Assessment of gender differential in magnitude and the risk factors of childhood malnutrition in Menz Keya District, North Shewa zone, Amhara Regional State, Ethiopia

BY

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Abstract

Background- Malnutrition remains one of the most common causes of morbidity and mortality among children throughout the world. The nutritional status of infants and children under five years of age is of particular concern since the early years of life are crucial for optimal growth and development malnutrition has been responsible, directly or indirectly, for 60% of the 10.9 million deaths annually among children under five. Malnutrition is an underlying factor in over half of under-five child death in Ethiopia, and children with severe acute malnutrition face 30-50 percent chance of dying unless treated.

Objective- to assess gender differential in the risk factors and magnitude of malnutrition among children of age 0-59 months in Menz Keya district North Shewa zone Amhara Regional state, Ethiopia.

Methods- the study design was community based comparative cross-sectional quantitative study and supplemented qualitative (FGD) methods. A total of 746 children were selected using cluster sampling technique. Quantitative data were collected using structured questionnaire and including anthropometric measurements. The study variables include; socio-economic and demographic characteristics, child and maternal related variables and environmental health conditions. Data were entered and processed using EPi-info and SPSS for analysis. The NCHS reference population standard of WHO was utilized to convert height and weight measurements into Z-scores of the H/A, W/H and W/A indices considering age and sex of the children.

Results-Stunting was found to be significantly higher in female children (36.7compared to 25.7%) among male children both in urban and rural areas. Among male children, age group of 6-11 and 48-59 months were found to be more affected by stunting.

It was found that multiple determinant factors among operating at individual (mother age, education of the mother, immunization status, and weaning time) and house hold levels (household income, family size) are significant predictors of stunting.

Wasting was found to be statistical significantly higher in male children than female children (14.7%) in urban and rural areas. children in the age group 48-59 months were more affected in both male and female.

Education of the mother, household income, family size, immunization status and waste disposal area were found to be the important determinant factors for wasting.

Underweight was slightly higher male children compared to female children (22% vs 20.1%). Educational status of the mother, duration of breast feeding, immunization status family size, household income, and domestic waste disposal areas were determinant factors for underweight.

Conclusions and recommendations- The finding of this study showed that the prevalence of stunting was higher in female children in both urban and rural areas compared to male. Whereas wasting and underweight were more common in male children than female children regardless of their place of residence. Educational status of the mother and family monthly income were important determinant factors for chronic malnutrition for both male and female children. Empowering women to improve their education and income generation potential is recommended.

Table of Contents page

List of Tables

Acronyms

AAU	Addis Ababa university
ANC	Anti national care
ARI	Acute respiratory illness
AOR	Adjusted odd ratio
BCG	Bacilace calamine gurine
BF	Breast feeding
CI	Confidence interval
DALYs	Disability-adjusted life years
DHS	Demographic and health survey
DPT	Diphtheria, pertusis tetanus
EBF	Exclusive breast feeding
FGB	Focused group Discussion
H/A	Height -for -age
HH	House Hold
MOH	Ministry for health
MUAC	Mid upper Arm circumference
NCHS	National center for health statistics
UNICEF	United nations children`s found
W/A	Weight –for- age
W/H	Weight for height
WHO	world health organization

1. Introduction

Malnutrition remains one of the most common causes of morbidity and mortality among children throughout the world. The nutritional status of infants and children under five years of age is of particular concern since the early years of life are crucial for optimal growth and development. Their nutritional well-being reflects household, community and national investments in family health thereby contributing both directly and indirectly to overall country development and in Particular, development of human resource (1).

Malnutrition has been responsible, directly or indirectly, for 60% of the 10.9 million deaths annually among children under five. The nutritional status of under five children is a sensitive indicator of a country's health status as well as economic condition. (2).

Malnutrition also a greatly affects physical growth, morbidity, mortality, cognitive development, reproduction, and physical work capacity (3). In sub-Saharan Africa, malnutrition accounts for about 2 percent of deaths and about 3 percent of disability-adjusted life years (DALYs) in under-five children. Malnutrition may adversely affect the child's intellectual development and consequently, health and productivity in later life (3).

