any scholarly matter that is included in the thesis has been given credit through citation.

This thesis is submitted in partial fulfillment of the requirements for a master degree at Haramaya University. The thesis is placed in Haramaya University Library and is made accessible to borrowers under the rules of the library. I solely declare this thesis has not been submitted to any institution anywhere for the grant of an academic degree, diploma of certificate.

Brief quotations from this thesis may be made without any permission only if that accurate and complete acknowledgment of the source is made. Requests for permission for extended quotations from or reproduction of this thesis in whole or in part may be granted by a Head of School or Department when in his or her judgment the planned use of the material is in the interest of scholarship. In all other instances; however, permission must be obtained from the author of the Thesis.

Name: Bereketabe Nega Signature_____ Date_____

School: Public Health

BIOGRAPHICAL SKETCH

The author was born in Addis Ababa, Ethiopia. He completed his primary and secondary education in Addis Ababa and pursued his preparatory studies at Addis Ketema Secondary and Preparatory School. He later joined Ambo University, where he earned a Bachelor of Science degree in Applied Biology, followed by a Master of Science degree in Medical Microbiology from Addis Ababa University. He is currently serving as a Lecturer at Haramaya University, School of Biological Sciences and Biotechnology.

ACKNOWLEDGEMENTS

I am deeply grateful to Almighty God, the source of all wisdom and strength, for sustaining me through every challenge and blessing throughout this endeavor. I sincerely thank the data collectors and supervisors for their dedication and support. My heartfelt appreciation also goes to my family for their unwavering encouragement and constant support.

I wish to express my heartfelt appreciation to Haramaya University, the College of Health and Medical Sciences, and the Department of Public Health for their support in facilitating the teaching and learning process of research methodology. Their guidance and encouragement provided me with the invaluable opportunity to develop this thesis, and I am sincerely thankful for their contribution to my academic growth.

I am especially indebted to my advisors, Dr. Abdu Oumer (PhD) and Mr. Galana Mamo (MPH, Assistant Professor), for their insightful guidance, constructive feedback, and continuous support throughout this research process.

ACRONYMS AND ABBREVIATION

ANC	Antenatal Care
AOR	Adjusted Odds Ratio
CI	Confidence Interval
COR	Crude Odds Ratio
DDs	Dietary Diversity Score
EDHS	Ethiopian Demographic and Health Survey
EPHI	Ethiopian Public Health Institute
FAO	Food and Agriculture Organization
HBM	Health Belief Model
HFIAS	Household Food Insecurity Access Scale
IHRERC	Institutional Health Research Ethics Review Committee
IYCFP	Infant and Young Child Feeding Practices
MMF	Minimum Meal Frequency
PCA	Principal Component Analysis
PNC	Postnatal Care
SD	Standard Deviation
SDG	Sustainable Development Goals
SGS	School of Graduate Studies
SPSS	Statistical Package for the Social Sciences
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Background: - Adequate nutrition during the first two years of life is vital for brain and physical development, preventing malnutrition, and ensuring long-term health. Proper nutrition enhances cognitive function, reduces chronic disease risk, and fosters healthy eating habits. Key feeding practices include breastfeeding, timely introduction of complementary foods, and regular meal frequency. Currently, there is limited data on Minimum Meal Frequency (MMF) and its associated factors among children attending health facilities in the Harari region of Eastern Ethiopia.

Objective: - To assess the magnitude of minimum meal frequency and associated factors among children aged 6 to 23 months attending health centers in Harar City, Eastern Ethiopia.

Methods: - A facility-based cross-sectional study was conducted in five health centers in Harar City, with 516 mothers/caregivers of children aged 6 to 23 months selected through a systematic random sampling technique. MMF was assessed using a minimum frequency depending on child age; two for 6-8 months and three for 9-23months. Data were collected using a structured questionnaire via Kobo Toolbox. Both bivariable and multivariable logistic regression analyses were performed to identify factors associated with feeding frequency. Results were reported using adjusted odds ratios with a 95% confidence interval.

Result: - A total of 514 mothers/caregivers participated (99.6% response rate). Overall, 61.5% (95% CI: 57%–65%) of children met the Minimum Meal Frequency (MMF). In multivariable analysis, younger age (6–8 months) was associated with higher odds of MMF (AOR = 1.85; 95% CI: 1.10–3.12), and breastfeeding substantially increased the likelihood of meeting MMF (AOR = 3.20; 95% CI: 1.80–5.68). Maternal primary education (AOR = 2.40; 95% CI: 1.05–5.45) and high maternal knowledge (AOR = 3.40; 95% CI: 1.40–8.10) were also significant predictors. Household socioeconomic status showed a graded association: middle-class (AOR = 3.80; 95% CI: 1.40–10.1), rich (AOR = 2.50; 95% CI: 1.02–6.10), and very rich households (AOR = 3.20; 95% CI: 1.20–8.50) had higher odds of meeting MMF. Children from food-secure households were more likely to achieve MMF (AOR = 3.10; 95% CI: 1.40–6.70), and postnatal care attendance further increased MMF likelihood (AOR = 3.10; 95% CI: 1.70–5.50). Among Health Belief Model constructs, high perceived susceptibility (AOR = 1.45; 95% CI: 1.05–2.20) and high self-efficacy (AOR = 2.05; 95% CI: 1.30–3.25) were also significantly associated with MMF. The final model demonstrated good fit (Hosmer–Lemeshow p = 0.177) with no evidence of multicollinearity.

Conclusion: This study highlights that more than one-thirds of children did not fulfill MMF and it is associated with socioeconomic, maternal such as education status and maternal knowledge on MMF, and psychosocial factor significantly influence adherence to MMF among children in Harar, Ethiopia. Addressing economic and educational gaps through targeted interventions is crucial for improving child feeding practices. Multisectoral approaches are needed to enhance nutrition outcomes and healthcare equity.

Key words: Minimum Meal Frequency, children aged 6-23 months, Harar, Eastern Ethiopia

1 INTRODUCTION

1.1 Background

Infant and young child feeding (IYCF) practices directly affect the health, development and nutritional status of children less than two years of age and, ultimately, impact child survival. Improving IYCF practices in children 6–23 months of age is therefore critical to improved nutrition, health and development(WHO, 2021). Appropriate complementary foods and feeding practices including Minimum Meal Frequency (MMF) contribute to child survival, growth and development; they can also prevent micronutrient deficiencies, morbidity and obesity later in life(UNICEF, 2020)

Minimum meal frequency refers to children 6–23 months of age who consumed solid, semi-solid or soft foods at least the minimum number of times during the previous day (WHO, 2021). Minimum meal frequency is a proxy for meeting energy requirements(UNICEF, 2023). Breastfed children age 6-8 months is considered to be fed with a minimum meal frequency if they receive solid, semisolid, or soft foods at least twice a day, Breastfed children age 9-23 months is considered to be fed with a minimum meal frequency if they receive solid, semisolid, or soft foods at least three times a day, and No breastfed children age 6-23 months are considered to be fed with a minimum meal frequency if they receive solid, semisolid, or soft foods or milk feeds at least four times a day and if at least one of the feeds is a solid, semisolid, or soft food (WHO, 2023). In Ethiopia, achieving the recommended MMF is essential for reducing malnutrition and promoting optimal growth among infants and young children(WHO, 2021).

Without meeting the recommended minimum meal frequency, infants and young children are at increased risk of malnutrition, stunting, micronutrient deficiencies, morbidity, and mortality (WHO, 2021). Research indicates that inadequate meal frequency is associated with poor nutritional outcomes, including stunting, wasting, and underweight (Masuke et al., 2021). In Ethiopia, studies have shown that only a fraction of children meet the MMF criteria, with figures ranging from 47.1% to 69% across different regions(Epheson *et al.*, 2018; Wagris *et al.*, 2019).

Despite national efforts to improve infant and young child feeding, minimum meal frequency among children aged 6–23 months in Ethiopia remains suboptimal, and the factors influencing this practice are not fully understood. Existing studies show inconsistent findings across regions, and critical behavioral, socioeconomic, and health service–related determinants remain under-explored. Therefore, this study is essential to identify the key determinants of minimum meal frequency in the study area, generate context-specific evidence, and inform targeted interventions aimed at improving complementary feeding practices and child nutritional outcomes.

1.2 Statement of the Problem

Minimum Meal Frequency (MMF) is one of the core indicators of appropriate complementary feeding and is essential for ensuring adequate energy intake among children aged 6–23 months(WHO, 2021). However, globally, nearly half of children in this age group do not receive the recommended minimum number of meals per day (UNICEF, 2023). Inadequate MMF contributes to poor feeding practices and increases the risk of growth faltering, micronutrient deficiencies, and infection among young children(UNICEF, 2020) (UNICEF, 2020).

In Ethiopia, complementary feeding practices remain suboptimal, and Minimum Meal Frequency (MMF) coverage varies widely across regions. Studies report that only 33% to 72.2% of children aged 6–23 months meet the recommended MMF, indicating that a substantial proportion are not receiving the minimum number of meals required for healthy growth(Belew et al., 2017; Gizaw & Tesfaye, 2019). This persistent gap in MMF places many Ethiopian children at increased risk of inadequate energy intake during a critical developmental period.

Several factors have been associated with MMF in Ethiopia, including maternal education, postnatal care visits, child age, breastfeeding status, household hunger, family size, media exposure, and wealth status(Belew et al., 2017; Beyene et al., 2015; Mekonnen et al., 2017; Wagris et al., 2019a; Wake, 2021). Food insecurity has also been identified as a key barrier to meeting meal frequency recommendations.

Despite evidence from various parts of the country, there is limited information specific to the Harari Region, particularly among children attending health facilities. Harari has unique cultural, socioeconomic, and dietary characteristics that may influence feeding practices differently from other regions. The absence of region-specific evidence makes it difficult for decision-makers to design targeted interventions that address local determinants of MMF.

Therefore, this study aims to assess the determinants of Minimum Meal Frequency among children aged 6–23 months attending health centers in the Harari Region. Generating evidence on these determinants is essential for informing locally tailored strategies to improve complementary feeding practices and advance child nutrition outcomes.

1.3 Significance of the study

This study provides context-specific evidence on the determinants of Minimum Meal Frequency (MMF) among children aged 6–23 months in the Harari Region, where limited data exists. The findings will help the Harari Regional Health Bureau design targeted nutrition programs to improve complementary feeding practices.

Health professionals and health care providers can use the results to strengthen counseling during ANC, PNC, growth monitoring, and routine child health services. Governmental and non-governmental organizations can apply the evidence to guide program design, resource allocation, and community interventions aimed at enhancing infant and young child feeding.

The study will also benefit academic institutions and researchers by providing locally relevant data to support teaching, curriculum development, and future research. Overall, the findings contribute to improving child nutrition and health outcomes through evidence-informed strategies tailored to the Harari context.

1.4 Objectives

1.4.1 General objective

- To determine the magnitude of MMF and associated factors among children aged 6 to 23 months attending health centers in Harar city, Eastern Ethiopia from December 23- January 23, 2024.

1.4.2 Specific objectives

- To determine the magnitude of MMF practice among children aged 6 to 23 months attending health centers in Harar city.

- To identify the factors associated with MMF among children aged 6 to 23 months attending health centers in Harar city.

.

2 LITERATURE REVIEW

2.1 Magnitude of Minimum Meal Frequency among children

The prevalence of Minimum Meal Frequency (MMF) varies widely across countries and regions. Studies from South Asia report substantial variation, with low levels in Pakistan (38%) and India, but higher levels in Bangladesh (63%) and Indonesia (74%)(Ahmad et al., 2017; Ali et al., 2021; Na et al., 2017) 018). A multi-country analysis from South Asia similarly found that Bangladesh, Nepal, and Sri Lanka achieve MMF rates above 80%, while India and Pakistan lag behind(Senarath et al., 2012). In East and Central Asia, MMF prevalence ranges from 42% in Iran to 78% in China(Feng et al., 2022; Kamran et al., 2017) (Kamran et al., 2017; Feng et al., 2022). Regional assessments show that East Asia and the Pacific and Latin America maintain relatively high coverage, with about three in four children meeting MMF(White et al., 2017).

MMF coverage in African countries, particularly sub-Saharan Africa, remains suboptimal. Regional analyses indicate that sub-Saharan countries have some of the lowest MMF prevalence globally, with only 41% of children aged 6–23 months meeting the recommended frequency(Aboagye et al., 2024; Baye & Kennedy, 2018). Within the region, Liberia reported the lowest prevalence at 25.4%, while Lesotho had the highest at 59.3%(Aboagye et al., 2024) (Aboagye et al., 2024). Overall, these findings reflect persistent challenges in meeting Infant and Young Child Feeding (IYCF) indicators in the region.

In west African countries, A cross sectional study done in 2017 in Benin showed that the magnitude of children getting a minimum meal frequency was 71% (Mitchodigni et al., 2017). Community based cross sectional study conducted in Ghana also showed 57.3% children aged 6 to 23 months met MMF (Saaka et al., 2016). A population based survey also conducted in Burkina Faso revealed that 60% of children received the minimum meal frequency (Sarrassat et al., 2019) likewise high prevalence of MMF observed in Gambia 80% (Issaka et al., 2017).

Country-level studies show varying MMF prevalence in West and East Africa. In West Africa, 71% of children in Benin, 57.3% in Ghana, 60% in Burkina Faso, and 80% in Gambia met MMF(Issaka et al., 2015; Mitchodigni et al., 2017; Saaka et al., 2016; Sarrassat et al., 2019). In contrast, East African countries report lower adherence: less than 40% of children in Uganda

and Tanzania achieved MMF(Gewa & Leslie, 2015), and a retrospective cohort study in Northern Tanzania reported 40.3% MMF, with low MMF linked to higher risks of stunting, wasting, and underweight(Masuke et al., 2021). These findings highlight substantial intra-regional disparities and underscore the need for targeted nutrition interventions.

In Ethiopia, a systematic review and meta-analysis conducted in 2021 found that, The pooled prevalence of MMF practice among children aged 6 to 23 months was estimated to be 63.80% (Wake, 2021). According to a report by central statistical agency of Ethiopia, The proportion of children fed with a minimum meal frequency ranges from a high of 82% in Addis Ababa to a low of 34% in Somali (EPHI, 2019). Secondary analysis of the 2019 mini Ethiopian Demographic and Health Survey indicated that 47.0% of children had inadequate meal frequency (Tesfie et al., 2024).

Community and institutional studies also show variation across Ethiopia. In Northeast Ethiopia, 68–69% of children met MMF(Brhane et al., 2020; Wagris et al., 2019), while in Dabat district, 72.2% achieved MMF(Belew et al., 2017). Oromia region reported only 33% (Gizaw & Tesfaye, 2019), compared to 68.4% in Bale(Tegegne et al., 2017). Other regions include Afar (43.8%; Wuneh et al., 2019), Southern Ethiopia (67–69%; Mekonnen et al., 2017; Kassa et al., 2016), Northwest Ethiopia (83.7%; Bikes et al., 2020), and rural Babile (50.5%; Teji Roba, 2016). These findings highlight considerable regional differences in MMF practices, reflecting varying access to nutrition services, cultural feeding practices, and socioeconomic conditions.

2.2 Factors associated with minimum meal frequency

2.2.1 Socio demographic and maternal related factors

Maternal Education is significantly associated with MMF. Illiterate mothers were less likely to feed their children to fulfil the minimum requirement of meal frequency. The probability of meeting the requirement of minimum meal frequency was reduced by 50% if the child fed by illiterate mothers/caregivers as compared to mothers or caregivers who attain grade 10 and above [AOR = 0.5; 95% CI (0.2–0.9)].(Mekonnen et al., 2017). A study in Pakistan also revealed that In urban areas, mothers who read newspapers or magazines have 70% higher odds of meal frequency compliance [1.70 (1.07–2.70)] (Ali et al., 2021). Inadequacy in achieving MMF also observed among children whose mothers had no schooling(Issaka et al., 2017).

Analysis of Ghana demographic health survey shows a positive association between educational attainment of mothers and the minimum daily meal frequency of their children. Mothers with higher education ($\beta = 0.496$, $p < 0.10$) reported increased daily meal frequency for their children (Dadzie et al., 2021). Another study which analyses demographic and health data for 5 countries across South Asia also provides the strongest evidence for this association and reveals that poor maternal education significant factors associated with meal frequency (Senarath et al., 2012).

Children whose mothers were in paid work showed a significantly higher prevalence of meeting the minimum meal frequency than those whose mothers were not working (P = 0.002)(Victor et al., 2014). A community based cross sectional study in Southern Ethiopia also showed that children came from households lead by government workers, who met the requirement of minimum meal frequency, were reduced by 40% [AOR = 0.6; 95% CI (0.4–0.9)](Mekonnen et al., 2017). The Gambian Demographic Health Survey (GDHS) multilevel mixed effect analysis reported that mothers who are currently worker had shown more positive tendency to provide MMF for their children by the odds of (AOR = 1.27, CI 1.04, 1.56) compared to with mothers who did not have active work status(Terefe et al., 2023)

Media exposure and living in urban area also associated with MMF. mothers who listen to the radio had lower odds of achieving minimum meal frequency (Ali et al., 2021). Children born from mothers who were exposed to media, i.e., watched television, listened to radio and read newspapers or magazines every day or at least once a week has more likely to meet minimum meal frequency [AOR 2.62; 95 % CI (1.90–3.61)] (Beyene et al., 2015) and mothers who lived in the urban area were about 3 times more likely to provide the recommended minimum meal frequency compared to mothers who lived in the rural area (AOR = 3.02; 95% CI: 1.41, 6.48) (Belew et al., 2017). children whose mothers are living in urban areas most likely get MMF (OR = 1.28; 95% CI = 1.06–1.54) (Yunitasari et al., 2022). Children from urban areas showed a higher prevalence of meeting minimum dietary diversity and acceptable diet indicators(Victor et al., 2014).

2.2.2 House hold Wealth

Children belonging to rich wealth status families were1.69 time (AOR = 1.69, 95% CI = 1.09, 2.61) more likely to receive the recommended minimum meal frequency, compared to poor wealth status families(Brhane et al., 2020). The data analysis for 2016 Ugandan demographic

health survey reported that highest quintile of wealth was significantly associated with greater odds of a child reaching the MMF(Scarpa et al., 2022). A cross sectional study conducted in 2017 shows children from households with the upper wealth index (OR = 1.40; 95% CI = 1.03–1.91) meet high MMF (Yunitasari et al., 2022). Based on the pooled effects of 2 cross-sectional studies,25,32 rich family were 2.11 times more likely to provide the recommended MMF for children aged 6 to 23 months than poor family (AOR = 2.11, 95% CI [1.42, 2.81], I2 = 0.0%, P = .493)(Wake, 2021). Also a study in Dabat reported that Children belonging to middle and rich wealth status families were 1.8 and 2.3 times (AOR = 1.84; 95% CI: 1.27, 2.68) and (AOR = 2.40; 95% CI: 1.568, 3.69) more likely to receive the recommended minimum meal frequency, respectively, compared to poor wealth status families(Belew et al., 2017).

2.2.3 Child characteristics

Child age is significantly associated to MMF. A study in 2017 in Ethiopia shows that odds of minimum meal frequency were 71% times less likely among children aged 6–8 months than those aged 12–23 months (AOR = 0.29, 95% CI: 0.28–0.94)(Tegegne et al., 2017) a study in Gambia also revealed that Children whose age found from 12–17 to 18–23 months old have a higher odd and 1.44 times to receive the MMF as compared to with 6–11 months old children respectively (Terefe et al., 2023). A systematic review and met analysis done in Ethiopia also found that children aged 18 to 23 months were 5.75 more likely to receive the recommended MMF than children aged 6 to 11 months (Wake, 2021).

A study in Afar revealed that Male children were about 2.6 times more likely to receive the minimum meal frequency than among female children(Wuneh et al., 2019) another study in Pakistan also observed that male child most like tends to achieve MMF compared to females(Ali et al., 2021). Similar finding also reported in India that Male child had significantly higher odds of having adequate MMF (AOR = 1.8; 95% CI = 1.10, 2.93) as compared to female child.(Ahmad et al., 2017) contrarily, a study in a community based cross sectional study in Wolaita southern Ethiopia shows Girls were nearly two times more likely to be fed frequently as compared to boys [AOR = 1.5; 95% CI (1.02–2.1)(Mekonnen et al., 2017).

2.2.3.1 Breast feeding status

Breastfeeding status also associated with meeting recommended MMF. Initiation of breastfeeding were 2 times more likely to meet minimum meal frequency comparing with their counterparts, AOR= 2.2, 95% CI (1.17, 4.18). Currently, breastfeeding children were 7.5 times

more likely to achieve minimum meal frequency comparing with their counterparts, AOR=7.5, 95% CI (3.95, 14.4) (Wagris et al., 2019a). According to Secondary data analysis of the 2010 Tanzania Demographic Health Survey, Compared with breastfed children, the non-breastfed children had lower rates of minimum meal frequency (34.2% vs. 11.4%)(Victor et al., 2014).

2.2.4 Health service utilization

A study in Tanzania shows that children whose mothers did not have any postnatal check-ups had higher risk for not meeting minimum dietary diversity meal frequency and acceptable diet than those whose mothers had postnatal check-ups within 41 days after delivery(Victor et al., 2014) a study in India reveled that having a delayed postnatal checkup on the infant (beyond the second day after delivery) was associated with 59% increased odds to meet the MMF criterion, compared to children who had their postnatal check-up within 1 day of delivery(Na et al., 2017). Similar study in northwest Ethiopia also shows Mothers who had attended PNC within 1–2 day after delivery [AOR 2.30; 95 % CI (1.27–4.15)] were more likely to provide recommended meal frequency than mothers who had no PNC visit (Beyene et al., 2015). Another study also found that mothers who had PNC visit were 1.90 times more likely to provide the recommended MMF for children aged 6 to 23 months (AOR = 1.90, 95%CI [1.31, 2.49], I2 = 0.0%, P = .596) than mothers who had no PNC visits(Wake, 2021). Likewise, a study in Afar region of Ethiopia also reported that children born from mothers who had postnatal care visits were about 2.2 times more likely to get the recommended meal frequency as compared to mothers who had no postnatal care visits(Wuneh et al., 2019).

2.3 Health Belief Model (HBM) constructs

The Health Belief Model (HBM) provides a psychological framework to explain health behaviors by examining how individuals perceive health risks, disease severity, benefits, barriers, and their own self-efficacy in adopting preventive measures(Hayden, 2019; Janz & Becker, 1984). In the context of infant and young child feeding (IYCF) practices, the HBM offers insights into why some caregivers follow recommended feeding practices while others do not (Mulualem et al., 2016). The Health Belief Model (HBM) effectively explains caregivers' adherence to recommended infant and young child feeding (IYCF) practices, particularly minimum meal frequency (MMF). Studies demonstrate that HBM-based interventions improve complementary feeding practices by addressing perceived susceptibility (e.g., risks of undernutrition), perceived benefits (e.g., dietary diversity), and self-efficacy

(caregivers' confidence in preparing meals). For instance, HBM-tailored education significantly increased dietary diversity (e.g., legume consumption) (Mulualem et al., 2016), while perceived barriers (e.g., time constraints) and low self-efficacy were key predictors of suboptimal MMF in Iran (Kram et al., 2016; Mirzaei et al., 2020). However, significant gaps remain in understanding the role of contextual factors like household food insecurity and cultural norms, which may override individual health beliefs in shaping feeding practices. Additionally, most interventions prioritize short-term knowledge gains over long term behavioral outcomes, leaving the sustainability of HBM-based strategies in resource-limited settings underexplored.

Although several studies have assessed minimum meal frequency globally and in Ethiopia, findings remain inconsistent across regions and little is known about the influence of maternal perceptions and contextual factors. Most available evidence is broad and does not capture local disparities. Therefore, this study aims to determine the prevalence of MMF and identify its associated factors among children aged 6–23 months attending health centers in Harar.

2.4 Conceptual framework

This conceptual framework presents modifying factors, individual beliefs and actions for Minimum Meal Frequency (MMF) among children aged 6-23 months (figure 1.)

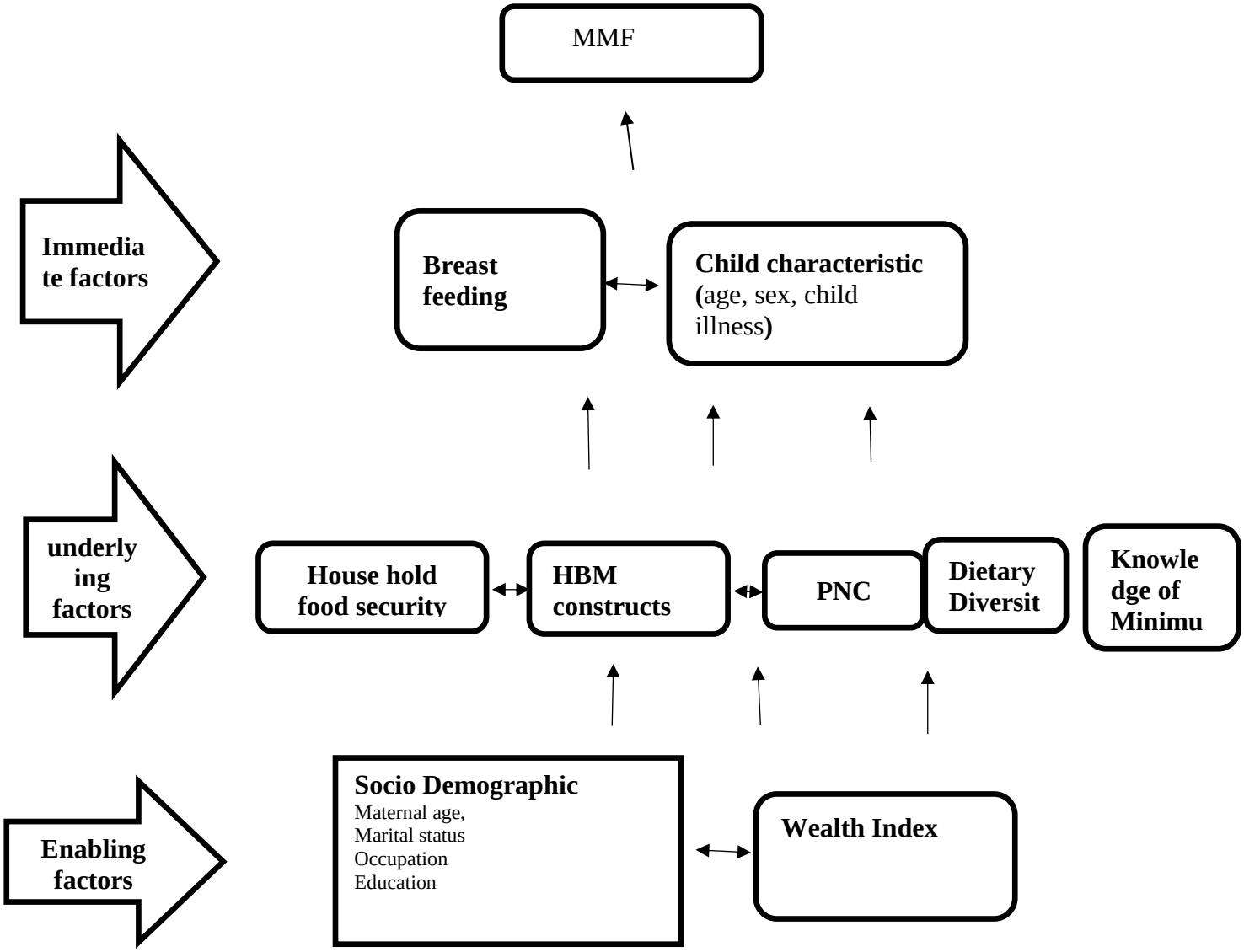

Figure 1: Health belief model construct and conceptual frame work for factors associated with Minimum Meal Frequency among children 6-23 months. Source: Extrapolated from literature review and adapted from UNICEF conceptual framework(UNICEF, 2021).

3 METHODS AND MATERIAL

3.1 Study area and period

The study was conducted from December 2023 to January 2024 in health centers, Harar city of Harari region. The Region is located in the eastern part of Ethiopia approximately 525 kilometers from Addis Ababa, the capital city of Ethiopia. The total population is 153,000. Among this population, 7.166% are children under 3 years old, and 12.9% fall within the age range of 6 months to 59 months. Harar is home to five health centers, each catering to specific segments of the population: Hakim Health Center serves 30,142 individuals; Amir Nur Health Center attends to 31,189 residents; Jinela Health Center provides healthcare for 28,539 people; Aboker Health Center serves a population of 22,640; and Shenkor Health Center offers services to 23,793 residents (HHB, 2024). These health centers play a vital role in addressing the diverse healthcare needs of the local community, significantly contributing to the Harari region overall well-being and vitality.

3.2 Study design

An Institutional based cross-sectional study was conducted. Health centers in Harar serve both healthy and sick children for routine services such as immunization, growth monitoring, and counselling. Thus, they provide an appropriate and accessible setting for assessing MMF practices.

3.3 Population

3.3.1 Source population

All children aged 6–23 months and their mothers/caregivers residing in Harar city.

3.3.2 Study population

All children aged 6–23 months and their mothers/caregivers who visit the selected health centers in Harar city during the data collection period.

3.4 Inclusion and exclusion criteria

3.4.1 Inclusion Criteria

All Children aged 6 to 23 months of age and mothers/ caretakers pair attending health centers in Harar city.

3.4.2 Exclusion Criteria

- Children with severe illnesses or conditions that affect their feeding practices.

3.5 Sample size determination

3.5.1 Sample size calculation for the first specific objective

The sample size was determined by using the formula of single population proportion by considering the prevalence of MMF 72.2% from Dietary diversity and meal frequency among infant and young children (Belew et al., 2017). By using degree of confidence level of 95% and 5% precision that is the margin of error gives 309. Considering a design effect of 1.5 and 10% non-response, the required sample size for the study on Minimum Meal Frequency (MMF) among children aged 6 to 23 months at Hiwot Fana Hospital, Ethiopia is approximately 516 participants.

Z-value for 95% confidence level = 1.96

Estimated prevalence (p) = 0.722 (72.2%)

Standard error = 0.05 (5%)

$$n = \frac{Z^2_{(1-\alpha/2)}\, p\,(1-p)}{d^2}$$

N=309 * 1.5= 464, considering 10% non-response error = 464/0.90 = 516 participants.

3.5.2 Sample size calculation for second specific objective

The sample size for the second objective was determined by using double proportion formula according to factor significantly associated with the outcome variables (MMF) During calculation, assumptions such as two-sided confidence level of 95%, margin of error of 5 % and power of 80%, 1:1 proportion of cross-sectional ratio and a respective odds ratio for each factor were considered using Epi Info 7.2.6.0 software program (Table 1).

Table 1: Sample size determination of independent variables (second objectives) of factors associated MMF among children aged 6 to 23 months attending health centers in Harar city. Eastern Ethiopia, 2024

Factors	MMF		AOR	Sample size with 10% of non-response rate and Design effect of 1.5	Reference s
	Exposed	Unexposed			
Wealth index	77%	59.6%	1.69	410	(Brhane et al., 2020)
Early initiation of breast feeding	81.5%	45.6%	2.2	110	(Wagris et al., 2019)

The largest sample size of 516, calculated using the single proportion formula for the first objective, was considered to address both objectives simultaneously. Hence, larger sample size typically yields a greater response.

3.6 Sampling procedure and sampling technique

From the Five health centers available in Harari City: Aboker, Amirnur, Hakim, Jinela, and Shenikor, three health centers, Aboker, Hakim and Jinela were selected using simple random sampling procedure. Then using systematic random sampling method study participants are selected and proportionally allocated to each selected health centers.

Based on the data available from the health centers, from June 2024 to August 2024, the number of outpatient visits for children under 2 years old was 415 at Aboker Health Center, 815 at Hakim Health Center, and 830 at Jinela Health Center. Then, the total sample size was allocated proportionally to the three selected health centers, resulting in sample sizes of 104, 204, and 208 for Aboker, Hakim, and Jinela Health Centers, respectively. Samples will be selected from each Health center by using a systematic random sampling method using a k-value of 4.02 for Aboker, 3.98 for Hakim and 3.80 for Jinela Health Center. The rounded k-value of 4 were used to select every fourth individual from each health center (figure 2).

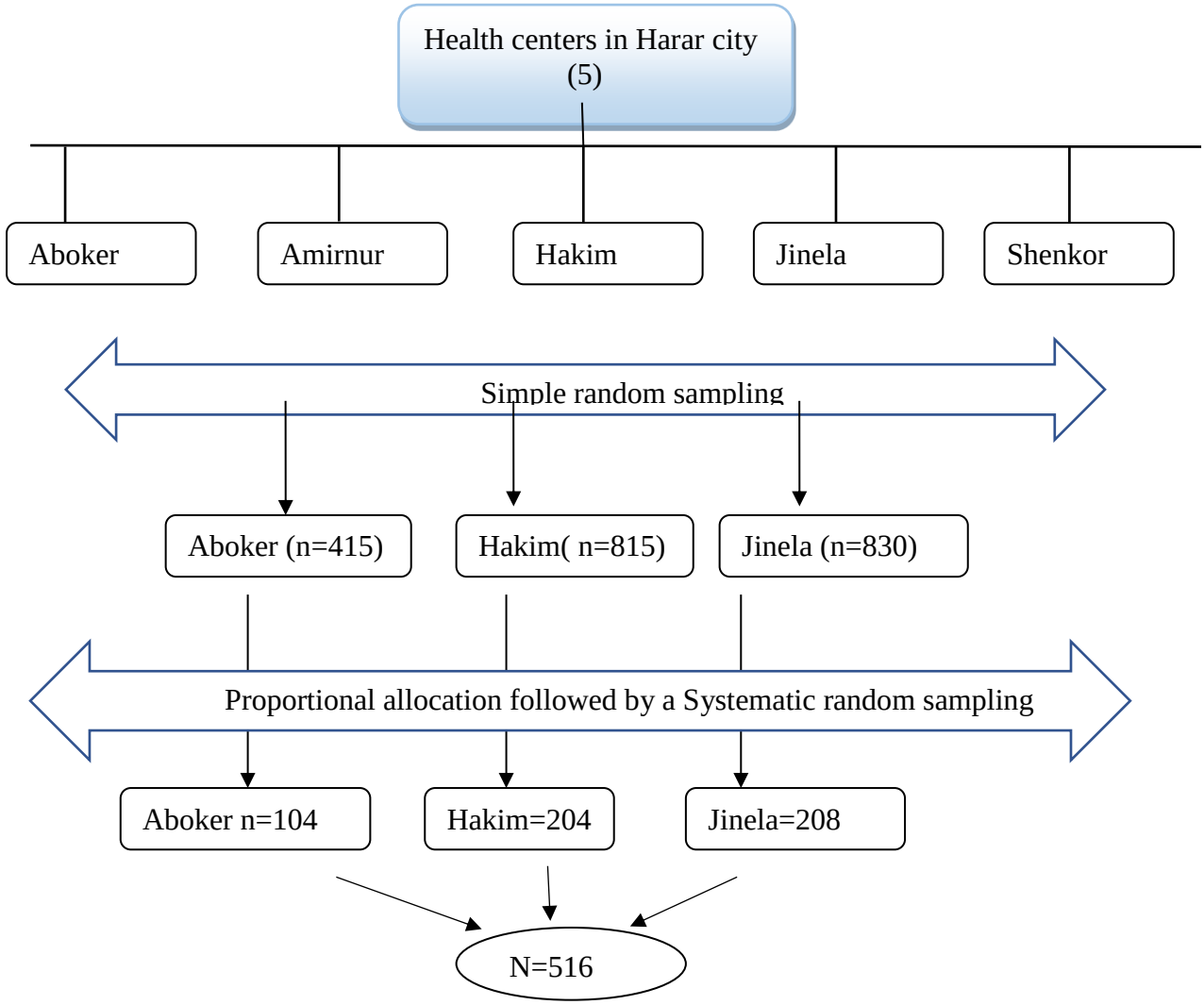

Figure 2:A schematic diagram showing the sampling procedure for the study on minimum meal frequency and associated factors among children aged 6-23 month attending health centers in Harar, Eastern Ethiopia, 2024.

3.7 Data collection method

3.7.1 Data collection tool

In this study, data were collected through face-to-face interviews with mothers or caregivers of children aged 6-23 months using the Kobo Toolbox. The structured questionnaire comprised nine sections: Sociodemographic, child characteristics, health service utilization, assessment of Minimum Meal Frequency, dietary diversity, house hold food security, environmental condition, Wealth status and Health belief model .The HFIAS tool (Coates et al., 2007) were employed to measure food insecurity. Questionnaires are adapted from indicators for assessing infant and young children's feeding practice guideline (WHO, 2021). Meal frequency practices of each child were determined by asking the mother how many times the child had solid, semi-solid or soft foods in the twenty-four hours before the interview date.

The ninth part of the questionnaire includes 19 items based on HBM. Perceived susceptibility, perceived severity and perceived benefits consisted of 9 items. Also, seven items are related to perceived barriers and items to perceived self-efficacy. The cues to action were also measured using three items. Answers to this part of the questionnaire were scored using a 5-point Likert scale (from 5 = "strongly agree" to 1 = "strongly disagree")(Hayden, 2019; Janz & Becker, 1984).

3.7.2 Data collectors

Five diploma holders in nursing as data collectors and two- degree holders as supervisors were involved in the data collection.

3.7.3 Data collection procedure

Data were collected through interviewer-administered structured questionnaires using Kobo Toolbox. Mothers/caregivers who met the inclusion criteria were approached at the selected health centers, informed about the study, and those who agreed provided verbal consent. Interviews were conducted in a private area within the facility to ensure confidentiality. The data collectors administered the questionnaire in the participant's preferred language (Amharic or Afan Oromo). Completed forms were submitted daily through Kobo to allow regular monitoring.

3.8 Variable

3.8.1 Dependent variable

Minimum Meal Frequency (MMF)

3.8.2 Independent variables

Socio demographic factor (age, marital status, occupation, education)

Child factor (breastfeeding, illness, age, sex)

PNC

House hold food security

Dietary Diversity

Knowledge of MMF

Wealth index

Health belief construct

Perceived susceptibility

Perceived severity

Perceived benefits

Perceived barriers

Cues to action

3.9 Operational Definition

Minimum meal frequency:-The proportion of children aged 6–23 months who received the minimum age-specific number of solid, semi-solid, or soft food feedings (and milk feeds for non-breastfed children) during the preceding 24 hours, according to (WHO, 2021) criteria:

Breastfed children

6–8 months: ≥2 feedings

9–23 months: ≥3 feedings

Non-breastfed children (6–23 months)

≥4 feeds (including milk feeds), of which at least one must be solid, semi-solid, or soft food. Children who met the above age-specific thresholds were classified as achieving MMF.

Dietary Diversity: The proportion of children 6–23 months of age who consumed foods and beverages from at least five out of eight defined food groups during the previous day(FAO, 2016; WHO, 2021).

Household food security**:** Household food security was assessed using the Household Food Insecurity Access Scale (HFIAS), with scores ranging from 0 to 27. Based on the Food and Agriculture Organization (FAO) behavioral frequency guidelines, households were categorized as food secure (scores 0–1; no anxiety or dietary changes), mildly food insecure (scores 2–7; occasional worry about food access), moderately food insecure (scores 8–14; reduced diet quality and frequency), and severely food insecure (scores 15–27; frequent meal skipping or entire days without food). (Coates et al., 2007)

Wealth Index: The Wealth Index is a composite measure of household economic status, constructed using data on household assets. Data was collected through a structured questionnaire, and assets were weighted using principal component analysis (PCA). Households were categorized into five wealth quintiles: Very Poor (lowest 20%), Poor (20-40%), Middle Class (40-60%), Rich (60-80%), and Very Rich (highest 20%)(Rutstein,Shea O., 2004).

Knowledge of Minimum Meal Frequency: refers to the understanding of a mother /caregiver regarding the minimum number of meals that should be provided to a child aged 6–23 months within 24 hours, excluding breast milk. It is assessed using a structured questionnaire with questions about the recommended number of meals for children aged 6-23 months, as per WHO guidelines. Responses are scored based on correctness, with each correct answer assigned a point. Total scores are converted into percentages, and the mean score is calculated to determine the overall level of knowledge(WHO, 2021).

Perceived susceptibility**:** refers to mothers/caregivers belief about the likelihood of their child experiencing nutritional deficiencies or health issues due to not meeting the recommended minimum meal frequency, measured by asking them how likely they think it is that their child may not get enough nutrition if they do not meet the recommended meal frequency (using a Likert scale). The responses are analyzed and reported as mean scores catagorized into high susceptibility (≥ 75%), moderate susceptibility (50% - 74%), and low susceptibility (< 50%)(Rosenstock, 1974).

Perceived severity**:** refers to mothers/caregivers belief about the seriousness of the consequences that may arise from not meeting the recommended minimum meal frequency for their child's health and development, measured by asking them the potential consequences of not meeting this frequency on child's health using Likert scale. The responses are analyzed and reported as mean scores classified into high severity (≥ 75%), moderate severity (50% - 74%), and low severity (< 50%)(Rosenstock, 1974).

Perceived benefits**:** refer to mothers/caregivers belief in the advantages of meeting the recommended minimum meal frequency for their child's health and well-being, measured by asking them the extent to which they believe their child would benefit from meeting minimum meal frequency using Likert scale. The responses are analyzed and reported as mean scores catagorized into high benefits (≥ 75%), moderate benefits (50% - 74%), and low benefits (< 50%)(Rosenstock, 1974).

Perceived barriers: refer to mothers/caregivers belief about the obstacles or challenges that may prevent them from providing the recommended minimum meal frequency for their child. It is measured by asking them to rate the extent to which they perceive various barriers (e.g., time, cost, knowledge) on a Likert scale. The responses are analyzed and reported as mean scores catagorized into high barriers (≥ 75%), moderate barriers (50% - 74%), and low barriers (< 50%)(Rosenstock, 1974).

Cues to action: This construct refers to external factors that trigger mothers/caregivers to take action regarding their child's meal frequency. This construct will be assessed using a series of statements that caregivers can respond to on a 5-point Likert scale. The results will be reported as mean scores categorized into high cues to actions (≥ 75%), moderate cues to actions (50% - 74%), and low cues to action (< 50%)(Rosenstock, 1974).

3.10 Data quality Control

An interviewer-administered questionnaire was developed in English and subsequently translated into Amharic and Afaan Oromo for the purpose of data collection. To ensure its consistency, the questionnaire was then retranslated back into English by a language expert. Training was provided to the data collectors, focusing on interview techniques, ethical considerations, participant rights, comprehension of all questions, strategies for reducing underreporting, and maintaining confidentiality.

A pre-test conducted one week prior to the actual data collection at two health centers that are not part of the selection, which are Amirnur and Shenkor Health center using 5% of the total sample size to validate the tool. Following the pre-test, all necessary modifications were made. Throughout the data collection period, the principal investigator and supervisor conducted rigorous supervision, checking the collected data for completeness, accuracy, and consistency. The principal investigator will oversee the overall supervision. To compare two data cells and resolve any discrepancies, double data entry was performed.

3.11 Data processing and analysis

Data collected through KoboToolbox were exported to SPSS version 20 for cleaning, coding, and analysis. Data were checked for completeness and consistency before statistical analysis. Frequencies and percentages were calculated for all categorical variables, such as breastfeeding status, maternal education, household wealth index, food insecurity categories, dietary diversity classifications, and MMF adherence. Means and standard deviations were computed for continuous variables to summarize overall characteristics of the study population.

The Wealth Index was constructed using Principal Component Analysis (PCA), which incorporated household assets like housing quality and durable goods. This index was categorized into quintiles: Very Poor, Poor, Middle Class, Rich, and Very Rich. Food Insecurity was measured using the Household Food Insecurity Access Scale (HFIAS) and classified into four categories: Severely Food Insecure, Moderately Food Insecure, Mildly Food Insecure, and Food Secure. Due to the small number of households classified as severely food insecure, this category was merged with moderately food insecure households to ensure adequate cell size and maintain model stability in the logistic regression analysis. Dietary Diversity was assessed using the Dietary Diversity Score (DDS), representing the number of

food groups consumed within the previous 24 hours, and categorized as low, moderate, or high. MMF was evaluated based on WHO guidelines and grouped into two categories: Yes (meets MMF) and No (does not meet MMF).