Ethiopia is also one of the countries in sub-Saharan Africa with the highest rate of under five malnutrition. Malnutrition is an underlying factor in over half of under-five child deaths in Ethiopia, and children with severe acute malnutrition face a 30-50 per cent chance of dying unless treated (8). Demographic health survey of Ethiopia indicates the level of under five stunting, wasting, and underweight are 47%, 11% and 38% respectively (4).

In Amhara region the level of child malnutrition is higher than the national levels which are 57%are stunting, 14% are wasting and 49% are underweight (4).

2. Literature review

Nutritional status of children reflects house hold, community and nation development.

Malnutrition is serious global issue and the biggest risk factors for illness (6, 10). Under nutrition kills or disables millions of children every year and prevents million of children from reaching their full intellectual and provide potential (6).

Malnutrition is major public health problem in the developing countries that contributes a major role in child mortality, poor intellectual and physical development of children and reduced the body's natural defense against a vast range of disease (8,10)

Conditions of malnutrition, including micronutrient deficiencies, are directly responsible for 3.5 million to 5.5 million deaths in children under five each year. WHO 2009 report estimated that 178 million children in developing world remain undernourished and are too short for their age. Among these malnourished 9.2 million under five mortality worldwide, more than one third of these were due to malnutrition (17).

In developing world an estimated 230 million (39%) children under the age of five are chronically malnourished and about 54% of death among under five are associated with malnutrition (4). Most children with cute malnutrition live in south Asia and central Africa where such malnutrition account for a large number of deaths in children aged under five years. From 13 to 19 million children are affected by sever acute malnutrition globally (12).

Considering the level of underweight, more than one-quarter (27%) of all under five children in developing countries are underweight. the highest level of underweight prevalence (46%) are in south Asia (19). In sub- Saharan Africa one-quarter (28%) of all Children under five are underweight, from this Nigeria and Ethiopia alone accounts for more than one-third (37%) of all underweight children in sub-Saharan Africa. Male and female have almost similar underweight prevalence in Latin America and Caribbean, middle east and north Africa, sub-Saharan Africa, east Asia and pacific but in south Asia the prevalence in female (47%) was higher than their counter part(44%)(19).

The extent of malnutrition in a country is determined by the level of chronic mal nutrition prevalence of stunting. Among 559 million under five children in developing countries 156 million of whom are stunted. Of 156 million the highest lived in south Asia and Sub-Saharan Africa, 56.6 million and 47.7 million respectively (13).

The prevalence of malnutrition in Vietnam in 2007 indicates it is major problem of the public health and the level of underweight; stunting and wasting are high with 31.8%, 44.3% and 11.9% respectively (13). This is also true in the case of India with the prevalence 36.4% under weight, 51.6% stunting and 10.6% wasted (15).

In the sub Sahara African the prevalence of malnutrition in under five children is higher next to south Asia as indicated by many researches (7). In Kenya child mortality and malnutrition is high regarded less of the intervention done to reduce the level of malnutrition. About 30% under five children suffer from chronic malnutrition (stunted), 6%severly acute malnourished (wasted) and 20% are underweight (18)

As with most developing and sub Sahara African countries, the level of malnutrition in Ethiopia is high also posing a serious threat to economic development of the country (11). Malnutrition is the single greatest cause of childhood mortality in Ethiopia (i.e. 57% of all death of children under five years is related to malnutrition. (4, 11)

Trends estimated for the country as two different years survey, the prevalence of malnutrition has been an encouraging reduction in rate of chronic malnutrition among children under five years of aged (i.e. stunting declined from 52% in 200 to 47% in 2005) while under height declined from 47% in 2000 to 38% in 2005, but acute malnutrition (wasting) remained unchanged eleven percent(4).

As UNICEF reports in 2008 prior to the food crisis, In Ethiopia, 12 million children under the age of five are affected by severe acute malnutrition, and approximately 50 percent are chronically malnourished and estimates that 120,000 children have less than one month to live.(16). It is estimated that more than 237,232 children under five years old suffer from sever acute malnutrition in Ethiopia (11).

A study done in Tigray from October 2004 to January 2005 shows the prevalence of malnutrition is high in the area, the levels of stunting, under weight and wasting were 42.7%, 38.3% and 13.4% respectively(16). According to other study done in Gondar, Gumbrit in 2006 the prevalence of under fives malnutrition was 28.5% underweight, 24% stunting, and 17% wasted. The prevalence difference by sex was almost similar. The level of underweight in male 13.7%,and in female 13.9% while the prevalence of wasted in male 7.6% but in female ten percent(12).