To identify factors associated with MMF, binary logistic regression was performed. Variables with a P-value < 0.25 in univariable analysis were entered into the multivariable logistic regression model to control for potential confounders. Multicollinearity among independent variables was assessed using the standard errors (SE) of regression coefficients, with SE > 2.0 considered indicative of possible multicollinearity. The goodness of fit of the final model was evaluated using the Hosmer–Lemeshow test, with a P-value > 0.05 considered a well-fitting model. Results were expressed as odds ratios (ORs) with 95% confidence intervals (CIs), and statistical significance was set at $P \leq 0.05$.

3.12 Ethical considerations

Ethical clearance was secured from the Institutional Health Research Ethics Review Committee (IHRERC) of Haramaya University, College of Health and Medical Sciences. An official permission letter obtained from the College of Health and Medical Sciences was submitted to Harari Regional Health Bureau and selected health centers. Health center heads and participants were informed clearly about the purpose, risks and benefits. Then, an informed, voluntary, written and signed consent was obtained from the heads of health centers and each study participant. Those who signed written consent were only participate in the study and the confidentiality of their response was maintained throughout the research process by giving a code for the participant. Personal privacy and cultural norms of the participants was respected.

3.13 Plan for Information Dissemination

The result of this study will be submitted and presented to Haramaya University College of Health and Medical Sciences, School of Graduate studies. After it is accepted by the University, copies of the findings will be shared with all concerned bodies at Woreda, Zonal and Regional level. It can also be disseminated to interested organization working on child nutrition program at the localities. Furthermore, efforts will be made to present the results on scientific conferences and peer reviewed journal publications will be considered.

4 RESULTS

4.1 Sociodemographic characteristics

A total of 516 mothers were eligible for the study, and 514 participated, yielding a response rate of 99.6%. The mean age of mothers was 28 ± 6.5 years. The largest group of mothers were housewives (149, 29%), and about half, 259 (50.4%), had attended primary school (grades 1–8). In terms of ethnicity, 176 (34.2%) were Oromo, while 226 (44%) identified as Muslims. Most households (376, 73.2%) had four to six members. Regarding economic status, 106 (20.6%) of respondents were classified within the very poor wealth quintile (Table 2).

Table 2:-Socio demography of children 6–23 months attending health centers in Harar town, Eastern Ethiopia, 2024(n=514)

Variable	Category	Freq.	%
Age of mothers	18–25 years	231	44.9%
	26–32 years	143	27.8%
	33–39 years	115	22.4%
	40 years and above	25	4.9%
Marital Status	Divorced	31	6.0%
	Married	369	71.8%
	Single	77	15.0%
	Widowed	37	7.2%
Religion	Catholic	11	2.1%
	Muslim	226	44.0%
	Orthodox	152	29.6%
	Protestant	111	21.6%
	Others	14	2.7%
Ethnicity	Amhara	146	28.4%
	Oromo	176	34.2%
	Gurage	61	11.9%
	Tigre	55	10.7%
	Others (Somali, Afar, Woilata, Silte, Sidama)	76	14.8%
Education (Mother)	Unable to read/write	97	18.9%
	Primary (1–8)	259	50.4%
	Secondary and above	158	30.7%
Education (Father)	Unable to read/write	80	15.6%
	Primary (1–8)	192	37.4%
	Secondary and above	242	47.1%
Maternal Occupation	Housewife	149	29.0%
	Daily laborer	81	15.8%
	Merchant	81	15.8%
	Govt. employee	96	18.7%
	Private org. employee	88	17.1%
	Farmer	13	2.5%
	Other	6	1.2%
Paternal Occupation	Govt. employee	193	37.5%
	Private org. employee	102	19.8%
	Daily laborer	92	17.9%
	Merchant	55	10.7%
	Farmer	46	8.9%
	Other	26	5.1%
Place of Delivery	Health Facility	459	89.3%
	Home	55	10.7%
Family Size	<4	107	20.8%
	4–6	376	73.2%
	>6	31	6.0%
Wealth Index	Very Poor	106	20.6%
	Poor	98	19.1%
	Middle Class	102	19.8%
	Rich	105	20.4%
	Very Rich	103	20.0%
Number of under five children	1	285	57.2%
	2	187	37.6%
	>2	26	5.2%

4.2 Child characteristics

Among the children included in this study, half of them 281 (54.7%) were in the age between 6–8 months. The mean age (± SD) of children was 13.3 ± 4.5 months old. More than half, 280(54.5%) were males and the majority, 383(74.5%) of the children were breastfed at a time of data collection.

Regarding the presence of diarrhea and fever in the past two weeks prior to the interview, 203 (39.5%) and 228, (44.4%) of children had diarrhea and fever respectively. The majority of children (58%) were a middle born in their families. (Table 3)

Table 3:- Child related characteristics of children 6-23 month in Harar, Eastern Ethiopia,2024 (n=514)

Variable		Frequency	Percentage
age of the child	6-8 m	281	54.7
	9 - 23	233	45.3
Child‘s sex	Female	234	45.5
	Male	280	54.5
Breast feeding status	Yes	383	74.5
	No	131	25.5
Birth order	First born	106	20.6
	2-3 born	298	58.0
	>=4 born	110	21.4
Has the child had diarrhoea in the last weeks	Yes	203	39.5
	No	311	60.5
Has the child had febrile disease in the last weeks	Yes	228	44.4
	No	286	55.6
Any other illness in the last week	Yes	134	26.1
	No	380	73.9

4.3 Maternal Health service utilization related characteristics

From the participants of this study, 54.9% of mothers/caregivers visited health centers for postnatal care (PNC). However, 27% of these individuals did not receive education on child feeding practices, including Minimum Meal Frequency (MMF). Furthermore, the data indicate that 38% of the mothers possess low knowledge regarding MMF, while 34% demonstrate moderate knowledge. (Table 4)

Table 4:- Maternal health care utilization characteristics of mothers having children aged 6–23 months in Harar, Eastern Ethiopia, 2024 (n=514).

Variables		Frequency	Percent
Place of delivery	Health facility	459	89.3
	Home	55	10.7
Did mother or caregiver visit Health Centre for PNC?	Yes	282	54.9
	No	232	45.1
number of PNC visit	<two times	136	48.2
	>=2times	146	51.8
education about child feeding practice and Minimum Meal Frequency during PNC	No PNC visit	232	45.1
	No education during PNC	143	27.8
	Yes	139	27.0
Knowledge about MMF	Good knowledge	142	27.6
	moderate knowledge	175	34.0
	Poor knowledge	197	38.3

4.4 Maternal environment related characteristics

The findings on household water, sanitation, and waste disposal practices reveal significant insights. Regarding the source of drinking water, more than half of the respondents (52.7%) reported using public pipes, while 40.9% relied on water wells, and a smaller proportion (6.4%) used jar-packed or bottled water. Access to toilet facilities was available to 68.7% of households, leaving 31.3% without proper toilet access. In terms of waste disposal methods, the majority (52.7%) resorted to open-field disposal, 44.7% utilized plastic containers that were collected by waste collectors, and 2.5% relied on other methods of disposal.

4.5 Dietary Diversity and Household food security

The mean and SD of the dietary diversity score is 3.96 and 1.26 respectively. The proportion of children who met the minimum dietary diversity was 33.7% with (95%CI: 29.6% -37.8%). The median DD score was 4, with an interquartile range of 2, indicating the middle 50% of scores fell within a 2-point range. The distribution of dietary diversity terciles was 199 children (38.7%) were in the first tercile; 142 children (27.6%) were in the second tercile; and 173 children (33.7%) were in the third tercile. Among the food groups assessed, Grain roots and tuber where the most frequently consumed, with 316 children (67.3%) eating them during the previous day. Legumes and nuts were the second most consumed, with 316 children (61.5%) ate during previous day. On the other hand, flesh foods (meat, poultry, fish**)** were among the least consumed, with only 136 children (26.5%) (Table 5).

Table 5:-Consumption of food groups for children aged 6 to 23 months attending health in Harar Eastern Ethiopia,2024 (n=514)

Food items	Categories	Frequency	Percent
Breast feeding	No breast feeding	175	34
	Breast feeding	339	66
Grain, roots, and tubers	Not consumed in previous day	168	32.7
	consumed in previous day	316	67.3
Legumes and nuts	Not consumed in previous day	198	38.5
	consumed in previous day	316	61.5
Dairy products	Not consumed in previous day	266	51.8
	consumed in previous day	248	48.2
Flesh foods (meat, poultry, fish)	Not consumed in previous day	378	73.5
	consumed in previous day	136	26.5
Egg	Not consumed in previous day	241	46.9
	consumed in previous day	273	53.1
Vitamin A rich fruits	Not consumed in previous day	332	64.6
	consumed in previous day	182	35.4
Other fruits and vegetables	Not consumed in previous day	316	61.5
	consumed in previous day	198	38.5
Overall Dietary Diversity	Good	173	33.7
	Poor	341	66.3

Regarding to house hold food security status, the average HFIAS score was 2.38 with a standard deviation of 0.98. The median score stood at 2.00, and the interquartile range (IQR) extended from 2.00 to 3.00 showing that the central 50% of households experience low levels of food insecurity. The scores ranged from a minimum of 0.00 to a maximum of 27.00. The breakdown showed that 105 households (20.4%) were classified as food secure, 189 households (36.8%) as mildly food secure, 139 households (27%) as moderately food secure and 81 households (15.8%) as severely food insecure out of 514 households.

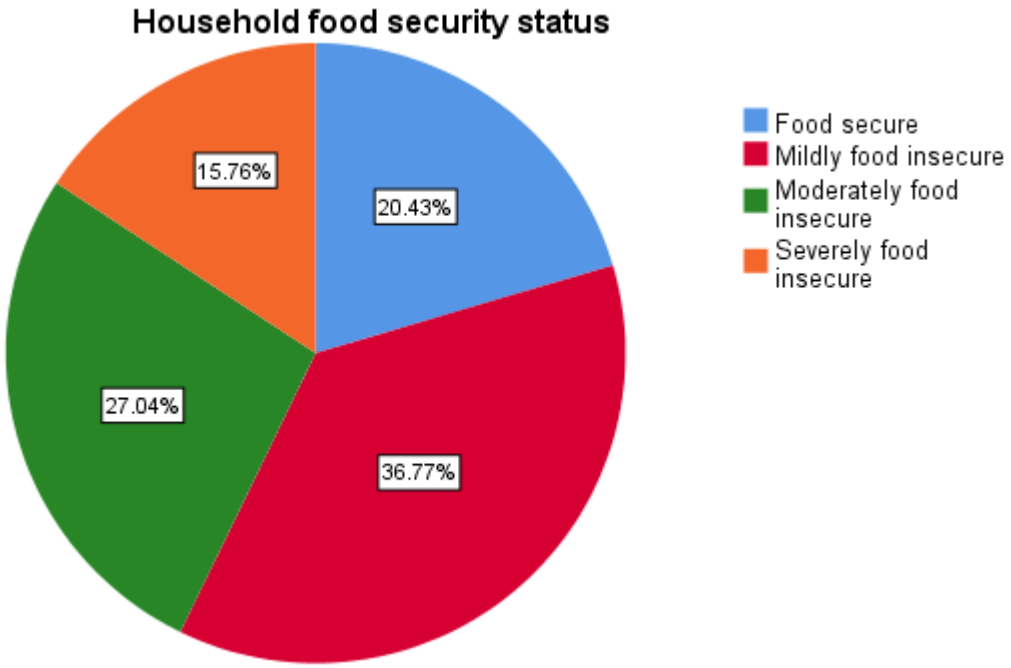

Figure 3:- Household food security level among mothers/care givers in Harar, Eastern Ethiopia 2024 (n=514)

4.6 Magnitude of minimum meal frequency among children

The overall MMF of children was 61.5% (95% CI: 57%, 65%) of the participants. Among the participants, 161 (78.9%) of currently breastfeeding infants aged 6–8 months and 97 (54.2%) of those aged 9–23 months met the minimum meal frequency, respectively. Regarding non-breastfeeding infants 24 hours prior to this survey, only 58 (44.3%) met the minimum meal frequency (Table 6).

Table 6:-Minimum meal frequency among children aged 6-23 months attending health centers in Harar, Eastern Ethiopia, 2024(n=514)

MMF	Category	Frequency	Percentage
Currently Breast feed children 6-8 month >=2 meal (n=204)	Yes No	161 43	78.9 21.1
Currently Breast feed children 9-23 months>=3 meal (n=179)	Yes No	97 82	54.2 45.8
Non breast feed children 6-23 meal>=4 meal (solod, semi-solid/milk) (n=131)	Yes No	58 73	44.3 55.7
Over all Minimum Meal Frequency (number of minimum meals for their ages) (n=514)	Yes No	316 198	61.5 38.5

4.7 Health Belief Model constructs related to MMF

The Health Belief Model (HBM) constructs provide valuable insights into caregivers' perceptions regarding MMF among children aged 6-23 months. Notably, a significant majority of caregivers (61%) reported high perceived benefits of MMF, indicating a strong belief in the advantages of MMF practice. Additionally, 52% perceived moderate barriers to implementing MMF, suggesting that while many caregivers see the benefits, they also face notable challenges. Furthermore, 35% of caregivers perceived a low susceptibility to health risks associated with inadequate MMF, and 25% perceived a low severity of health consequences, indicating a potential underestimation of the risks involved. These findings are visually represented in the accompanying chart, which highlights the distribution of caregivers across different HBM constructs (figure 4).

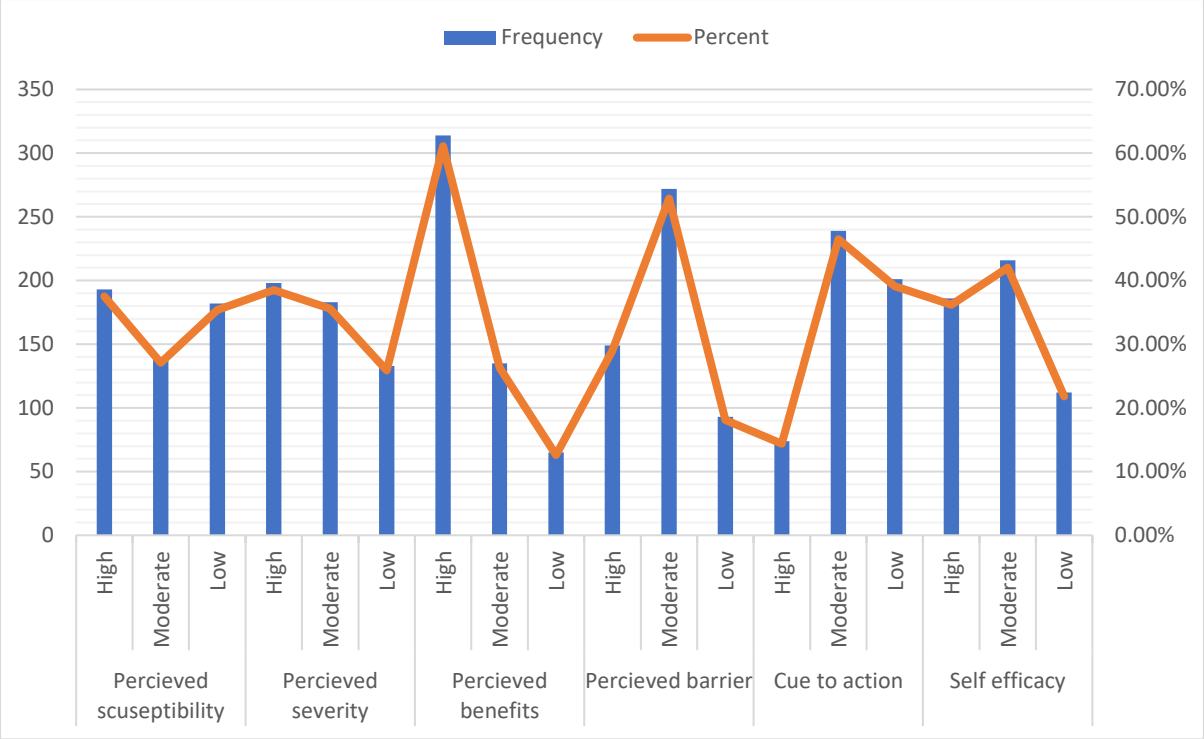

Figure 4:-Distribution of health belief model constructs (HBM) among mothers/care givers in Harar, Eastern Ethiopia,2024

4.8 Factors associated with Minimum Meal Frequency

children aged 6–8 months had significantly higher odds of achieving MMF compared to their older counterparts aged 9–23 months (AOR = 1.85, 95% CI: 1.10–3.12, p = 0.019). Breastfeeding was also identified as a critical predictor of MMF, with breastfed children being more than three times as likely to achieve MMF compared to non-breastfed children (AOR = 3.20, 95% CI: 1.80–5.68, p = 0.001).

Maternal education emerged as another significant factor. Children whose mothers completed primary education showed higher odds of meeting MMF compared to those whose mothers unable to read or write (AOR = 2.40, 95% CI: 1.05–5.45, p = 0.038). Maternal knowledge about MMF practices also played a key role, Maternal knowledge of MMF also influenced the practice, with high knowledge increasing the likelihood of achieving MMF more than threefold relative to low knowledge (AOR = 3.40, 95% CI: 1.40–8.10, p = 0.006).

Household wealth and food security were powerful contributors to MMF outcomes. Children from middle-class, rich, and very rich households had significantly higher odds of achieving

MMF compared to those from very poor households (AOR = 3.80, 95% CI: 1.40–10.1, p = 0.008; AOR = 2.50, 95% CI: 1.02–6.10, p = 0.045; and AOR = 3.20, 95% CI: 1.20–8.50, p = 0.019, respectively). Food-secure households were also associated with higher odds of meeting MMF standards compared to moderately or severely food-insecure households (AOR = 3.10, 95% CI: 1.40–6.70, p = 0.005).

Health service utilization further influenced MMF. Mothers who attend PNC and maternal perceptions further influenced MMF achievement. Mothers who attended PNC were more than three times more likely to meet MMF standards for their children than those who did not (AOR = 3.10, 95% CI: 1.70–5.50, p = 0.001).

Constructs from the Health Belief Model (HBM) also showed relevance, mothers with high perceived susceptibility had higher odds of achieving MMF (AOR = 1.45, 95% CI: 1.05–2.20, p = 0.022), while those with high self-efficacy were more than twice as likely to meet MMF compared to those with low self-efficacy (AOR = 2.05, 95% CI: 1.30–3.25, p = 0.002).

Table 7**:-**Factors associated with minimum meal frequency among 6–23 months of children, in Harar, Eastern Ethiopia, 2024 (n=514)

Independent Variable	**MMF Yes (%)**	**MMF No (%)**	**COR (95% CI)**	**P-value (COR)**	**AOR (95% CI)**	**P-value (AOR)**
Child Age						
9–23 Months (Ref)	128 (54.9%)	105 (45.1%)	1.00	–	1.00	–
6–8 Months	188 (66.9%)	93 (33.1%)	1.70 (1.20–2.35)	0.003	**1.85 (1.10–3.12)**	**0.019**
Breastfeeding Status						
Not Breastfed (Ref)	58 (44.3%)	73 (55.7%)	1.00	–	1.00	–
Breastfed	258 (67.4%)	125 (32.6%)	2.52 (1.70–3.73)	0.004	**3.20 (1.80–5.68)**	**0.001**
Maternal Education						
Cannot Read/Write (Ref)	21 (21.6%)	76 (78.4%)	1.00	–	1.00	–
Primary (1–8)	182 (70.3%)	77 (29.7%)	8.10 (4.60–14.1)	0.001	**2.40 (1.05–5.45)**	**0.038**
Secondary and above	113 (71.5%)	45 (28.5%)	8.80 (4.60–16.8)	0.001	1.70 (0.78–3.80)	0.183
Maternal Knowledge on MMF						
Low Knowledge (Ref)	74 (37.6%)	123 (62.4%)	1.00	–	1.00	–
Moderate Knowledge	129 (73.7%)	46 (26.3%)	4.50 (2.90–6.90)	0.003	1.50 (0.80–2.80)	0.198
High Knowledge	113 (79.6%)	29 (20.4%)	6.70 (4.00–11.0)	0.002	**3.40 (1.40–8.10)**	**0.006**
Wealth Index						
Very Poor (Ref)	22 (20.8%)	84 (79.2%)	1.00	–	1.00	–
Poor	55 (56.1%)	43 (43.9%)	4.80 (2.50–9.00)	0.004	1.60 (0.60–4.30)	0.338
Middle Class	78 (76.5%)	24 (23.5%)	12.0 (6.10–23.9)	0.001	**3.80 (1.40–10.1)**	**0.008**
Rich	86 (81.9%)	19 (18.1%)	16.1 (7.40–34.5)	0.001	**2.50 (1.02–6.10)**	**0.045**
Very Rich	75 (72.8%)	28 (27.2%)	9.80 (5.30–18.1)	0.002	**3.20 (1.20–8.50)**	**0.019**
Household Food Security (merged)						
Moderate/Severe Insecure (Ref)	74 (36.8%)	127 (63.2%)	1.00	–	1.00	–
Mildly Insecure	170 (74.9%)	57 (25.1%)	4.88 (3.15–7.55)	0.003	1.45 (0.75–2.80)	0.272
Food Secure	72 (76.6%)	22 (23.4%)	5.70 (3.20–10.1)	0.002	**3.10 (1.40–6.70)**	**0.005**
Postnatal Care (PNC)						
No PNC (Ref)	100 (43.0%)	132 (57.0%)	1.00	–	1.00	–
Attended PNC	216 (76.6%)	66 (23.4%)	4.20 (2.80–6.10)	0.004	**3.10 (1.70–5.50)**	**0.001**
HBM Constructs						
Perceived Susceptibility — Low (Ref)	100 (55%)	82 (45%)	1.00	–	1.00	–

Moderate	94(67.6%)	45(32.4%)	1.71(1.05-2.78	0.030	1.20(0.72-2.00	0.481
Perceived Susceptibility — High	122 (63.0%)	71(37%)	1.41 (1.05–2.25)	0.020	**1.45(1.05–2.20)**	**0.022**
Self-Efficacy — Low (Ref)	55 (49.1%)	57 (50.9%)	1.00	–	1.00	–
Moderate	136(63.0%)	80(37.0%	1.77(1.10-2.85)	0.018	1.60(0.95-2.70)	0.071
Self-Efficacy — High	125 (67.3%)	61 (32.7%)	2.12 (1.35–3.33)	0.001	**2.05 (1.30–3.25)**	**0.002**

No multicollinearity was detected in the final model, as all independent variables had standard error values below 2. The Hosmer–Lemeshow goodness-of-fit test showed that the model fit the data well ($\chi^2 = 11.47$, df = 8, p = 0.177), indicating no evidence of poor fit. Therefore, the predicted probabilities from the model were consistent with the observed frequencies.

5 DISCUSSION

This facility-based cross-sectional study revealed that 61.5% (95% CI: 57%, 65%) of children attending health centers in Harar, Ethiopia, achieved the recommended Minimum Meal Frequency (MMF). This result is comparable to findings from studies in North West Ethiopia (60%;Ferede et al., 2019) , Dembecha (63%;Mulat et al., 2019), Madagascar (63.98%;Tebeje et al., 2024), and the Gambian Demographic Health Survey (57.95%;Terefe et al., 2023). However, it is lower than the findings from Dabat district, Ethiopia (72%; Belew et al., 2017), China (77.9%; Feng et al., 2022), and India (87.3%; Solanki et al., 2021). These discrepancies could reflect differences in socioeconomic status, cultural feeding practices, and healthcare access across regions. Variations in sample sizes and methodologies may also contribute to the differences.

In contrast, the MMF rate in Harar was higher than in studies conducted among agropastoral communities in Afar (43.8%; Wuneh et al., 2019), North Shoa (33%;Gizaw & Tesfaye, 2019) , North West Ethiopia (50%; Beyene et al., 2015), Tanzania (38.6%; Victor et al., 2014), 2014), India (50.9%;(Ahmad et al., 2017), and China (38%; Ali et al., 2021). This relatively better adherence in Harar may be attributed to improved access to health services and nutrition interventions in urban areas compared to rural or agropastoral settings.

Breastfeeding status was strongly associated with achieving MMF. Breastfeeding children were more than three times as likely to achieve MMF compared to non-breastfeeding children (AOR = 3.20, 95% CI: 1.80–5.68, p = 0.001). Similar findings were reported as breastfeeding children were 7.5 times more likely to achieve minimum meal frequency comparing with their counterparts, AOR = 7.5, 95% CI (3.95, 14.4)(Wagris et al., 2019). Breastfeeding may facilitate achieving MMF as breastfeeding children have fewer required meals compared to non-breastfeeding children. Breastfeeding children tend to have fewer meals per day than non-breastfeeding children. Non-breastfeeding children are required to consume at least four meals per day to meet the criteria for minimum meal frequency, while breastfeeding children often have at least one meal reduction, making it easier for them to achieve the recommended frequency.

Children aged 6–8 months were over twice as likely to achieve MMF compared to older children aged 9–23 months (AOR = 1.85, 95% CI: 1.10–3.12, p = 0.019). This finding aligns

with a study conducted in Tanzania, which reported that the risk of not meeting minimum meal frequency increased as children grew older (AOR = 1.97; 95% CI: 1.48–2.61; p < 0.001) (Victor et al., 2014). Similarly, Demographic and Health Surveys conducted in 32 Sub-Saharan African countries revealed that older children were less likely to meet MMF compared to children aged 6–8 months (AOR = 0.61; 95% CI: 0.58–0.64)(Aboagye et al., 2024). Additional studies, such as one conducted in Woiliata Sodo, Ethiopia, also reported similar trends, indicating that younger children were more likely to achieve MMF(Mekonnen et al., 2017).

In contrast, some research suggests that younger children are less likely to meet MMF compared to older children. For instance, studies conducted in Northwest Ethiopia and other regions reported that children aged 6–11 months had lower odds of achieving MMF compared to children aged 12–23 months(Bikes et al., 2020; Tegegne et al., 2017; Wake, 2021). These discrepancies could be attributed to regional differences in feeding practices, caregiver knowledge, and sociodemographic characteristics. Variations in study design and definitions of MMF may also contribute to these conflicting findings.

The observed higher odds of achieving MMF among younger children (6–8 months) in this study may reflect challenges faced by caregivers in meeting the feeding needs of older children (9–23 months) due to their increased appetite and more complex dietary requirements. Caregivers might also prioritize feeding younger children more frequently, especially in contexts where breastfeeding is common, which could explain the higher adherence to MMF among this age group

Household wealth strongly influenced MMF outcomes. Children from middle, rich and very rich households were had significantly higher odds of meeting MMF (AOR = 3.80; 2.50; and 3.20, respectively). Economic resources play a critical role in ensuring sufficient and frequent meals, as confirmed by previous studies in Ethiopia and other low-income countries (Abebe et al., 2017; Victor et al., 2014; Wake, 2021). Additionally, the demographic health survey data analysis of sub-Saharan African countries also revealed that house hold wealth index is strongly associated with minimum meal frequency(Tebeje et al., 2024). A study conducted in Uganda also indicated that wealth index significantly associated with greater odds of a child reaching the MMF threshold(Scarpa et al., 2022).

Food-secure households were significantly more likely to meet MMF requirements compared to severely food-insecure households (AOR = 3.10, 95% CI: 1.40–6.70, p = 0.005). This aligns

with existing research linking food insecurity to poor child nutrition practices, including reduced meal frequency and dietary diversity(Gatica-Domínguez et al., 2021; Issaka et al., 2015).). These findings suggest that improving MMF requires not only behavior-focused interventions but also broader efforts to address economic barriers.

Mothers attending postnatal care (PNC) visits had three times the odds of achieving MMF for their children compared to those who did not (AOR = 3.10, 95% CI: 1.70–5.50, p = 0.001). This highlights the role of PNC as a platform for providing nutrition education and counselling, consistent with findings from Ethiopia and other low-resource settings(Beyene et al., 2015; Wuneh et al., 2019).

Maternal education and knowledge played a pivotal role in MMF achievement. Children of mothers with primary education were more likely to achieve MMF compared to children of mothers unable to read or write (AOR = 2.40, 95% CI: 1.05–5.45, p = 0.038). Similarly, mothers with high knowledge of MMF practices were nearly four times more likely to achieve MMF compared to those with low knowledge (AOR = 3.40, 95% CI: 1.40–8.10, p = 0.006). These findings emphasize the importance of maternal education and knowledge in shaping child feeding practices.

Furthermore, the study revealed significant associations between health belief model constructs and MMF. Mothers with higher perceived susceptibility to the consequences of inadequate feeding, and higher self-efficacy were more likely to meet MMF requirements. While most mothers reported high perceived benefits and moderate barriers, these constructs were not significant predictors in the multivariate model. Instead, perceived susceptibility and self-efficacy were the strongest predictors of MMF. This demonstrates that although caregivers may understand the benefits of MMF, behavior change is driven more by their perceived personal risk and confidence in their ability to practice appropriate feeding.Similar findings have been reported in studies exploring the role of psychosocial factors in child feeding practices(Kavle et al., 2017; Shloim et al., 2015). Addressing mothers' beliefs and perceptions regarding child feeding is crucial for promoting positive behavioral change, as demonstrated by previous studies utilizing the health belief model in nutrition interventions (Glanz K, Rimer B, Viswanath K, 2015).

These findings underscore the multifaceted nature of MMF determinants, encompassing child, maternal, household, and behavioural dimensions. They highlight the need for integrated

interventions focusing on breastfeeding promotion, maternal education, postnatal care access, food security, and maternal empowerment to close MMF gaps effectively.

6 CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

This study revealed that 61.5% of children in Harar, Ethiopia, met the minimum meal frequency (MMF), highlighting significant disparities linked to socioeconomic, maternal, and psychosocial factors. Key predictors of MMF adherence included breastfeeding status, household wealth, and maternal attendance at postnatal care visits. Conversely, older children faced greater challenges in achieving MMF, while maternal illiteracy and low knowledge of MMF further reduced compliance. The health belief model constructs—such as perceived susceptibility, barriers, and self-efficacy also played a crucial role in shaping feeding behaviors. These findings underscore the importance of addressing both economic and educational gaps to improve child feeding practices.

6.2 RECOMMENDATIONS

To enhance MMF adherence, interventions should focus on economic empowerment strategies and targeted maternal education programs. Strengthening postnatal care services to provide comprehensive nutrition counseling could significantly improve outcomes. Additionally, addressing psychosocial factors through community-based initiatives could foster positive behavioral change. Future efforts should prioritize multisectoral approaches to reduce food insecurity and enhance healthcare equity, ultimately improving child nutrition outcomes in similar settings. By addressing these multifaceted challenges, policymakers and practitioners can develop more effective strategies to support optimal child feeding practices and overall child health.

Economic Empowerment Programs: Implement economic support programs, such as cash transfers or livelihood enhancement initiatives, to improve household wealth and reduce poverty, thereby enabling families to provide adequate meals for their children.

Maternal Education and Awareness: Develop targeted maternal education programs focusing on improving knowledge about minimum meal frequency (MMF) and optimal child feeding practices. These programs should be tailored to address the needs of illiterate mothers and those with low MMF knowledge.

Strengthening Postnatal Care Services: Enhance postnatal care services by integrating comprehensive nutrition counseling and education on infant and young child feeding practices. This could include training healthcare providers to deliver consistent and accurate information to mothers.

Addressing Psychosocial Factors: Implement community-based interventions that address psychosocial factors influencing feeding behaviors, such as perceived susceptibility, barriers, and self-efficacy. These interventions should aim to promote positive behavioral change among caregivers.

Food Security Initiatives: Develop and implement initiatives to reduce household food insecurity, which is a significant barrier to achieving MMF. This could involve food assistance programs or support for local agriculture to improve food availability.

Multisectoral Collaboration: Foster collaboration between health, education, and social welfare sectors to develop and implement policies that address the multifaceted challenges affecting child feeding practices. This includes ensuring access to healthcare services and promoting equitable distribution of resources.

7 REFERENCES

Abebe, Z., Haki, G. D., & Baye, K. (2017). Child feeding style is associated with food intake and linear growth in rural Ethiopia. *Appetite*, *116*, 132–138. https://doi.org/10.1016/j.appet.2017.04.033

Aboagye, R. G., Seidu, A.-A., Ahinkorah, B. O., Cadri, A., Frimpong, J. B., Dadzie, L. K., Budu, E., Eyawo, O., & Yaya, S. (2024). Prevalence and predictors of infant and young child feeding practices in sub-Saharan Africa. *International Health*, *16*(1), 68–82. https://doi.org/10.1093/inthealth/ihad022

Ahmad, I., Khalique, N., Khalil, S., Urfi, & Maroof, M. (2017). Complementary feeding practices among children aged 6–23 months in Aligarh, Uttar Pradesh. *Journal of Family Medicine and Primary Care*, *6*(2), 386. https://doi.org/10.4103/jfmpc.jfmpc_281_16

Ali, M., Arif, M., & Shah, A. A. (2021). Complementary feeding practices and associated factors among children aged 6–23 months in Pakistan. *PLOS ONE*, *16*(2), e0247602. https://doi.org/10.1371/journal.pone.0247602

Baye, K., & Kennedy, G. (2018). *Estimates of Dietary Quality in Infants and Young Children (6-23 Months): Evidence from Demographic and Health Surveys of 48 Low-And Middle-Income Countries'* (SSRN Scholarly Paper No. 3279184). https://doi.org/10.2139/ssrn.3279184

Belew, A. K., Ali, B. M., Abebe, Z., & Dachew, B. A. (2017). Dietary diversity and meal frequency among infant and young children: A community based study. *Italian Journal of Pediatrics*, *43*(1), 73. https://doi.org/10.1186/s13052-017-0384-6

Beyene, M., Worku, A. G., & Wassie, M. M. (2015). Dietary diversity, meal frequency and associated factors among infant and young children in Northwest Ethiopia: A cross- sectional study. *BMC Public Health*, *15*, 1007. https://doi.org/10.1186/s12889-015-2333-x

Bikes, G. A., Tariku, A., Wassie, M. M., Mekonnen, S., Muhammad, E. A., Belew, A. K., Abebe, Z., Gete, A. A., Yesuf, M. E., Awoke, T., Fekadu, A., Gebeye, E., Kebede, Y., Alemu, K., Addis, A., Fentahun, K., Sisay, M., Gonete, K. A., & Hunegnaw, M. T. (2020). *Factors associated with minimum dietary diversity and meal frequency among children aged 6-59 months in northwest Ethiopia: Finding from the baseline survey of nutrition project*. https://doi.org/10.21203/rs.3.rs-32792/v1

Brhane, E., Grum, T., Abraha, T. H., & Aregawi, G. (2020). *Meal frequency and associated factors among children 6-23 months in Tahtay michew district, northern Ethiopia, 2018*. https://doi.org/10.21203/rs.3.rs-70779/v1

Coates, J., Swindale, A., & Bilinsky, P. (2007). *Household Food Insecurity Access Scale (HFIAS) for Measurement of Food Access: Indicator Guide: Version 3: (576842013-001)* [Dataset]. https://doi.org/10.1037/e576842013-001

Dadzie, L. K., Amo-Adjei, J., & Esia-Donkoh, K. (2021). Women empowerment and minimum daily meal frequency among infants and young children in Ghana: Analysis of Ghana demographic and health survey. *BMC Public Health*, *21*(1), 1700. https://doi.org/10.1186/s12889-021-11753-1

Epheson, B., Birhanu, Z., Tamiru, D., & Feyissa, G. T. (2018). Complementary feeding practices and associated factors in Damot Weydie District, Welayta zone, South Ethiopia. *BMC Public Health*, *18*(1), 419. https://doi.org/10.1186/s12889-018-5245-8

EPHI. (2019). *Ethiopian Public Health Institute (EPHI) [Ethiopia] and ICF. 2021. Ethiopia Mini Demographic and Health Survey 2019: Final Report. Rockville, Maryland, USA: EPHI and ICF.*

FAO, F. (2016). *Minimum Dietary Diversity for Women: A Guide for Measurement*.

Feng, J., Gong, Z., Wang, Y., Huo, J., & Zhuo, Q. (2022). Complementary Feeding and Malnutrition among Infants and Young Children Aged 6–23 Months in Rural Areas of China. *Nutrients*, *14*(9), Article 9. https://doi.org/10.3390/nu14091807

Ferede, A. B., Bikes, G. A., & Gebremichael, T. G. (2019). *Appropriate Complementary Feeding Practice and associated factors among mothers with children age 6- 23 months in Faggeta-Lekoma District, Northwest Ethiopia: Community- based cross - sectional study*. In Review. https://doi.org/10.21203/rs.2.12833/v2

Gatica-Domínguez, G., Neves, P. A. R., Barros, A. J. D., & Victora, C. G. (2021). Complementary Feeding Practices in 80 Low- and Middle-Income Countries: Prevalence of and Socioeconomic Inequalities in Dietary Diversity, Meal Frequency, and Dietary Adequacy. *The Journal of Nutrition*, *151*(7), 1956–1964. https://doi.org/10.1093/jn/nxab088

Gewa, C. A., & Leslie, T. F. (2015). Distribution and determinants of young child feeding practices in the East African region: Demographic health survey data analysis from 2008-2011. *Journal of Health, Population and Nutrition*, *34*(1), 6. https://doi.org/10.1186/s41043-015-0008-y

Gizaw, G., & Tesfaye, G. (2019). Minimum Acceptable Diet and Factor Associated with It Among Infant and Young Children Age 6-23 Months in North Shoa, Oromia Region, Ethiopia. *International Journal of Homeopathy & Natural Medicines*, *5*(1), 1. https://doi.org/10.11648/j.ijhnm.20190501.11

Glanz K, Rimer B, Viswanath K. (2015). *Health Behaviour: Theory, Research and Practice* (4th ed.). Jossey-Bass.

Hayden, J. A. (2019). *Introdiction to Health Behavior Theory* (3rd ed.). jones & Bartlett.

Issaka, A. I., Agho, K. E., Ezeh, O. K., & Renzaho, A. M. (2017). Population-attributable risk estimates for factors associated with inappropriate complementary feeding practices in The Gambia. *Public Health Nutrition*, *20*(17), 3135–3144. https://doi.org/10.1017/S1368980017002014

Issaka, A. I., Agho, K. E., Page, A. N., Burns, P. L., Stevens, G. J., & Dibley, M. J. (2015). Determinants of suboptimal complementary feeding practices among children aged 6–23 months in four anglophone W est A frican countries. *Maternal & Child Nutrition*, *11*(S1), 14–30. https://doi.org/10.1111/mcn.12194

Janz, N. K., & Becker, M. H. (1984). The Health Belief Model: A Decade Later. *Health Education Quarterly*, *11*(1), 1–47. https://doi.org/10.1177/109019818401100101

Kamran, A., Sharifirad, G., Nasiri, K., Soleymanifard, P., Savadpour, M., & Akbar Haghighat, M. (2017). Determinants of Complementary Feeding Practices among Children Aged 6-23: A Community based Study. *International Journal of Pediatrics*, *5*(3), 4551–4560. https://doi.org/10.22038/ijp.2016.7811

Kassa, T., Meshesha, B., Haji, Y., & Ebrahim, J. (2016). Appropriate complementary feeding practices and associated factors among mothers of children age 6–23 months in Southern Ethiopia, 2015. *BMC Pediatrics*, *16*(1), 131. https://doi.org/10.1186/s12887-016-0675-x

Kavle, J. A., LaCroix, E., Dau, H., & Engmann, C. (2017). Addressing barriers to exclusive breast-feeding in low- and middle-income countries: A systematic review and programmatic implications. *Public Health Nutrition*, *20*(17), 3120–3134. https://doi.org/10.1017/S1368980017002531

Kram, N., Melgen, S., Kedera, E., Collison, D. K., Colton, J., Blount, W., Grant, F., & Girard, A. W. (2016). The acceptability of dietary tools to improve maternal and child nutrition in Western Kenya. *Public Health Nutrition*, *19*(10), 1823–1833. https://doi.org/10.1017/S1368980015003213

Masuke, R., Msuya, S. E., Mahande, J. M., Diarz, E. J., Stray-Pedersen, B., Jahanpour, O., & Mgongo, M. (2021). Effect of inappropriate complementary feeding practices on the nutritional status of children aged 6-24 months in urban Moshi, Northern Tanzania: Cohort study. *PLOS ONE*, *16*(5), e0250562. https://doi.org/10.1371/journal.pone.0250562

Mekonnen, T. C., Workie, S. B., Yimer, T. M., & Mersha, W. F. (2017). Meal frequency and dietary diversity feeding practices among children 6–23 months of age in Wolaita Sodo town, Southern Ethiopia. *Journal of Health, Population and Nutrition*, *36*(1), 18. https://doi.org/10.1186/s41043-017-0097-x

Mirzaei, A., Esmaeili, F. P., & Jalilian, M. (2020). Predictors of complementary feeding in infants aged 6 to 18 months: An application of Health Belief Model. *Sri Lanka Journal of Child Health*, *49*(1), 48. https://doi.org/10.4038/sljch.v49i1.8898

Mitchodigni, I., Hounkpatin, W., Ntandou-Bouzitou, G., Termote, C., Kennedy, G., & Hounhouigan, D. (2017). Complementary Feeding Practices of Children Aged 6-23 Months in Rural Area, Southern-Benin: Challenges and Opportunities. *International Journal of TROPICAL DISEASE & Health*, *24*(2), 1–12. https://doi.org/10.9734/IJTDH/2017/33877

Mulat, E., Alem, G., Woyraw, W., & Temesgen, H. (2019). Uptake of minimum acceptable diet among children aged 6–23 months in orthodox religion followers during fasting season in rural area, DEMBECHA, north West Ethiopia. *BMC Nutrition*, *5*(1), 18. https://doi.org/10.1186/s40795-019-0274-y

Mulualem, D., Henry, C. J., Berhanu, G., & Whiting, S. J. (2016). The effectiveness of nutrition education: Applying the Health Belief Model in child-feeding practices to use pulses for complementary feeding in Southern Ethiopia. *Ecology of Food and Nutrition*, *55*(3), 308–323. https://doi.org/10.1080/03670244.2016.1161617

Na, M., Aguayo, V. M., Arimond, M., & Stewart, C. P. (2017). Risk factors of poor complementary feeding practices in Pakistani children aged 6–23 months: A multilevel analysis of the Demographic and Health Survey 2012–2013. *Maternal & Child Nutrition*, *13*(S2), e12463. https://doi.org/10.1111/mcn.12463

Rosenstock, I. M. (1974). Historical Origins of the Health Belief Model. *Health Education Monographs*, *2*(4), 328–335. https://doi.org/10.1177/109019817400200403

Rutstein,Shea O., K. J., K. (2004). *The DHS Wealth Index*. ORC Macrp.

Saaka, M., Larbi, A., Mutaru, S., & Hoeschle-Zeledon, I. (2016). Magnitude and factors associated with appropriate complementary feeding among children 6–23 months in Northern Ghana. *BMC Nutrition*, *2*(1), 2. https://doi.org/10.1186/s40795-015-0037-3

Sarrassat, S., Ganaba, R., Some, H., Cresswell, J. A., Diallo, A. H., Cousens, S., & Filippi, V. (2019). Suboptimal infant and young child feeding practices in rural Boucle du Mouhoun, Burkina Faso: Findings from a cross-sectional population-based survey. *PLOS ONE*, *14*(11), e0224769. https://doi.org/10.1371/journal.pone.0224769

Scarpa, G., Berrang-Ford, L., Galazoula, M., Kakwangire, P., Namanya, D. B., Tushemerirwe, F., Ahumuza, L., & Cade, J. E. (2022). Identifying Predictors for Minimum Dietary Diversity and Minimum Meal Frequency in Children Aged 6–23 Months in Uganda. *Nutrients*, *14*(24), 5208. https://doi.org/10.3390/nu14245208

Senarath, U., Agho, K. E., Akram, D.-S., Godakandage, S. S. P., Hazir, T., Jayawickrama, H., Joshi, N., Kabir, I., Khanam, M., Patel, A., Pusdekar, Y., Roy, S. K., Siriwardena, I., Tiwari, K., & Dibley, M. J. (2012). Comparisons of complementary feeding indicators and associated factors in children aged 6–23 months across five South Asian countries. *Maternal & Child Nutrition*, *8*(s1), 89–106. https://doi.org/10.1111/j.1740-8709.2011.00370.x

Shloim, N., Edelson, L. R., Martin, N., & Hetherington, M. M. (2015). Parenting Styles, Feeding Styles, Feeding Practices, and Weight Status in 4–12 Year-Old Children: A Systematic Review of the Literature. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.01849

Solanki, K. H., Parande, M. A., Salunke, N. M., Sangwan, K., & Tambe, M. P. (2021). Association of minimum dietary diversity and minimum meal frequency with anthropometric parameters among children of 6 to 23 months of age attending immunization clinic of a tertiary care hospitals.

International Journal Of Community Medicine And Public Health, *9*(1), 166. https://doi.org/10.18203/2394-6040.ijcmph20214990

Tebeje, T. M., Abebe, M., Tesfaye, S. H., Seboka, B. T., Argaw, G. S., Seifu, B. L., Mare, K. U., & Aragaw, F. M. (2024). Minimum meal frequency and associated factors among children aged 6–23 months in Sub-Saharan Africa: A multilevel analysis of the demographic and health survey data. *Frontiers in Public Health*, *12*, 1468701. https://doi.org/10.3389/fpubh.2024.1468701

Tegegne, M., Sileshi, S., Benti, T., Teshome, M., & Woldie, H. (2017). Factors associated with minimal meal frequency and dietary diversity practices among infants and young children in the predominantly agrarian society of Bale zone, Southeast Ethiopia: A community based cross sectional study. *Archives of Public Health*, *75*(1), 53. https://doi.org/10.1186/s13690-017-0216-6

Teji Roba, K. (2016). Infant and Young Child Feeding (IYCF) Practices Among Mothers of Children Aged 6–23 Months in Two Agro-ecological Zones of Rural Ethiopia. *International Journal of Nutrition and Food Sciences*, *5*(3), 185. https://doi.org/10.11648/j.ijnfs.20160503.16

Terefe, B., Jembere, M. M., & Abie Mekonnen, B. (2023). Minimum meal frequency practice and associated factors among children aged 6–23 months old in The Gambia: A multilevel mixed effect analysis. *Scientific Reports*, *13*(1), 22607. https://doi.org/10.1038/s41598-023-49748-0

Tesfie, T. K., Endalew, B., Birhanu, M. Y., Haimanot, A. B., Mneneh, A. L., Mengie, M. G., Mazengia, E. M., Simegn, M. B., Agimas, M. C., Derseh, N. M., Argaw, G. S., & Tilahun, W. M. (2024). Spatial distribution of inadequate meal frequency and its associated factors among children aged 6–23 months in Ethiopia: Multilevel and spatial analysis. *PLOS ONE*, *19*(7), e0306646. https://doi.org/10.1371/journal.pone.0306646

UNICEF. (2020). *Improving Young Children's Diets During the Complementary Feeding Period. UNICEF Programming Guidance. New York:*

UNICEF. (2021). *UNICEF Conceptual Framework on Maternal and Child Nutrition*.

UNICEF. (2023). *United Nations Children's Fund, Division of Data, Analysis, Planning and Monitoring (2023). Global UNICEF Global Databases: Infant and Young Child Feeding: Introduction to solids, semi-solids and soft foods, New York, December 2023*.

Victor, R., Baines, S. K., Agho, K. E., & Dibley, M. J. (2014). Factors associated with inappropriate complementary feeding practices among children aged 6–23 months in Tanzania. *Maternal & Child Nutrition*, *10*(4), 545–561. https://doi.org/10.1111/j.1740-8709.2012.00435.x

Wagris, M., Seid, A., Kahssay, M., & Ahmed, O. (2019a). Minimum Meal Frequency Practice and Its Associated Factors among Children Aged 6–23 Months in Amibara District, North East Ethiopia. *Journal of Environmental and Public Health*, *2019*, 8240864. https://doi.org/10.1155/2019/8240864

Wagris, M., Seid, A., Kahssay, M., & Ahmed, O. (2019b). Minimum Meal Frequency Practice and Its Associated Factors among Children Aged 6–23 Months in Amibara District, North East Ethiopia. *Journal of Environmental and Public Health*, *2019*, 1–7. https://doi.org/10.1155/2019/8240864

Wake, A. D. (2021). Prevalence of Minimum Meal Frequency Practice and Its Associated Factors among Children Aged 6 to 23 Months in Ethiopia: A Systematic Review and Meta-analysis. *Global Pediatric Health*, *8*, 2333794X211026184. https://doi.org/10.1177/2333794X211026184

White, J. M., Bégin, F., Kumapley, R., Murray, C., & Krasevec, J. (2017). Complementary feeding practices: Current global and regional estimates. *Maternal & Child Nutrition*, *13*(S2), e12505. https://doi.org/10.1111/mcn.12505

WHO. (2021). *Indicators for assessing infant and young child feeding practices: Definitions and measurement methods. Geneva: World Health Organization and the United Nations Children's Fund (UNICEF), 2021. Licence: CC BYNC-SA 3.0 IGO.*

WHO. (2023). *WHO Guideline for complementary feeding of infants and young children 6–23 months of age*.

Wuneh, A. G., Ahmed, W., Bezabih, A. M., & Reddy, P. S. (2019). Dietary Diversity and Meal Frequency Practices among Children Aged 6-23 Months in Agro Pastoral Communities in Afar Region, Ethiopia: A Cross-sectional Study. *Ecology of Food and Nutrition*, *58*(6), 575–596. https://doi.org/10.1080/03670244.2019.1644328

Yunitasari, E., Al Faisal, A. H., Efendi, F., Kusumaningrum, T., Yunita, F. C., & Chong, M. C. (2022). Factors associated with complementary feeding practices among children aged 6–23 months in Indonesia. *BMC Pediatrics*, *22*(1), 727. https://doi.org/10.1186/s12887-022-03728-x

8 ANNEXES

8.1 Information Sheet and Informed Voluntary Consent Form for Head of Health Center

1.Introduction: My Name is Bereketabe Nega. I am the Principal Investigator of the study to be conducted in this health center. I kindly request you to lend me your attention to explain to you about the study and your Health centers being selected as the study setting.
2.Title of the study: Minimum Meal Frequecy and associated factors among Children Aged 6-23 Months Attending Health Centers in Harar city, Harari Region, Eastern Ethiopia
3.Purpose/aim of the study: The results of this study hold significant value for the Harari region health bureau in devising intervention programs. These programs aim to enhance awareness about issues related to minimum meal frequency among within the community and beyond, thereby improving overall understanding of infant and young children feeding practice. Furthermore, the key purpose of this study is to contribute to a thesis, which is partially fulfilling the requirements for a Master's degree in Public Health Nutrition.
4.Procedure and duration: During visits to the health center, data collectors will conduct interviews with mothers or caregivers. They use a questionnaire to gather relevant data for the study. Other data collectors will complete the questionnaire through these interviews, which are expected to last between 20 to 40 minutes. It will have 87 questions in six parts. This process ensures that we collect comprehensive and valuable data for our research.
4.Risk and benefits: The study poses minimal risks to participants, and minor inconvenience being the brief amount of time required for participation. While this study does not offer any financial rewards, the insights gained from the research could provide valuable information for local health planning initiatives

6.Confidentiality: The data provided by participants will be treated with utmost confidentiality. No identifiable information collected that could single out an individual participant. The study's results wiil be generalized and not disclose any specific details about individual participants. To ensure anonymity, the questionnaires will be coded and will not include the names of the participants.

7.Rights:The participants have the right to declare to participate or not in this study. If they decide to participate, they have the right to withdraw from the study at any time and this will not label them for any loss of benefits which they otherwise are entitled. They do not have to answer any question that they do not want to answer. The Health center has also the right to stop this study from being conducted if any misdeeds and unethical procedures are observed during the data collection process in the Hospital's premises.

8.Contact address: Should you have any queries or require further information about the study or its procedures at any time, please feel free to reach out to the Principal Investigator, Bereletabe Nega. He can be contacted at the following phone numbers: +251912043358, or via email at bereketaben@gmail.com. Additionally, you may also contact the Institutional Health Research Ethics Review Committee (IHRERC), responsible for overseeing this study, at their office phone number 0254662011 or through mail at P.O.Box 235, Harar, Ethiopia.

9.**Declaration of informed voluntary consent**

I have read the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that participants have the right to withdraw from the study at any time or not to answer any question that they do not want. I am also informed that the Health center has the right to stop this study from being conducted if any misdeeds and unethical procedures are observed during the data collection process in the Hospital's premises. Therefore, I declare my voluntary consent on behalf of (_____) management to allow this study to be conducted in the health center's premises with my initials (signature).

Name and Signature of Head of the Health center:_____ _____ Date _____

Name and Signature of the PI:_____ _____ Date _____

N.B

This is signed face to face in the presence of the PI.

Please provide a copy of this signed consent to the responsible head.

8.2 Participant Information Sheet and Informed Voluntary Consent Form for mothers or caregivers attending health center. (ages >= 18 years)

Introduction: My name is _____I am working as a data collector for this study being conducted in this Health Center by Bereketabe Nega who is studying for his Master's degree at Haramaya University, the College of Health and Medical Sciences. I kindly request you to lend me your attention to explain you about the study and being selected as the study participant.

Title of the study: Minimum Meal Frequecy and associated factors among Children Aged 6-23 Months Attending Health Centers in Harar city, Harari Region, Eastern Ethiopia

Purpose/aim of the study: The results of this study hold significant value for the Harari regional health bureau in devising intervention programs. These programs aim to enhance awareness about issues related to minimum meal frequency among within the community and beyond, thereby improving overall understanding of infant and young children feeding practice . Furthermore, the key objective of this study is to contribute to a thesis, which is partially fulfilling the requirements for a Master's degree in Public Health Nutrition.

Procedure and duration: During visits to the health center, I will conduct interviews with you. I use a questionnaire to gather relevant data for the study. The interview is expected to last between 20 to 40 minutes. It will have 87 questions in six parts. This process ensures that we collect comprehensive and valuable data for our research.

Risk and benefits: The study poses minimal risks to participants, and minor inconvenience being the brief amount of time required for participation. While this study does not offer any financial rewards, the insights gained from the research could provide valuable information for local health planning initiatives

Confidentiality: The data provided by participants will be treated with utmost confidentiality. No identifiable information collected that could single out you. The study's results wiil be generalized and not disclose any specific details about individual participants. To ensure anonymity, the questionnaires will be coded and will not include the names of the participants.

Right: Participation for this study is fully voluntary. You have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Contact address: Should you have any queries or require further information about the study or its procedures at any time, please feel free to reach out to the Principal Investigator, Bereletabe Nega. He can be contacted at the following phone numbers: +251912043358, or via email at bereketaben@gmail.com. Additionally, you may also contact the Institutional Health Research Ethics Review Committee (IHRERC), responsible for overseeing this study, at their office phone number 0254662011 or through mail at P.O.Box 235, Harar, Ethiopia.

9. Declaration of informed voluntary consent:

I have read/ was read to me the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that I have the right to withdraw from the study at any time or not to answer any question that I do not want. Therefore, I declare my voluntary consent to participate in this study with my initials (signature).

Name and signature of participant:_____ _____ Date _____

Name and signature of Data Collector:_____ _____ Date _____

N.B

- This is signed face to face in the presence of the data collector.
- Please provide a copy of this signed consent to the participant.
- If the participant is a lay person and cannot sign initials, can put his/her thumb print in front of a competent witness; and the witness has to sign alongside (with his/her name and address).

8.3 Participant Information Sheet and Informed Voluntary Consent Form for Parents/Guardians of participants (Minors age < 18 years)

1. Introduction:My name is (_____). I am working as a data collector for the study being conducted in this community by Bereketabe Nega who is studying for his/her Master's degree at Haramaya University, the College of Health and Medical Sciences. Your child is randomly selected to be participant in this study. I kindly request you to lend me your attention to explain you about the study and the child's participation.
2. The study/project title: Minimum Meal Frequecy and associated factors among Children Aged 6-23 Months Attending Health Centers in Harar city, Harari Region, Eastern Ethiopia
3. Purpose/aim of the study:
The results of this study hold significant value for the Harari regional health bureau in devising intervention programs. These programs aim to enhance awareness about issues related to minimum meal frequency among within the community and beyond, thereby improving overall understanding of infant and young children feeding practice . Furthermore, a key objective of this study is to contribute to a thesis, which is partially fulfilling the requirements for a Master's degree in Public Health Nutrition.
4. Procedure and duration:
During visits to the health center, I will conduct interviews with mothers or caregivers. They use a questionnaire to gather relevant data for the study. The interviews are expected to last between 20 to 40 minutes. It will have 87 questions in six parts. This process ensures that we collect comprehensive and valuable data for our research.
5. Risks and benefits:
The study poses minimal risks to participants, and minor inconvenience being the brief amount of time required for participation. While this study does not offer any financial rewards, the insights gained from the research could provide valuable information for local health planning initiatives
6. Confidentiality:

The data provided by participants will be treated with utmost confidentiality. No identifiable information collected that could single out your child. The study's results wiil be generalized and not disclose any specific details about individual participants. To ensure anonymity, the questionnaires will be coded and will not include the names of the participants.

7. Rights:
Participation for this study is fully voluntary. Your daughter and her child have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

8. Contact address:
If there are any questions or enquires any time about the study or the procedures, please contact: [Principal Investigator Bereketabe Nega , Mobile phone: 091204335, email: bereketaben@gmail.com; contact address of the responsible Institutional Health Research Ethics Review Committee (IHRERC) , office phone 0254662011 or P.O.Box 235, Harar, Ethiopia].

9. Declaration of informed voluntary consent:

I have read/ was read to me the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that I have the right to withdraw my child from the study at any time or not to answer any question that I do not want. Therefore, I declare my voluntary consent to allow my child to participate (be involved) in this study with my initials (signature).

Name of the participant: _____ (Assent affirmed if a minor age of 12-17 years ☐)

Name and signature of parent/legal guardian: _____ _____ Date: _____

Name and signature of Data Collector:_____ Date: _____

N.B

- This is signed face to face in the presence of the data collector.
- **Please provide a copy of this signed consent to the participant's legal representative.**
- **If the representative (parent/guardian) is lay person and cannot sign initials, can put his/her thumb print in front of a competent witness; and the witness has to sign alongside (with his/her name and address).**
- **If the participant is in the age range of 12-17 years, an assent (oral or written) may also be required from the minor on top of the parental/guardian consent.**

8.4 Participant Information Sheet and Informed Voluntary Consent Form for mothers or caregivers attending health center. (Amharic version) (Age >=18 ዓመት)

1. **መግቢያ፡** ስሜ _____ እባላለው በዚህ ጤና ጣቢያ በበረከትአብ ነጋ እየተካሄደ ላለው ጥናት መረጃ ሰብሳቢ ሆኜ እየሰራሁ ነው በሃሮማያ ዩኒቨርሲቲ በጤናና ህክምና ሳይንስ ኮሌጅ ሁለተኛ ዲግሪውን እየተማረ ነው። ስለ ጥናቱ እና የጥናት ተካፋይ ሆኖ መመረጥዎን ለማስረዳት ትኩረትዎን እንዲሰጡኝ በአክብሮት እጠይቃለሁ።

2. **የጥናቱ ርዕስ**፡- ከ6-23 ወራት እድሜ ክልል ውስጥ የሚገኙ ህጻናት አነስተኛ የምግብ ድግግሞሽ እና ተያያዥ ምክንያቶች በምስራቅ ኢትዮጵያ ሀረር ከተማ በሐረር ከተማ ጤና ጣቢያዎች።

3. **የጥናቱ ዓላማ/ዓላማ፡-** የዚህ ጥናት ውጤት ለክልሉ ጤና ቢሮ የጣልቃ ገብነት መርሃ ግብሮችን በመንደፍ ከፍተኛ ጠቀሜታ አለው። የዚህ ጥናት ውጤት ለክልሉ ጤና ቢሮ የጣልቃገብነት መርሃ ግብሮችን በመንደፍ ከፍተኛ ጠቀሜታ አለው። እነዚህ መርሃ ግብሮች በማህበረሰቡ ውስጥ እና ከዚያም በላይ ባለው አነስተኛ የምግብ ድግግሞሽ ጉዳዮች ላይ ግንዛቤን ለማጎልበት እና የጨቅላ እና ትንንሽ ህጻናትን የመመገብ ልምምድ አጠቃላይ ግንዛቤን ለማሻሻል ነው። በተጨማሪም የዚህ ጥናት ዋና ዓላማ በሕዝብ ጤና የተመጣጠነ ምግብ ውስጥ ለማስተርስ ዲግሪ የሚያስፈልጉትን ነገሮች በከፊል የሚያሟላ ለቲሲስ ማበርከት ነው።

4. **አሰራር እና የቆይታ ጊዜ**፡- ወደ ጤና ጣቢያው በሚጎበኙበት ወቅት መረጃ ሰብሳቢዎች ከእናቶች ወይም ተንከባካቢዎች ጋር ቃለ መጠይቅ ያደርጋሉ። ለጥናቱ አስፈላጊ መረጃዎችን ለመሰብሰብ መጠይቁን ይጠቀማሉ። ሌሎች መረጃ ሰብሳቢዎች መጠይቁን በእነዚህ ቃለመጠይቆች ያጠናቅቃሉ፣ እነዚህም ከ20 እስከ 40 ደቂቃዎች እንደሚቆዩ ይጠበቃል።በስድስት ክፍሎች 87 ጥያቄዎች ይኖሩታል ይህ ሂደት ለጥናታችን አጠቃላይ እና ጠቃሚ መረጃዎችን እንደምንሰበስብ ያረጋግጣል።

5. **ስጋት እና ጥቅማጥቅሞች፡** ጥናቱ በተሳታፊዎች ላይ ምንም አይነት አደጋ አይኖረውም ለመሳተፍ የሚያስፈልገው አጭር ጊዜ ብቻ ነው. ይህ ጥናት ምንም አይነት የገንዘብ ሽልማቶችን ባይሰጥም፣ ከጥናቱ የተገኙ ግንዛቤዎች ለአካባቢያዊ የጤና እቅድ ውጥኖች ጠቃሚ መረጃ ሊሰጡ ይችላሉ።

6. **ሚስጥራዊነት**፡- በተሳታፊዎች የቀረበው መረጃ በከፍተኛ ሚስጥራዊነት ይያዛልል። አንድን ግለሰብ ሊለይ የሚችል ምንም አይነት መረጃ አይሰበሰብም። የጥናቱ ውጤት አጠቃላይ ይሆናል እና ስለ ግለሰብ ተሳታፊዎች ምንም አይነት ዝርዝር መረጃ አይገልጽም። ስማቸው እንዳይገለጽ ለማረጋገጥ መጠይቆቹ ኮድ ይደረጋሉ እና የተሳታፊዎችን ስም አያካትቱም።

7. **ትክክል**፡ በዚህ ጥናት ውስጥ መሳተፍ ሙሉ በሙሉ በፈቃደኝነት ነው። በዚህ ጥናት ውስጥ ለመሳተፍ ወይም ላለመቀበል መብታችሁ የተጠበቀ ነው። በተጨማሪም፣ በመረጃ አሰባሰብ ሂደት ውስጥ ምቾት የሚፈጥር ማንኛውንም ጥያቄ የመመለስ ግዴታ የለብህም።

8 **የእድራሻ አድራሻ፡-** በማንኛውም ጊዜ ስለ ጥናቱ ወይም አሰራሮቹ ማንኛውም አይነት ጥያቄ ወይም ተጨማሪ መረጃ ከፈለጉ እባክዎን ወደ ዋናው መርማሪ በረከትአብ ነጋ ጋር ለመገናኘት ነፃነት ይሰማዎ። በሚከተሉት ስልክ ቁጥሮች 251912043358 ወይም በኢሜል bereketaben@gmail.com ማግኘት ይቻላል። በተጨማሪም ይህንን ጥናት የሚከታተለውን የተቋማዊ ጤና ጥናትና ምርምር ስነምግባር ገምጋሚ ኮሚቴ በቢሮ ስልክ ቁጥር 0254662011 ወይም በፖስታ በፖስታ በፖ.ቦክስ 235, Harar, Ethiopia ማግኘት ይችላሉ.

9 በመረጃ ላይ የተመሰረተ የፈቃደኝነት ስምምነት መግለጫ

የአሳታፊውን የመረጃ ሉህ በሚገባ ከገመገምኩ በኋላ፣ የጥናቱ ዓላማዎች፣ የተካተቱት ሂደቶች፣ ሊኖሩ ስለሚችሉት አደጋዎች እና ጥቅሞች፣ ሚስጥራዊ ጉዳዮች እና የተሳታፊዎችን መብቶች ግልጽ ግንዛቤ አግኝቻለሁ። በማናቸውም እርግጠኛ ባልሆኑ ጉዳዮች ላይ ማብራሪያ እንድፈልግ ሰፊ እድል ተሰጥቶኛል። በማንኛውም ጊዜ ከጥናቱ የመውጣት መብቴ የተጠበቀ መሆኑን አውቃለሁ። ስለሆነም፣ ከዚህ በታች በተሰጠው የመጀመሪያ ፊርማ (ፊርማ) እንደተረጋገጠው ይህ ጥናት እንዲቀጥል ስሜና ፊርማዬ ፈቃዴን ሰጥቻለሁ።

የጥናቱ ተሳታፊ ስም እና ፊርማ፡- __ _ _____ቀን_____

የጥናቱ መረጃ ሰብሳቢ ስም እና ፊርማ__ _____ ቀን_____

8.5 Participant Information Sheet and a voluntary information form (age <18 years) / legally qualified adult representative of the vulnerable person (eg parent/legal guardian (Amharic version)

1. መግቢያ፡-የኔ ስም (_____)። በዚህ ማህበረሰብ ውስጥ እየተካሄደ ላለው ጥናት በአቶ በረከትአብ ነጋ በሃሮማያ ዩኒቨርሲቲ፣ በጤና እና ህክምና ሳይንስ ኮሌጅ ሁለተኛ ዲግሪያቸውን በመማር ላይ ላለው ጥናት መረጃ ሰብሳቢ ሆኜ እየሰራሁ ነው። ልጅዎ በዚህ ጥናት ውስጥ እንዲሳተፍ በዘፈቀደ ተመርጧል። ስለ ጥናቱ እና የልጁ ተሳትፎ ለእርስዎ ለማስረዳት ትኩረትዎን እንዲሰጡኝ በአክብሮት እጠይቃለሁ።

2. የጥናቱ/የፕሮጀክቱ ርዕስ፡- ከ6-23 ወራት እድሜ ክልል ውስጥ የሚገኙ ህጻናት ዝቅተኛ የምግብ ድግግሞሽ እና ተያያዥ ምክንያቶች በምስራቅ ኢትዮጵያ በሐረር ከተማ በሐረሪ ክልል በሚገኙ ጤና ጣቢያዎች

3. የጥናቱ ዓላማ/ዓላማ፡-የዚህ ጥናት ውጤት ለሐረሪ ክልል ጤና ቢሮ የጣልቃገብነት መርሃ ግብሮችን በመንደፍ ከፍተኛ ጠቀሜታ አለው። እነዚህ መርሃ ግብሮች በማህበረሰቡ ውስጥ እና ከዚያም በላይ ባለው አነስተኛ የምግብ ድግግሞሽ ጉዳዮች ላይ ግንዛቤን ለማጎልበት እና የጨቅላ እና ትንንሽ ህጻናትን የመመገብ ልምምድ አጠቃላይ ግንዛቤን ለማሻሻል ነው። በተጨማሪም የዚህ ጥናት ዋና ዓላማ በሕዝብ ጤና የተመጣጠነ ምግብ ውስጥ ለማስተርስ ዲግሪ የሚያስፈልጉትን ነገሮች በከፊል የሚያሟላ ለቲሲስ ማበርከት ነው።

4. ሂደት እና የቆይታ ጊዜ፡-ወደ ጤና ጣቢያው በሚጎበኙበት ወቅት መረጃ ሰብሳቢዎች ከእናቶች ወይም ተንከባካቢዎች ጋር ቃለ መጠይቅ ያደርጋሉ። ለጥናቱ አስፈላጊ መረጃዎችን ለመሰብሰብ መጠይቁን ይጠቀማሉ። ቃለመጠይቆቹ ከ20 እስከ 40 ደቂቃዎች እንደሚቆዩ ይጠበቃል። በስድስት ክፍሎች 87 ጥያቄዎች ይኖሩታል. ይህ ሂደት ለጥናታችን አጠቃላይ እና ጠቃሚ መረጃዎችን እንደምንሰበስብ ያረጋግጣል።

5. አደጋዎች እና ጥቅሞች:ጥናቱ በተሳታፊዎች ላይ አነስተኛ አደጋዎችን ይፈጥራል, እና አነስተኛ ምቾት ለመሳተፍ የሚያስፈልገው አጭር ጊዜ ነው. ይህ ጥናት ምንም አይነት የገንዘብ ሽልማቶችን ባይሰጥም፣ ከጥናቱ የተገኙ ግንዛቤዎች ለአካባቢያዊ የጤና እቅድ ውጥኖች ጠቃሚ መረጃ ሊሰጡ ይችላሉ።

6. ሚስጥራዊነት፡- በተሳታፊዎች የቀረበው መረጃ በከፍተኛ ሚስጥራዊነት ይታከማል። አንድን ግለሰብ ሊለይ የሚችል ምንም አይነት መረጃ አልተሰበሰበም። የጥናቱ ውጤት አጠቃላይ ይሆናል እና ስለ ግለሰብ ተሳታፊዎች ምንም አይነት ዝርዝር መረጃ አይገልጽም። ስማቸው እንዳይገለጽ ለማረጋገጥ መጠይቆቹ ኮድ ይደረጋሉ እና የተሳታፊዎችን ስም አያካትቱም።

7. መብቶች፡- የዚህ ጥናት ተሳትፎ ሙሉ በሙሉ በፈቃደኝነት ነው። በዚህ ጥናት ለመሳተፍም ሆነ ላለመሳተፍ የማወጅ መብት አልዎት። ለመሳተፍ ከወሰኑ በማንኛውም ጊዜ ከጥናቱ የመውጣት መብት አልዎት እና ይህ እርስዎ ያለዎትን ማንኛውንም የጥቅማጥቅም ማጣት ምልክት አያደርግልዎትም. መመለስ የማትፈልገውን ማንኛውንም ጥያቄ መመለስ የለብህም።

8. የአድራሻ አድራሻ፡- በማንኛውም ጊዜ ስለ ጥናቱ ወይም አሰራሩ ተጨማሪ መረጃ ከፈለጉ፣ እባክዎን ዋና መርማሪውን አቶ በረከትበ ነጋን ለማነጋገር ነፃነት ይሰማዎ። በሚከተሉት ስልክ ቁጥሮች +251912043358 ወይም በኢሜል በ bereketaben@gmail.com ማግኘት ይቻላል። በተጨማሪም ይህንን ጥናት የሚከታተለውን የተቋማዊ ጤና ጥናትና ምርምር ስነምግባር ገምጋሚ ኮሚቴ (IHRERC) በቢሮ ስልክ ቁጥር 0254662011 ወይም በፖስታ በፖስታ በፖ.ቦክስ 235, Harar, Ethiopia ማግኘት ይችላሉ.

9. በመረጃ ላይ የተመሰረተ የፈቃደኝነት ስምምነት መግለጫ፡-

የተሳታፊውን የመረጃ ወረቀት አንብቤአለሁ/ አንብቤያለሁ። የጥናቱን አላማ፣ አካሄዶችን፣ ስጋቶችን እና ጥቅሞችን፣ ሚስጥራዊ ጉዳዮችን፣ የመሳተፍ መብቶችን እና ለማንኛውም መጠይቆች አድራሻውን በግልፅ ተረድቻለሁ። ግልጽ ባልሆኑ ጉዳዮች ላይ ጥያቄዎችን እንድጠይቅ እድል ተሰጥቶኛል። ልጄን በማንኛውም ጊዜ ከጥናቱ የማውጣት ወይም የማልፈልገውን ማንኛውንም ጥያቄ ላለመመለስ መብት እንዳለኝ ተነገረኝ። ስለዚህ፣ ልጄ በዚህ ጥናት የመጀመሪያ ሆሄያት (ፊርማ) እንዲሳተፍ (እንዲሳተፍ) ለመፍቀድ በፈቃደኝነት መስማማቴን አውጃለሁ።

☐

የተሣታፊው ስም፡- _____ (ከ12-17 ዓመት ያልሞላው ዕድሜ ከሆነ የተረጋገጠ ስምምነት)

የወላጅ/ህጋዊ አሳዳጊ ስም እና ፊርማ፡- _____ _____ ቀን፡ _____

የውሂብ ሰብሳቢው ስም እና ፊርማ፡_____ ቀን፡ _____

ኤን.ቢ

• ይህ መረጃ ሰብሳቢው ባሉበት ፊት ለፊት ተፈርሟል።

• እባክዎ የዚህን የተፈረመ ስምምነት ቅጂ ለተሳታፊው ህጋዊ ተወካይ ያቅርቡ።

• ተወካዩ (ወላጅ/አሳዳጊ) ተራ ሰው ከሆኑ እና የመጀመሪያ ፊደሎችን መፈረም የማይችሉ ከሆነ የአውራ ጣት አሻራውን ብቃት ባለው ምስክር ፊት ማድረግ ይችላል። እና ምስክሩ አብሮ መፈረም አለበት (ስሙን እና አድራሻውን የያዘ)።
• ተሳታፊው ከ12-17 አመት እድሜ ክልል ውስጥ ከሆነ፣ በወላጅ/አሳዳጊ ስምምነት ላይ ለአካለ መጠን ላልደረሰው ልጅ ፈቃድ (በቃል ወይም በጽሁፍ) ሊጠየቅ ይችላል።

8.6 Participant Information Sheet and Informed Voluntary Consent Form for mothers or caregivers attending health center (Afan Oromo version)

(age>=18 years)

1.Seensa: Maqaan koo _____ jedhama qorannoo buufata fayyaa Bereketaab Negaa kana keessatti gaggeeffamaa jiruuf daataa walitti qabaa ta'ee hojjechaa jira. Qorannichaa fi akka hirmaataa qorannootti filannoo keessan akka ibsitan xiyyeeffannoo keessan kabajaan gaafadha.

2. Mata duree qorannichaa: Baha Itiyoophiyaa buufataalee fayyaa magaalaa Harer keessatti daa'imman umuriin isaanii ji'a 6-23 ta'an irratti baay'inni nyaataa gadi aanaa fi wantoota kanaan walqabatan.

3. Kaayyoo/Kaayyoo qorannichaa: Bu'aan qorannoo kanaa sagantaalee gidduu seensaa dizaayinii gochuu keessatti waajjira fayyaa naannichaaf barbaachisummaa guddaa qaba. Bu'aan qorannoo kanaa sagantaalee gidduu seensaa dizaayinii gochuu keessatti waajjira fayyaa naannichaaf iddoo guddaa qaba. Sagantaawwan kunniin dhimmoota nyaata gadi aanaa hawaasaa fi sanaa ol ta'an irratti hubannoo uumuu, akkasumas hubannoo waliigalaa gochaalee nyaata daa'immanii fi daa'imman xixiqqoo fooyyessuuf kan kaayyeffatanidha. Kana malees, kaayyoon qorannoo kanaa inni guddaan barruu qorannoo (thesis) gartokkoon ulaagaalee digirii lammaffaa soorata fayyaa hawaasaatiin guutu gumaachuudha.

4. Hojimaataa fi yeroo: Walitti qabaan odeeffannoo yeroo buufata fayyaa daawwatan haadholii ykn kunuunsitoota gaaffii fi deebii taasisa. Odeeffannoo qorannichaaf barbaachisu walitti qabuuf gaaffilee ni fayyadamta. Namoonni odeeffannoo walitti qaban biroo af-gaaffii kanaan kan guutan yoo ta'u, kunis daqiiqaa 20 hanga 40 kan turu ta'a jedhamee eegama.

5. Balaa fi Faayidaa: Qorannoon kun hirmaattota irratti balaa tokkollee kan hin fidne yoo ta'u, hirmaachuuf yeroo gabaabaa qofatu barbaachisa. Qorannoon kun badhaasa maallaqaa tokkollee kan hin kennine ta'us, hubannoon qorannicha irraa argame jalqabbii karoora fayyaa naannoodhaaf odeeffannoo gatii guddaa qabu kennuu danda'a.

6. Iccitii: Odeeffannoon hirmaattonni kennan iccitii guddaa ta'een ni ilaalama. Odeeffannoon dhuunfaa adda baasu tokkollee hin sassaabamu. Bu'aan qorannichaa waliigalaa kan ta'u yoo ta'u, waa'ee hirmaattota dhuunfaa odeeffannoo bal'aa kan hin ibsine ta'a. Gaaffiiwwan kunneen maqaan isaanii akka hin dhahamneef koodii kan kennan yoo ta'u, maqaa hirmaattotaa kan hin dabalanne ta'a.

7. Sirrii: Qo'annoo kana irratti hirmaachuun guutummaatti fedhii ofiitiin kan raawwatamudha. Qo'annoo kana irratti hirmaachuu fi dhiisuuf mirga qabda. Kana malees, adeemsa odeeffannoo walitti qabuu keessatti gaaffiiwwan rakkina uumuu danda'an kamiyyuu deebisuuf dirqama hin qabdu.

8. Teessoo Quunnamtii: Yeroo kamiyyuu waa'ee qorannichaa ykn adeemsa isaa gaaffii yoo qabaattan ykn odeeffannoo dabalataa yoo barbaaddan, qorataa ijoo, Bereket Ab Nega bilisaan qunnamaa. Lakkoofsa bilbilaa armaan gadii: 251912043358 ykn email bereketaben@gmail.com irratti qunnamuun ni danda'ama. Akkasumas koree gamaaggama naamusa qorannoo fayyaa dhaabbilee qorannoo kana to'atu lakkoofsa bilbila waajjira 0254662011 ykn poostaa PO Box 235, Harar, Ethiopia irratti qunnamuu dandeessu.

9. Ibsa hayyama beekumsa qabu

Waraqaa Odeeffannoo Hirmaattotaa gadi fageenyaan erga ilaalee booda, kaayyoo qorannichaa, hojimaata qorannichaa, balaa fi faayidaa dhufuu danda'u, dhimmoota iccitii, fi mirga hirmaattotaa irratti hubannoo ifa ta'e qaba. Qabxiilee mirkanaa'uu dhabuu kamiyyuu irratti ibsa akkan barbaadu carraan bal'aan naaf kennameera. Yeroo kamiyyuu qo'annoo keessaa ba'uuf mirga akkan qabu nan hubadha. Kanaafuu, qorannoo kana akka itti fufuuf hayyama maqaa fi mallattoo koo nan kenna akka ragaan mallattoo koo isa jalqabaa armaan gadii irraa mul'atutti.

Maqaa fi mallattoo hirmaataa qorannichaa:- _____guyyaa _____

Maqaa fi mallattoo walitti qabaa odeeffannoo qorannichaa:- _____guyyaa_____

8.7 Participant Information Sheet and Informed Voluntary Consent Form for parents/guardinans of Minors (age < 18 years)(Afan Oromo Version)

1. Seensa: 1.1. Maqaan koo (_____). Qo'annoo hawaasa kana keessatti gaggeeffamaa jiruuf Daataa walitti qabaa ta'ee hojjechaa jira Bereketabe Nega Yunivarsiitii Haramayaa, Kolleejjii Saayinsii Fayyaa fi Meedikaalaa keessatti Digrii Mastersii isaaf barachaa jira. Mucaan keessan qorannoo kana irratti hirmaataa akka ta'uuf akka tasaa filatama. Waa'ee qorannichaa fi hirmaannaa daa'imaa akka isiniif ibsuuf xiyyeeffannoo keessan akka naaf liqeessitan kabajaan isin gaafadha.

2. **Mata duree qorannichaa/pirojektichaa**: Irra deddeebiin Nyaata Xiqqaa fi wantoota kanaan walqabatan Daa'imman Umriin Ji'oota 6-23 Buufata Fayyaa Baha Itiyoophiyaa Godina Hararii magaalaa Harar keessatti argaman biratti

3. Kaayyoo/kaayyoo qorannichaa: Bu'aan qorannoo kanaa sagantaalee gidduu seensaa qopheessuu keessatti biiroo fayyaa naannoo Hararriif gatii guddaa qaba. Sagantaawwan kunniin hawaasa keessaa fi sanaa ol gidduutti dhimmoota irra deddeebiin nyaata xiqqaa ta'een walqabatan irratti hubannoo guddisuu kan kaayyeffatan yoo ta'u, kanaanis hubannoo waliigalaa shaakala nyaata daa'immanii fi daa'imman xixiqqoo fooyyessuudha . Kana malees, kaayyoon qorannoo kanaa inni guddaan barruu qorannoo (thesis) tokkoof gumaachuudha, kunis gartokkoon ulaagaalee digrii Mastersii Nyaata Fayyaa Hawaasaatiin guutuudha.

4. Hojimaata fi yeroo: Yeroo daawwannaa buufata fayyaa kanaatti, namoonni odeeffannoo walitti qaban haadholii ykn kunuunsitoota waliin af-gaaffii ni gaggeessu. Qorannichaaf ragaa barbaachisaa ta'e walitti qabuuf gaaffilee fayyadamu. Af-gaaffiin kun daqiiqaa 20 hanga 40 gidduutti akka turu eegama. Gaaffilee 87 kutaa jahaan qabaata. Adeemsi kun qorannoo keenyaaf ragaa bal'aa fi gatii guddaa qabu akka walitti qabnu taasisa.

5. Balaa fi faayidaa: Qorannoon kun hirmaattootaaf balaa xiqqaa kan fidu yoo ta'u, rakkoon xiqqaan immoo yeroo gabaabaa hirmaannaaf barbaachisu ta'uu isaati. Qorannoon kun badhaasa maallaqaa tokkollee kan hin kennine ta'us, hubannoon qorannoo kana irraa argame jalqabbii karoora fayyaa naannoodhaaf odeeffannoo gatii guddaa qabu kennuu danda'a

6. Iccitii: Daataan hirmaattonni kennan iccitii olaanaa ta'een kan ilaalamu ta'a. Odeeffannoon adda baafamuu danda'u kan hirmaataa dhuunfaa adda baasuu danda'u walitti qabame hin jiru. Bu'aan qorannichaa waliigala ta'ee waa'ee hirmaattota dhuunfaa ibsa addaa kan hin ibsine ta'a. Maqaan akka hin dhahamne mirkaneessuuf gaaffileen koodii kan kennan yoo ta'u, maqaa hirmaattotaa kan hin hammanne ta'a.

7. Mirgoota: Qorannoon kanaaf hirmaannaan guutummaatti fedhii ofiitiin kan raawwatamudha. Qo'annoo kana irratti hirmaachuu fi dhiisuu kee labsuuf mirga qabda. Yoo hirmaachuuf murteessite yeroo barbaaddetti qorannicha keessaa ba'uuf mirga qabda kunis faayidaa kasaaraa karaa biraatiin siif malu kamiyyuu si hin mallatu. Gaaffii deebii kennuu hin barbaanne kamiyyuu deebisuun si hin barbaachisu.

8. Teessoo quunnamtii: Yeroo kamiyyuu gaaffii yoo qabaattan ykn waa'ee qorannichaa ykn hojimaata isaa odeeffannoo dabalataa yoo barbaaddan, maaloo bilisaan Qorataa Muummee, Bereletabe Nega qunnamaa. Lakkoofsa bilbilaa armaan gadiitiin: +251912043358, ykn karaa email bereketaben@gmail.com qunnamuun ni danda'ama. Dabalataanis, Koree Gamaaggama Naamusa Qorannoo Fayyaa Dhaabbilee (IHRERC), qorannoo kana to'achuuf itti gaafatamummaa qabu, lakkoofsa bilbila waajjira isaanii 0254662011 ykn karaa poostaa P.O.Box 235, Harar, Ethiopia qunnamuu ni dandeessu.

9. Ibsa hayyama tola ooltummaa beekumsa qabu:

Waraqaa odeeffannoo hirmaattotaa dubbiseera/ naaf dubbifameera. Kaayyoo qorannichaa, hojimaata, balaa fi faayidaa, dhimmoota iccitii, mirga hirmaachuu fi teessoo quunnamtii gaaffii

kamiyyuu sirriitti hubadheera. Wantoota ifa hin taane ta'uu danda'aniif gaaffii akkan gaafadhu carraan naaf kennameera. Yeroo barbaadetti mucaa koo qo'annoo keessaa baasuu ykn gaaffii ani hin barbaanne kamiyyuu deebisuuf mirga akkan qabu naaf himameera. Kanaafuu, daa'imni koo qorannoo kana irratti akka hirmaatu (hirmaatu) akka hayyamuuf hayyama fedhii kootiin qubee jalqabaa (mallattoo) kootiin nan ibsa.

Maqaa hirmaataa: _____ (Eeyyamni kan mirkanaa'e yoo umuriin isaa xiqqaa waggaa 12-17 ta'e)
Maqaa fi mallattoo warraa/guddistuu seeraa: _____ _____
Guyyaa: _____ .
Maqaa fi mallattoo Walitti qabaa
Odeeffannoo:_____ Guyyaa: _____ .
N.B
• Kunis bakka walitti qabaan daataa jirutti fuula fuulatti mallattaa'a.
• Maaloo waraabbii hayyama mallattaa'e kanaa bakka bu'aa seeraa hirmaataaf kenni.
• Bakka bu'aan (warri/guddistuu) nama laayyoo ta'ee fi qubee jalqabaa mallatteessuu kan hin dandeenye yoo ta'e, ragaa gahumsa qabu fuulduratti qubbee harkaa isaa kaa'uu kan danda'u yoo ta'e; akkasumas ragaan cinatti (maqaa fi teessoo isaa waliin) mallatteessuu qaba.
• Hirmaataan umuriin isaa waggaa 12-17 yoo ta'e, hayyama warraa/guddistuu irratti daa'ima umriin isaa hin geenye irraas hayyamni (afaan ykn barreeffamaan) barbaachisuu danda'a.

8.8 English version Questionnaires

Title: Minimum Meal Frequency and associated factors among Children Aged 6-23 Months Attending Health Centers in Harar city, Harari Region, Eastern Ethiopia, 2024

General information and identification

01. Participant code
02. Date of data collection ____/_____/_____
03. Kebele ____
04. Household Code___

1. Socio demography

No	Question	Response	Skip /Remark
Q.101	Age of mother or caregiver?	_____years	
Q.102	Family size	_____	
Q.103	What is your current marital status?	1.Single 2.Married 3.Widowed 4.Divorced 5.Other	
Q.104	Number of under five children in the HH	_____	
Q.105	Religion	1.Orthodox 2.Muslim 3.Protestant 4.Catholic 4.Others(specify)	
Q.106	Ethnicity	1. Oromo 2.Amhara 3. Tigrai 4. Gurage 5.Others(specify)	
Q.1	What is your education level	1. unable to read and write	

07	(mother)?	2. primary school(1-8) 3.secondary school and above	
Q.108	Paternal educational level	1. unable to read and write	
		2. primary school(1-8) 3.secondary school and above	
Q.109	Occupation of mother	1. Housewife only	
		2. Farmer	
		3. Merchant/Trade	
		4 Private Organization employee	
		5. Government employee	
		6.Daily laborer 7.Other(specify)	
		2. Farmer	
		3. Merchant/Trade	
		4 Private Organization employee	
		5. Government employee	
		6.Daily laborer 7.Other(specify)	
Q.111	Child‘s sex	1. Male 2. Female	
Q.112	Child‘s age	_____Months	

2. Child characteristics

Q.201	Birth order	____th
Q.202	Place of delivery	1.Home 2.Health facility 3. Other(specify)_____
Q.203	Diarrhea disease in the past week?	1. Yes 2. No
Q.204	febrile disease in the past week	1. Yes 2. No
Q.205	other illness	1. Yes 2. No

3. health services utilization

Q.301	Did you visit health center before (ANC)	1.Yes2. No
Q.302	During your visit did you get health education about child feeding practice and MMF	1. Yes
		2. No
Q.303	Did you visit health facility for PNC?	1. Yes 2 No
Q.304	If yes for Q above Number of PNC visits	

4. Questions to assess MMF

Q.401	Is your child currently breastfed?	1. Yes 2. No	If the answer is NO eskip to question no.
Q402	How many times was the child breastfed in the past 24 hours?	_____	
Q403	If the child is breastfed, How many times did the child eat solid, semi-solid, or soft foods in the past 24 hours (excluding breast milk)?	1. One times 2. Two times 3. Three times 4. Four or more than four times	
Q.405	NON Breastfed children 6-23 month		
Q.406	For non breastfed, How many times did the child eat solid, semi-solid, or soft foods in the past 24 hours		
Q.407	Does your child drink infant formula for the past 24 hrs	1. Yes 2. No	
Q.408	If Yes for the Q 407, how many times	1. One times 2. Two times 3. Three times 4. Four or more	
Q.409	Does your child drink Animal milk (fresh milk, tinned milk or powderd milk) for the past 24 hour	1. Yes 2. No	
Q.410	If Yes for the Q.409, how many times	1. One times 2. Two times 3. Three times 4. Four or more	

Q.411	Does your children drink Yoghurt for the past 24 hour	1. Yes 2. No	
Q.412	If Yes for the Q.411, how many times	1. One times 2. Two times 3. Three times 4. Four or more	

5. **Questions to assess house hold food security condition (HFAIS)**

Q.501	In the past four weeks, did you worry that your household would not have enough food?	1.Yes 2.No	IfNo,skip Q to 502
Q.501a	How often did this happen?	.rarely(1x/2xinthepastfour weeks) 2.sometimes(3xto10x) 3.often(>10x**)**	
Q.502	In the past four weeks, were you or and any house hold member not able to eat the kinds of food you preferred because of alackof resource?	1. Yes 2. No	IfNo,skip to Q503
Q.502a	How often did this happen?	.rarely(1x/2xinthepastfour weeks) 2.sometimes(3xto10x) 3.often(>10x)	
Q.503	In the past four weeks,did you or any house Hold member have to eat alimited variety of foods due to a lack of resources?	1. Yes 2. No	IfNo,skip Q to 504
Q.503a	How often did this happen?	rarely(1x/2xinthepastfour weeks) 2.sometimes(3xto10x) 3.often(>10x	

Q.504	In the past four weeks, did you or any house hold member have to eat some foods that you really did not want to eat because of a lackof Resources to obtain other types of food?	1. Yes 2. No	IfNo,skip Q to 505
Q.505	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	.Yes 2.No	IfNo,skip Q to 506
Q.505a	How often did this happen?	1.rarely(1x/2xinthepastfour weeks)	
		2.sometimes(3xto 10x) 3.often(>10x	
Q.506	In the past four weeks did you or any household member have to eat fewer meals in a day because there was not enough food?	1.Yes 2.No	IfNo,skipto Q 507
Q.506a	How often did this happen?	.rarely(1x/2xinthepastfour weeks) 2.sometimes(3xto10x) 3.often(>10x	
Q.507	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resource to get food?	.Yes 2.No	Ifno,skiptoQ 508
Q.507a	How often did this happen?	.rarely(1x/2xinthepastfour weeks) 2.sometimes(3xto10x) 3.often(>10x	
Q.508	In the past four weeks,did you or any Household member go to sleep at night hungry because there was not enough food?	.Yes 2.No	IfNoskipQ 509
Q.508a	How often did this happen?	.rarely(1x/2xinthepastfour weeks) 2. sometimes(3xto10x) 3.often(>10x	

Q.509	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not Enough food?	. Yes 2.No	
Q.509a	How often did this happen?	rarely(1x/2xinthepastfour weeks) 2 sometimes(3xto10x) 3often(>10x	

6.Environmental Condition

Q.601	What is your main source of drinking water?	1 water well 2 Public pipe 3 Jar packed water and bottled packed water
Q.602	Do you treat your drinking water?	1.Yes2.No
	Do you wash your hands before feeding your child?	2.
Q.603	How do you dispose wastes?	1. Openfielddisposal.2.Inapit 3.Other (specify)
Q. 604	Do you have toilet	1 yes no

7. Maternal Knowledge of MMF

	Question	Answer
Q701	what do you know about the recommended number of meals per day for a breastfed child aged 6-8 months?	1.one meal 2. two meal 3. three meal 4. four meal
Q702	what do you know about the recommended number of meals per day for a breastfed child aged 9-23 months	1.one meal 2. two meal 3. three meal 4. four meal
Q703	what do you know about the recommended number of meals per day for a non breastfed child aged 6-23 months?	1.one meal 2. two meal 3. three meal 4. four meal

8. Assesment of Dietary Diversity

	Food Group	Examples	Consumed? (Yes/No)
Q701	breast milk		
Q702	Grains, roots, and tubers	Bread, rice, pasta, porridge, potatoes, maize,	
Q703	Legumes and nuts	Beans, peas, lentils, nuts, seeds	
Q704	Dairy products	Milk, cheese, yogurt	
Q705	Flesh foods (meat, poultry, fish)	Beef, chicken, fish, liver, organ meats	
Q706	Eggs	Any egg preparations (boiled, fried, scrambled)	
Q707	Vitamin-A rich fruits and vegetables	Pumpkin, carrots, squash, orange-fleshed sweet potatoes, dark leafy greens	
Q708	Other fruits and vegetables	Any fruits and vegetables not listed above, such as bananas, apples, cabbage, lettuce	

9. Assesment of Wealth status

Q113 N.	**Asset type**	**Response**		N.	**Asset type**	**Response**			
1	Electricity	1.Yes	2.No	15	Cart	1.Yes	2.No		
2	Television	1.Yes	2.No	16	Table	1.Yes	2.No		
3	Radio	1.Yes	2.No	17	Chair	1.Yes	2.No		
4	Fixed	1.Yes	2.No	18	Sofa	1.Yes	2.No		
5	telephone			19	agricultural land	1 yes	2 no		
6	Mobile phone	1.Yes	2.No	20	livestocks	1.Yes	2.No		
7	Computer	1.Yes	2.No	21	Own living house	1.Yes	2.No		
8	Refrigerator	1.Yes	2.No	22	Electric mitad	1.Yes	2.No		
9	Watch/clock	1.Yes	2.No	**Housing characteristics**					
10	Car	1.Yes	2.No	23	Type of floor	1.Mude	2.Ceme	3.Ceramic	4.Other
11	Bajaj	1.Yes	2.No	24	Type of roof	1.Grass	2.Corrugated iron	3.Tiles	4.Othe r
12	Motor cycle	1.Yes	2.No	25	Type of wall	1.Wood and mud	2.Ceme nt and blocks	3.Brick s	4.Othe r

9. Health Beilf Model construct

Questions on HBM constructs (please make "X" mark on the correct response		Strongly disagree=1	Disagree=2	Neutral=3	Agree=4	Strongly agree=5
Perceived Susceptibility	1. I believe my child is at risk of not getting enough nutrition.					
	2. I think my child is more likely to experience health problems due to poor nutrition compared to other children.					
	3. I worry that my child may not be getting the nutrients they need for healthy growth.					
Perceived Severity	1. I believe that malnutrition can lead to serious health problems for my child.					
	2. I think that if my child does not receive proper nutrition, it could affect their development.					
	3. I believe that malnutrition can lead to long-term health issues for my child.					
Perceived Benefits	1. Providing my child with nutritious meals will improve their overall health.					
	2. I believe that ensuring my child eats a balanced diet will help them perform better in school.					

	3. I think that proper nutrition can prevent illnesses in my child.					
Perceived Barriers	1. I find it difficult to afford healthy food for my child.					
	2. I believe that preparing nutritious meals takes too much time.					
	3. I feel that I lack the knowledge to prepare healthy meals for my child.					
	4. I think that my family prefers unhealthy foods over nutritious options.					
Cues to Action	1. I have received advice from healthcare professionals about my child's nutrition.					
	2. I have seen educational materials (e.g., brochures, posters) about healthy eating for children.					
	3. I participate in community programs that promote healthy eating for children.					
Self-Efficacy	1. I feel confident in my ability to provide nutritious meals for my child.					

	2. I believe I can overcome barriers to providing healthy food for my child.					
	3. I am capable of making healthy food choices for my family.					

8.9 Amharic version Questionnaires

ከ6-23 ወራት እድሜ ክልል ውስጥ የሚገኙ ህጻናት አነስተኛ የምግብ ድግግሞሽ እና ተያያዥ ምክንያቶች በምስራቅ ኢትዮጵያ ሀረር ከተማ በሐረር ከተማ ጤና ጣቢያዎች

አጠቃላይ መረጃ እና መታወቂያ

01. . የተሳታፊ ኮድ / መታወቂያ___

02. መረጃ የሚሰበሰብበት ቀን //

03. ቀበሌ _____

04. የቤተሰብ ኮድ___

1. Socio demography

No	የጥያቄ	የጥያቄ ምላሽ	ዝለል/አስተያየት።
Q.101	የእናት ወይም የአሳዳጊ ዕድሜ?	_____ ዓመት	
Q.102	የቤተሰብ መጠን	_____	
Q.103	አሁን ያለሽበት የትዳር ሁኔታ ምን ያህል ነው?	1.ነጠላ 2.ያገባ 3.መበለት 4.የተፋታ 5.ሌላ	
Q.104	በHH ውስጥ ከአምስት በታች ያሉ ህጻናት ብዛት	_____	
Q.105	ሃይማኖት	1.አርቶዶክስ 2.ሙስሊም 3.ፕሮቴስታንት 4.ካቶሊክ 4.ሌሎች(ይጥቀሱ)	
Q.106	ብሄር	1. ኦሮሞ 2.አማራ 3. ትግራይ 4. ጉራጌ 5.ሌሎች(ይጥቀሱ)	
Q.107	የትምህርት ደረጃ (እናት) ስንት ነው?	1. ማንበብ እና መጻፍ አለመቻል 2. የመጀመሪያ ደረጃ ትምህርት ቤት (1-8) 3. ሁለተኛ ደረጃ እና ከዚያ በላይ	

Q.108	የአባት የትምህርት ደረጃ	1. ማንበብ እና መጻፍ አለመቻል	
		2. የመጀመሪያ ደረጃ ትምህርት ቤት (1-8) 3. ሁለተኛ ደረጃ እና ከዚያ በላይ	
Q.109	የእናት ሥራ	1. የቤት እመቤት ብቻ	
		2. ገበሬ	
		3. ነጋዴ / ንግድ	
		4 የግል ድርጅት ሰራተኛ	
		5. የመንግስት ሰራተኛ	
		6.የእለት ሰራተኛ 7.ሌላ(ይግለጹ)	
		2. ገበሬ	
		3. ነጋዴ / ንግድ	
		4 የግል ድርጅት ሰራተኛ	
		5. የመንግስት ሰራተኛ	
		6.የእለት ሰራተኛ 7.ሌላ(ይግለጹ)	
Q.111	የልጁ ጾታ	1. ወንድ 2. ሴት	
Q.112	የልጁ ዕድሜ	_____ወሮች	

2. Child characteristics

Q.201	የልደት ቅደም ተከተል	____ ኛ
Q.202	የውልደት ቦታ	1.ቤት 2.የጤና ተቋም 3.ሌላ (ይግለጹ)_____
Q.203	ባለፈው ሳምንት ውስጥ የተቅማጥ በሽታ?	1. አዎ 2. የለም
Q.204	ባለፈው ሳምንት ውስጥ የትኩሳት በሽታ	1. አዎ 2. የለም
Q.205	ሌላ በሽታ	1. አዎ 2. የለም

3. health services utilization

Q.301	ከዚህ በፊት (ANC) ጤና ጣቢያን ጎበኘህ	1.አዎ2. አይ
Q.302	በጉበኝትዎ ወቅት ስለ ልጅ አመጋገብ ልምምድ እና ስለ ኤምኤምኤፍ የጤና ትምህርት አግኝተዋል	1.አዎ2. አይ

Q.303	ለፒኤንሲ የጤና ተቋምን ጎብኝተዋል?	1.አዎ2. አይ
Q.304	ከላይ ላለው Q አዎ ከሆነ የPNC ጉብኝቶች ብዛት	

4. Feeding practice and MMF

Q.401	ልጅዎ በአሁኑ ጊዜ ጡት ያጠባል?	1. አዎ 2. አይደለም	If the answee is NO eskip to question no.
Q402	ህጻኑ ባለፉት 24 ሰአታት ውስጥ ስንት ጊዜ ጡት ጠብቶ ነበር?	_____	
Q403	ህጻኑ ጡት ከተጠባ, ህጻኑ ባለፉት 24 ሰዓታት ውስጥ (ከጡት ወተት በስተቀር) ጠንካራ, ከፊል-ጠንካራ ወይም ለስላሳ ምግቦችን ስንት ጊዜ በልቷል?	1. አንድ ጊዜ 2. ሁለት ጊዜ 3. ሶስት ጊዜ 4. ከአራት ወይም ከአራት ጊዜ በላይ	
Q404	ባለፉት 24 ሰዓታት ውስጥ ልጅዎ ከሚከተሉት ምግቦች አንዱን ተቀብሏል? (የሚመለከተውን ሁሉ ይምረጡ)	[] ጥራጥሬዎች (ለምሳሌ፣ ገንፎ፣ ሩዝ) [] አትክልቶች [] ፍራፍሬዎች ሥጋ ወይም ዓሳ [] እንቁላል [] ጥራጥሬዎች (ለምሳሌ ባቄላ፣ ምስር) [] የወተት ተዋጽኦዎች (ለምሳሌ፣ እርጎ፣ አይብ)	
Q.405	ከ6-23 ወር ያሉ ጡት ያልጠቡ ልጆች		
Q.406	ጡት ላልታጠቡ ፣ ህፃኑ ባለፉት 24 ሰዓታት ውስጥ ስንት ጊዜ ጠንካራ ፣ ከፊል-ጠንካራ ወይም ለስላሳ ምግቦችን በልቷል ።		
Q.407	ልጅዎ ላለፉት 24 ሰአታት የጨቅላ ወተት ይጠጣል።	1. አዎ 2. አይደለም	
Q.408	ለጥያቄው አዎ ከሆነ ስንት ጊዜ	1. አንድ ጊዜ 2. ሁለት ጊዜ 3. ሶስት ጊዜ 4. አራት ወይም ከዚያ በላይ	
Q.409	ልጅዎ የእንስሳት ወተት ይጠጣል? (ትኩስ ወተት፣ የታሸገ ወተት ወይም ዱቄት ወተት) ላለፉት 24 ሰዓታት	1. አዎ 2. አይደለም	
Q.410	ለጥያቄው አዎ ከሆነ ስንት ጊዜ	1. አንድ ጊዜ 2. ሁለት ጊዜ 3. ሶስት ጊዜ 4. አራት ወይም ከዚያ በላይ	

Q.411	ልጆችዎ ላለፉት 24 ሰዓታት እርጎ ይጠጣሉ?	1. አዎ 2. አይደለም	
Q.412	ለጥያቄው አዎ ከሆነ ስንት ጊዜ	1. አንድ ጊዜ 2. ሁለት ጊዜ 3. ሶስት ጊዜ 4. አራት ወይም ከዚያ በላይ	

5. **Questions to assess house hold food security condition (HFAIS)**

Q.501	ባለፉት አራት ሳምንታት ውስጥ፣ የእርስዎ ቤተሰብ በቂ ምግብ አይኖረውም ብለው ተጨንቀው ነበር?	1.አዎ 2.አይ	IfNo,skip Q to 502
Q.501a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 አልፎ አልፎ (1x/2 ያለፈው አራት ሳምንታት) 2 አንዳንድ ጊዜ (3xto10x) 3 ብዙ ጊዜ (> 10x	
Q.502	ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ማንኛውም የቤት አባል በአልኮፍ ምክንያት የመረጡትን አይነት ምግብ መመገብ አልቻላችሁም ነበር. ሃብት?	1.አዎ 2.አይ	IfNo,skip to Q503
Q.502a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 አልፎ አልፎ (1x/2 ያለፈው አራት ሳምንታት) 2 አንዳንድ ጊዜ (3xto10x) 3 ብዙ ጊዜ (> 10x	
Q.503	ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም የትኛውም ቤት አደረጉ የያዙት አባል በሃብት እጦት የተገደበ የተለያዩ ምግቦችን መመገብ አለበት?	1.አዎ 2.አይ	IfNo,skip Q to 504
Q.503a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 አልፎ አልፎ (1x/2 ያለፈው አራት ሳምንታት) 2 አንዳንድ ጊዜ (3xto10x) 3 ብዙ ጊዜ (> 10x	

Q.504	ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ማንኛውም የቤት ውስጥ አባል በእጦት ምክንያት ለመመገብ የማይፈልጓቸውን አንዳንድ ምግቦች መብላት ነበረባችሁ ሌሎች የምግብ ዓይነቶችን ለማግኘት ሀብቶች?	1.አዎ 2.አይ	IfNo,skip Q to 505
Q.505	ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ማንኛውም የቤተሰብ አባል ስላልነበረ ከምትፈልጉት መጠን ያነሰ ምግብ መብላት ነበረባችሁ በቂ ምግብ?	1.አዎ 2.አይ	IfNo,skip Q to 506
Q.505a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 አልፎ አልፎ (1x/2 ያለፈው አራት ሳምንታት) 2 አንዳንድ ጊዜ (3xto10x) 3 ብዙ ጊዜ (> 10x	
Q.506	ባለፉት አራት ሳምንታት እርስዎ ወይም ማንኛውም የቤተሰብ አባል በ ሀ ውስጥ ጥቂት ምግቦችን መመገብ ነበረብዎት በቂ ምግብ ስላልነበረ ቀን?	1.አዎ 2.አይ	IfNo,skipto Q 507
Q.506a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 አልፎ አልፎ (1x/2 ያለፈው አራት ሳምንታት) 2 አንዳንድ ጊዜ (3xto10x) 3 ብዙ ጊዜ (> 10x	
Q.507	ባለፉት አራት ሳምንታት ውስጥ ምንም ምግብ አልነበረም ምግብ ለማግኘት የሚያስችል ሃብት በማጣት ምክንያት በቤተሰባችሁ ውስጥ ማንኛውንም ዓይነት ለመብላት?	1.አዎ 2.አይ	Ifno,skiptoQ 508
Q.507a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 አልፎ አልፎ (1x/2 ያለፈው አራት ሳምንታት) 2 አንዳንድ ጊዜ (3xto10x) 3 ብዙ ጊዜ (> 10x	
Q.508	በአለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም አንድም አድርገዋል በቂ ምግብ ስለሌለ የቤተሰብ አባል በረሃብ ይተኛል?	1.አዎ 2.አይ	IfNoskipQ 509

Q.508a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 አልፎ አልፎ (1x/2 ያለፈው አራት ሳምንታት) 2 አንዳንድ ጊዜ (3xto10x) 3 ብዙ ጊዜ (> 10x	
Q.509	ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ማንኛውም የቤተሰብ አባል ስለሌለ ምንም ነገር ሳትበሉ ሙሉ ቀንና ሌሊት ሄዱ በቂ ምግብ?	1.አዎ 2.አይ	
Q.509a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 አልፎ አልፎ (1x/2 ያለፈው አራት ሳምንታት) 2 አንዳንድ ጊዜ (3xto10x) 3 ብዙ ጊዜ (> 10x	

6.Environmental Conditions

Q.601	ዋናው የመጠጥ ውሃ ምንጭ ምንድን ነው?	1 የውሃ ጉድጓድ 2 የህዝብ ቧንቧ 3 ጃር የታሸገ ውሃ እና የታሸገ ውሃ
Q.602	የመጠጥ ውሃዎን ታከመዋል?	1.አዎ 2.አይ
	ልጅዎን ከመመገብዎ በፊት እጅዎን ይታጠቡ?	1.አዎ 2.አይ
Q.603	ቆሻሻዎችን እንዴት ማስወገድ እንደሚቻል?	2. 1. ክፍት ሜዳ ማስወገጃ.2.ኢፒት 3. ሌላ (ይግለጹ)
Q604	ሽንት ቤት አለሽ?	ነአዎ 2.አይ

7. Assesment of Dietary Diversity

	Food Group	Examples	Consumed? (Yes/No)
Q701	የጡት ወተት		
Q702	ጥራጥሬዎች, ሥሮች እና ቱቦዎች	ዳቦ, ሩዝ, ፓስታ, ገንፎ, ድንች, በቆሎ,	
Q703	ጥራጥሬዎች እና ፍሬዎች	ባቄላ፣ አተር፣ ምስር፣ ለውዝ፣ ዘር	
Q704	የወተት ምርቶች	ወተት, አይብ, እርጎ	
Q705	የስጋ ምግቦች (ስጋ, ዶሮ, ዓሳ)	የበሬ ሥጋ ፣ ዶሮ ፣ ዓሳ ፣ ጉበት ፣ የአካል ክፍሎች	
Q706	እንቁላል	ማንኛውም የእንቁላል ዝግጅት (የተቀቀለ ፣የተጠበሰ ፣የተቀጠቀጠ)	
Q707	በቫይታሚን ኤ የበለጸጉ ፍራፍሬዎችና አትክልቶች	ዱባ, ካሮት, ስኳሽ, ብርቱካንማ ሥጋ ስኳር ድንች, ጥቁር ቅጠል	
Q708	ሌሎች ፍራፍሬዎችና አትክልቶች	እንደ ሙዝ, ፖም, ጎመን, ሰላጣ የመሳሰሉ ከላይ ያልተዘረዘሩ አትክልቶች እና ፍራፍሬዎች	

8. Assesment of Wealth status

Q113 N.	**Asset type**	**Response**		N.	**Asset type**	**Response**			
1	ኤሌክትሪክ	1. አዎ	2.አይ	15	ጋሪ	. አዎ	2.አይ		
2	ቴሌቪዥን	1. አዎ	2.አይ	16	ጠረጴዛ	1. አዎ	2.አይ		
3	ሬዲዮ	1. አዎ	2.አይ	17	ወንበር	1. አዎ	2.አይ		
4	ቋሚ	1. አዎ	2.አይ	18	ሶፋ	1. አዎ	2.አይ		
5	ስልክ			19	የእርሻ መሬት	1 አዎ	2 ቁ		
6	ሞባይል ስልክ	1. አዎ	2.አይ	20	የእንስሳት እርባታ	1. አዎ	2.አይ		
7	ኮምፒውተር	1. አዎ	2.አይ	21	የራሱ የመኖሪያ ቤት	1. አዎ	2.አይ		
8	ማቀዝቀዣ	1. አዎ	2.አይ	22	የኤሌክትሪክ ሜትር	1.አዎ	2.አይ		
9	ሰዓት/ሰዓት	1. አዎ	2.አይ	**Housing characteristics**					
10	መኪና	1. አዎ	2.አይ	23	የወለል ዓይነት	1. ጭቃ	2.ሲሜ	3. ሴራሚክ	4.ሌላ
11	ባጃጅ	1.Yes	2.አይ	24	የጣሪያ ዓይነት	1. ሣር	2.የቆርቆሮ ብረት	3. ሰቆች	4.ሌላ አር

12	የሞተር ዕደት	1.Yes	2.አይ	25	የግድግዳ ዓይነት	1. እንጨት እና ጭቃ	2.Ceme nt እና ብሎኮች	3. ጡብ ኤስ	4.ሌላ አር

9. Health Beilf Model construct

Questions on HBM constructs (please make "X" mark on the correct response		Strongly disagree=1	Disagree=2	Neutral=3	Agree=4	Strongly agree=5
Perceived Susceptibility	1. ልጄ በቂ የተመጣጠነ ምግብ ባለማግኘት አደጋ ላይ እንደሚወድቅ አምናለሁ።					
	2. እኔ እንደማስበው ልጄ ከሌሎች ልጆች ጋር ሲነጻጸር በተመጣጠነ ምግብ እጥረት ምክንያት የጤና ችግሮች ሊያጋጥመው ይችላል.					
	3. ልጄ ለጤናማ እድገት የሚያስፈልጋቸውን ንጥረ ነገሮች ላያገኝ ይችላል ብዬ እጨነቃለሁ።					
Perceived Severity	1. የተመጣጠነ ምግብ እጥረት በልጄ ላይ ከባድ የጤና እክል እንደሚያመጣ አምናለሁ።					
	2. ልጄ ተገቢ አመጋገብ ካላገኘ በእድገታቸው ላይ ተጽእኖ ሊያሳድር ይችላል ብዬ አስባለሁ.					
	3. የተመጣጠነ ምግብ እጥረት ለልጄ የረዥም ጊዜ የጤና ጉዳዮችን እንደሚያመጣ አምናለሁ።					
Perceived Benefits	1. ለልጄ የተመጣጠነ ምግብ ማቅረብ አጠቃላይ ጤንነቱን ያሻሽላል።					

	2. ልጄ የተመጣጠነ ምግብ መመገቡን ማረጋገጥ በትምህርት ቤት የተሻለ ውጤት እንዲያመጣ ይረዳቸዋል ብዬ አምናለሁ።					
	3. እኔ እንደማስበው ትክክለኛ አመጋገብ በልጄ ላይ በሽታዎችን መከላከል ይችላል.					
Perceived Barriers	1. ለልጄ ጤናማ ምግብ መግዛት ይከብደኛል።					
	2. የተመጣጠነ ምግቦችን ማዘጋጀት ብዙ ጊዜ እንደሚወስድ አምናለሁ.					
	3. ለልጄ ጤናማ ምግቦችን የማዘጋጀት እውቀት እንደሌለኝ ይሰማኛል።					
	4. ቤተሰቤ ከተመጣጣኝ አማራጮች ይልቅ ጤናማ ያልሆኑ ምግቦችን የሚመርጥ ይመስለኛል።					
Cues to Action	1. የልጄን አመጋገብ በተመለከተ ከጤና አጠባበቅ ባለሙያዎች ምክር ተቀብያለሁ።					
	2. ለልጆች ጤናማ አመጋገብን በተመለከተ የትምህርት ቁሳቁሶችን (ለምሳሌ ብሮሹሮች፣ ፖስተሮች) አይቻለሁ።					
	3. ለልጆች ጤናማ አመጋገብን በሚያበረታቱ የማህበረሰብ ፕሮግራሞች እሳተፋለሁ።					
Self-Efficacy	1. ለልጄ የተመጣጠነ ምግብ ለማቅረብ ባለኝ አቅም በራስ መተማመን ይሰማኛል።					

	2. ለልጄ ጤናማ ምግብ ለማቅረብ እንቅፋቶችን ማሸነፍ እንደምችል አምናለሁ።					
	3. ለቤተሰቤ ጤናማ የምግብ ምርጫዎችን ማድረግ እችላለሁ።					

8.10 Oromifa version Questionnaires

Mata duree: Irra deddeebiin Nyaata Xiqqaa fi wantoota kanaan walqabatan Daa'imman Umriin Ji'a 6-23 Buufata Fayyaa Baha Itiyoophiyaa Godina Hararii magaalaa Harar keessatti argaman biratti, bara 2024
Odeeffannoo waliigalaa fi adda baasuu

05. Koodii hirmaataa /ID___

06. Guyyaa odeeffannoon itti walitti qabame / /
07. Kebele Kebelee
08. Seera Manaa

1. Socio demography

No	Gaaffii	Deebii	Darbuu /Yaada kennuu
Q.101	Umurii haadha moo kunuunsituu?	_____ waggoota	
Q.102	Baay'ina maatii	_____	
Q.103	Haalli gaa'ela keessanii amma maali?	1.Qulqulleettii 2.Gaa'ela godhate 3.Dubartoota abbaan manaa irraa du'e 4.Hiikaan 5.Kanneen biroo	
Q..104	Baay'ina daa'imman shanii gadii HH	_____	
Q.105	Amantaa	1.Ortodoksii 2.Muslim 3.Pirootestaantii 4.Kaatolikii 4.Kanneen biroo(ibsi) .	
Q.106	Sabummaa	1. Oromoo 2.Amaaraa 3. Tigrai 4. Gurage 5.Kanneen biroo(ibsi) .	

Q.107	Sadarkaan barnootaa (haati) kee maali?	1. dubbisuu fi barreessuu dadhabuu 2. mana barumsaa sadarkaa tokkoffaa(1-8) 3.mana barumsaa sadarkaa lammaffaa fi isaa ol	
Q.108	Sadarkaa barnoota abbaa	1. dubbisuu fi barreessuu dadhabuu 2. mana barumsaa sadarkaa tokkoffaa(1-8) 3.mana barumsaa sadarkaa lammaffaa fi isaa ol	
Q.109			
Q.110	Occupation of mother	1. Haadha manaa qofa 2. Qonnaan bulaa 3. Daldalaa/Daldala 4 Hojjetaa Dhaabbata Dhuunfaa 5. Hojjetaa mootummaa 6.Hojjetaa guyyaa guyyaa 7.Kanneen biroo(ibsi) .	
Q.111	Walqunnamtii saalaa daa'imaa	1. Dhiira 2. Dubartii	
Q.112	Umurii daa'imaa	_____Ji'oota	

2. Child characteristics

Q.201	Tartiiba dhalootaa	____th
Q.202	Bakka itti geejjibsiifamu	1.Mana 2.Dhaabbata fayyaa 3.Kan biroo(ibsi)_____ .
Q.203	Dhukkuba garaachaa torban darbe keessa?	1. Eeyyee 2. Lakki
Q.204	dhukkuba ho'a qaamaa torban darbe keessa	1. Eeyyee 2. Lakki
Q.205	dhukkuba biroo	1. Eeyyee 2. Lakki

3. Health Services Utilization

Q.301	Kana dura buufata fayyaa daawwattaniittuu (ANC) .	1. Eeyyee 2. Lakki
Q.302	Yeroo daawwannaa keessanitti waa'ee shaakala nyaata daa'immanii fi MMF barnoota fayyaa argattaniittuu	1. Eeyyee 2. Lakki
Q.303	PNC'f dhaabbata fayyaa daawwattaniittuu?	1. Eeyyee 2. Lakki
Q.304	Yoo eeyyee ta'e Q armaan olii Baay'ina daawwannaa PNC	

4. Questions to assess MMF

Q.401	Mucaan keessan yeroo ammaa harma hoosiisaa jiraa?	1. Eeyyee 2. Lakki	Yoo answee LAKK ta'e gaaffii lakk.
Q402	Sa'aatii 24 darban keessatti daa'imni kun yeroo meeqa harma hoosiste?	_____	
Q403	Yoo daa'imni harma hoosise, Daa'imni sa'aatii 24 darban keessatti nyaata jajjaboo, walakkaa jabaa ykn lallaafaa (aannan harmaa osoo hin dabalatin) yeroo meeqa nyaate?	1. Yeroo tokko 2. Yeroo lama 3. Yeroo sadii 4. Yeroo afur ykn afur ol	
Q.404	Mucaan keessan sa'aatii 24 darban keessatti nyaata armaan gadii keessaa tokko argateeraa? (Kanneen ilaallatu hunda filadhu)	[ ] Midhaan (fkn, daabboo, ruuzii) . [ ] Kuduraalee [ ] Fuduraalee [ ] Foon ykn qurxummii [ ] Hanqaaquu [ ] Pulsii (fkn, baaqelaa, qamadii) . [ ] Bu'aawwan aannani (fkn, yogurt, cheese) .	
Q.405	NON Daa'imman harma hoosisan ji'a 6-23		
Q.406	Harma hin hoosifamneef, Sa'aatii 24 darban keessatti daa'imni nyaata jajjaboo, walakkaa jabaa, ykn lallaafaa yeroo meeqa nyaate		

Q.407	Mucaan keessan sa'aatii 24 darbaniif foormulaa daa'immanii ni dhuga	1. Eeyyee 2. Lakki	
Q.408	Yoo Eeyyee Q'f ta'e, yeroo meeqa	1. Yeroo tokko 2. Yeroo lama 3. Yeroo sadii 4. Afur fi isaa ol	
Q.409	Mucaan keessan Aannan Beeyladaa ni dhuga (aannan haaraa, aannan qaruuraa ykn aannan budaa) sa'aatii 24 darbaniif	1. Eeyyee 2. Lakki	
Q.410	Yoo Eeyyee Q'f ta'e, yeroo meeqa	1. Yeroo tokko 2. Yeroo lama 3. Yeroo sadii 4. Afur fi isaa ol	
Q.411	Ijoolleen keessan sa'aatii 24 darbaniif Yogurt ni dhugu	2. Yes 2. No	
Q.412	Yoo Eeyyee Q'f ta'e, yeroo meeqa	1. Yeroo tokko 2. Yeroo lama 3. Yeroo sadii 4. Afur fi isaa ol	

5. **Questions to assess house hold food security condition(HFAIS)**

Q.501	Torban afran darban keessa, manni keessan nyaata gahaa akka hin arganne yaadda'aa turtanii?	1. Eeyyee 2. Lakki	IfNo,skip Q to 502
Q.501a	Kun yeroo meeqa raawwatame?	4. rarely(1x/2xinthepastfour weeks) 5. sometimes(3xto10x) often(>10x)	
Q.502	Torban afran darban keessa ati ykn fi miseensi mana manaa kamiyyuu sababa alackof gosoota nyaata filatte nyaachuu hin dandeenye	1. Eeyyee 2. Lakki	IfNo,skip to Q503

Q.502a	qabeenya?	.rarely(1x/2xinthepastfour weeks) 2. sometimes(3xto10x) often(>10x**)**	
Q.503	Torban afran darban keessa,ati moo mana kamiyyuu Hold member sababa hanqina qabeenyaatiin nyaata adda addaa alimited nyaachuu qaba?	1. Eeyyee 2. Lakki	IfNo,skip Q to 504
Q.503a	Kun yeroo meeqa raawwatame?	1arely(1x/2xinthepastfour weeks) 1. sometimes(3xto10x) often(>10x**)**	
Q.504	Torban afran darban keessa ati ykn miseensi manaa kamiyyuu nyaata dhuguma sababa hanqinaatiin nyaachuu hin barbaanne tokko tokko nyaachuu qabdaa? Qabeenya gosoota nyaataa biroo argachuuf?	1. Eeyyee 2. Lakki	IfNo,skip Q to 505
Q.505	Torban afran darban keessa, ati ykn miseensi maatii kamiyyuu nyaata xiqqaa si barbaachisuu sitti dhaga'ame caalaa nyaachuu qabdaa, sababiin isaas waan hin jirreef nyaata gahaa?	1. Eeyy ee 2. Lakk i	IfNo,skip Q to 506
Q.505a	Kun yeroo meeqa raawwatame?	1.rarely(1x/2xinthepastfour weeks)	
		2.sometimes(3xto 10x) 3.often(>10x	
Q.506	Torban afran darban keessa ati ykn miseensi maatii kamiyyuu nyaata xiqqaa nyaachuu qabdaa a guyyaa sababni isaas nyaanni gahaan waan hin jirreef?	1. Eeyy ee 2. Lakk i	IfNo,skipto Q 507
Q.506a	Kun yeroo meeqa raawwatame?	1.rarely(1x/2xinthepastfour weeks) 1. sometimes(3xto10x) often(>10x**)**	

Q.507	Torban afran darban keessa nyaanni tokkollee hin jiru turee sababa hanqina qabeenya nyaata argachuuf mana keessanitti gosa kamiiyyuu nyaachuu?	1. Eeyy ee 2. Lakk i	Ifno,skiptoQ 508
Q.507a	Kun yeroo meeqa raawwatame?	1rarely(1x/2xinthepastfour weeks) 1. sometimes(3xto10x) often(>10x**)**	
Q.508	Torban afran darban keessa,ati moo eenyullee Miseensi manaa nyaanni gahaa waan hin turreef halkan beela'ee rafu?	1. Eeyy ee 2. Lakk i	IfNoskipQ 509
Q.508a	Kun yeroo meeqa raawwatame?	. 1rarely(1x/2xinthepastfour weeks) 2. sometimes(3xto10x) often(>10x**)**	
Q.509	Torban afran darban keessa ati ykn miseensi manaa kamiyyuu waan hin jirreef homaa osoo hin nyaatin halkan guutuu deemtee Nyaata gahaa?	1. Eeyyee 2. Lakki	
Q.509a	Kun yeroo meeqa raawwatame?	. 1rarely(1x/2xinthepastfour weeks) 2. sometimes(3xto10x) often(>10x**)**	

6.Environmental Conditions

Q.601	Maddi bishaan dhugaatii keessan inni guddaan maali?	1 boolla bishaanii 2 Ujummoo ummataa 3 Bishaan qamadii fi bishaan qaruuraa keessatti kuufame
Q.602	Bishaan dhugaatii keessan ni qulqulleessittaa?	1. Eeyyee2.Lakki
	Mucaa keessan nyaachisuun dura harka keessan dhiqattu?	1. Eeyyee2.Lakki
Q.603	Balfa akkamitti gata?	1. Dirree banaatti gatuu.2.Inapit 3.Kanneen biroo (ibsi) .
Q.604	Mana fincaanii qabdaa	1. Eeyyee2.Lakki

7. Assesment of Dietary Diversity

	Garee Nyaataa	Fakkeenyota	Fayyadamaa? (Eeyyee/Lakki)
Q701	aannan harmaa		
Q702	Midhaan, hundee fi qamadii	Daabboo, ruuzii, paastaa, daabboo, boqqolloo, boqqolloo, .	
Q703	Legumes fi muuzaa	Baqalaa, baaqelaa, qamadii, muuzaa, sanyii	
Q704	Oomishaalee aannani	Aannani, daabboo, yogurt	
Q705	Nyaata foon (foon, qamadii, qurxummii) .	Foon loonii, hanqaaquu, qurxummii, kalee, foon orgaanii	
Q706	Hanqaaquu	Qophii hanqaaquu kamiyyuu (bilba'e, bilcheefame, kan qama'ame) .	

Q707	Kuduraalee fi muduraalee Vitamin-A badhaadhan	Paampii, kaarotaa, iskuwaashii, boqqolloo foon burtukaanaa qabu, magariisa baala dukkanaa'aa qabu	
Q708	Fuduraalee fi muduraalee biroo	Fuduraalee fi muduraalee armaan olitti hin tarreeffamne kamiyyuu kan akka banaanaa, abaaboo, kaabaajii, salaaxinaa	

8. Assesment of Wealth status

Q113 N.	Gosa qabeenya	**Response**		N.	**Asset type**	**Response**			
1	Humna ibsaa	1.Eeyyee	2.Lakk	15	Gaarii	1.Eeyyee	2.Lakk		
2	Televijiinii	1.Eeyyee	2.Lakk	16	Minjaala	1.Eeyyee	2.Lakk		
3	Raadiyoo	1.Eeyyee	2.Lakk	17	Barcuma	1.Eeyyee	2.Lakk		
4	Dhaabbataa	1.Eeyyee	2.Lakk	18	Soofaa	1.Eeyyee	2.Lakk		
5	bilbilaan bilbiluu			19	lafa qonnaa	1 eeyyee	2 lakk		
6	Mobaayila	1.Eeyyee	2.Lakk	20	horii	1.Eeyyee	2.Lakk		
7	Koompiitara	1.Eeyyee	2.Lakk	21	Mana jireenyaa ofii	1.Eeyyee	2.Lakk		
8	Kottolleessaa	1.Eeyyee	2.Lakk	22	Mitaad elektirikii	1.Eeyyee	2.Lakk		
9	Sa'aatii/sa'aatii	1.Eeyyee	2.Lakk	**Housing characteristics**					
10	Konkolaataa	1.Eeyyee	2.Lakk	23	Gosa lafaa	1.Mude	2.Ceme jechuun ni danda'ama	3.Seraamikii	4.K bir
11	Bajaaj	1.Eeyyee	2.Lakk	24	Gosa foddaa	1.Marga	2.Sibiilli korregeetii	3.Tiilee	4.K bir
12	Saayikilii mootoraa	1.Eeyyee	2.Lakk	25	Gosa dallaa	1.Mukaa fi dhoqqee	2.Ceme nt fi bilookii	3.Birkii s	4.K bir

9.Health Beilf Model construct

Questions on HBM constructs (please make “X” mark on the correct response		Strongly disagree=1	Disagree=2	Neutral=3	Agree=4	Strongly agree=5
Perceived Susceptibility	1. Mucaan koo soorata gahaa argachuu dhabuudhaaf balaa qaba jedheen amana.					
	2. Daa'imman biroo wajjin wal bira qabamee yoo ilaalamu daa'imni koo nyaata gaarii dhabuu irraa kan ka'e rakkoo fayyaa isa mudachuu danda'a jedheen yaada.					
	3. Mucaan koo soorata guddina fayya qabeessaaf isaan barbaachisu argachuu dhiisuu danda'a jedheen yaadda'a.					
Perceived Severity	1. Hanqinni nyaataa daa’ima koo irratti rakkoo fayyaa hamaa fiduu akka danda’u nan amana.					
	2. Mucaan koo soorata sirrii yoo hin arganne guddina isaa irratti dhiibbaa uumuu danda'a jedheen yaada.					
	3. Hanqinni nyaataa daa’ima kootiif dhimma fayyaa yeroo dheeraa fiduu akka danda’u nan amana.					
Perceived Benefits	1. Mucaa koo nyaata soorataa dhiyeessuun fayyaa waliigalaa isaa ni fooyyessa.					

	2. Mucaan koo nyaata madaalawaa akka nyaatu mirkaneessuun mana barumsaa keessatti ga’umsa gaarii akka qabaatan gargaara jedheen amana.					
	3. Nyaanni sirrii ta'e nyaachuun mucaa koo dhukkuba akka hin mudanne ittisuu danda'a jedheen yaada.					
Perceived Barriers	1. Mucaa kootiif nyaata fayya qabeessa ta'e bitachuuf natti ulfaata.					
	2. I believe that preparing nutritious meals takes too much time.					
	3. Mucaa kootiif nyaata fayya qabeessa qopheessuuf beekumsi akkan dhabe natti dhagahama.					
	4. Maatiin koo filannoo soorataa caalaa nyaata fayya qabeessa hin taane filatu jedheen yaada.					
Cues to Action	1. Waa'ee soorata daa'ima kootii ogeessota eegumsa fayyaa irraa gorsa argadheera.					
	2. Meeshaalee barnootaa (fkn, birooshura, poostaroota) waa’ee nyaata fayya qabeessa daa’immaniif argeera.					

	3. Sagantaa hawaasaa daa'immaniif nyaata fayya qabeessa ta'e jajjabeessan irratti nan hirmaadha.					
Self-Efficacy	1. I feel confident in my ability to provide nutritious meals for my child.					
	2. Gufuuwwan mucaa kootiif nyaata fayya qabeessa ta'e dhiyeessuu danda'u irra aanuu akkan danda'u nan amana.					
	3. Maatii kootiif nyaata fayya qabeessa ta'e filachuuf dandeettii qaba.					

8.11 Curriculum vitae

Personal Information

Full Name	Bereketabe Nega
Sex	Male
Date Of Birth	1987
Email	bereketaben@gmail.com
Telephone	+251912043358

Educational background

- BSc in Applied Biology from Ambo University.
- Msc in Medical Microbiology from Addis Ababa University, School of Medicine

Educational Level	Institution	Duration of time	Field Study	Qualification
Primary Education(1- 8)	Firehiwot primary and secondary school	1991– 1992 E.C	Basic science, social science and art	Certificate
Secondary (9-10)	Tikur Anbesa secondary school	1993- 1994E.C	Natural science	Certificate
Preparatory school(11-12)	Addis ketema preparatory school	1995–1996E.C	Natural science	Certificate
Higher Education	Ambo University	1997-1999 E.C	Public Health	BSc Degree
	Addis Ababa University	2005-2007 EC	Medical Microbiology	MSc

Experience

More than 8 years of experience as Graduate assistance and Lecturer at Haramaya University School of Biological sciences and biotechnology.

Language

Language	Speaking	Writing	Reading
Amharic	Excellent	Excellent	Excellent
English	Excellent	Excellent	Excellent

Skills

- Microsoft Office package: Microsoft Word, Excel, Access
- Database operation: Microsoft Office Access
- Able to perform software application like SPSS, , EPI INFO,KOBO

References

- Meseret Chimdesa (Phd)- Head department of Biology, Haramaya University,meseretc2019@yahoo.com
- Andualem Getachew, Biology and Biotechnology Coordinator, Haramaya University,andualem.ge@gmail.com
- Temesgen Tolla former Head Department of Biology, Haramaya University, tolstem@gmail.com

8.12 Approval sheet

HARAMAYA UNIVERSITY

Directorate for postgraduate programs

Research Title

_____

_____

Submitted by:

_____	_____	_____
Name of Student	Signature	Date

Approved by:

1 _____	_____	_____
Major advisor	Signature	Date
2 _____	_____	_____
Co-advisor	Signature	Date
3 _____	_____	_____
Research Thematic Area Leader	Signature	Date
4 _____	_____	_____
Chairman, SGC	Signature	Date
5 _____	_____	_____
PGPD	Signature	Date