Causes and determinates of malnutrition

Nutrition status of children is manifestation of host factor including house hold access to food, distribution of this food within house hold, availability and utilization of heath service, infection disease, and care provided to the child (10, 20).

The diverse inter linked and complex causes of the malnutrition are classified in three categories. Immediate cause include lower dietary intake; that is either not providing the right nutrition or the required amount of food, recurrent infection that reduced the children appetite their body's utilization of food and resist to infection. Underlying cause are food insecure (where families are unable to produce or purchase their own food or when there is unbalance intra house hold food distribution), lack of appropriate care due to negative social belief attitude and cultural practice children get less attention, lack of basic health service delivery (unable liability) or low utilization of heath service poor personal and environmental sanitation, inadequate water supply. Basic cause include political economic, social factor (11).

In the survey done in Uganda 25% of the children under five years of age were stunted out of which 61% were boys. The magnitude of the difference in stunting between males and females diminishes with improvement in socio-economic status. (21).

In Ethiopia, different determinant factors are identified by different researchers, for instance, study done in Gondar University Hospital from July 2005 to April 2006 identified maternal and paternal illiteracy, low monthly family income, family size and inappropriate feeding practice were implicated as determinant factors for under five years severe malnutrition (2). Similarly survey done in Tigray from October 2004 and January 2005 indicates Child age, maternal anthropometric characteristics, inadequate complementary foods, and area of residence as the main contributing factors to child malnutrition (16).

Gender and malnutrition

Various factors, including discrimination against female children in intra-family food distribution and healthcare, were thought to be a possible mechanism that results in inferior health and less chance of survival for female than male (1). Many studies in sub-Saharan Africa have occasionally reported a higher prevalence of stunting in male children compared to female children (22).

According to a research done in South Africa the levels of stunting of boys seemed to be significantly higher than that of girls, 27.1% and 23.4%, respectively, while there was no statistical as significant difference in underweight and wasting(5).

In study done in Uganda in 2002 children belonging to mother with no formal education or to mothers who stopped in primary school were significantly more likely to be stunted compared to their counterparts with mothers who were educated beyond primary school (21). Another research done in Egypt indicates that there is difference in the prevalence of malnutrition by gender, although it is not statistical significance. The level of stunting was higher in male children (19.9%) than female children (17.4%), the level of wasting was 2.9% in male children and 2.2% in female children. Underweight also higher in male children (4.4%) than female children (3.7%) (9). A meta-analysis done in Sub-Sahara Africa the prevalence of stunting was higher in male than female children in the poorest household and illiterate mother. For instance in Zambia 57% in male and 52% in male children in the poorest household. Similarly for illiterate mother 53.8% in male and 52.2 in female children (17).

In Ethiopia distribution of stunted children by gender also suggests that at country level and in rural areas male children are slightly more malnourished on average than female children. The prevalence of under five malnutrition greatly reduced by women empowerment and educating them, for instance the level of stunting of children of uneducated mother is 49.1% compared to 4.7% among educated mother. The prevalence of wasting for boys is also higher by about 1% than girls in both urban and rural areas (4, 23). In a thesis work done in Debrebrihan town indicated that the prevalence of stunting was 52.3% in female and 47.7% in male children (26). Review of status of malnutrition and trends in Ethiopia stated that the prevalence of wasting was mainly observed in children whose mother has no education and a result of insufficient and inappropriate supplementary foods, recurrent infectious due to unsanitary environment (25).

3. Objective of the study

General objective

To assess gender deferential in the risk factors and magnitude of malnutrition among children of age 0-59 months in Menz Keya district of North Shewa zone, Amhara regional state, Ethiopia.

Specific objectives

- To determine and compare the prevalence and determinants of under five malnutrition by their sex in the study area.
- To explore the social, cultural and economic factors linked to gender related views that might affect nutritional status of children.

4. METHODOLOGY

4.1 Study area and period

The study was conducted in Menz Keya district in north Shewa zone in Amhara region.

Menz Keya district has 66,581 total populations of which 11,825 are under five years of age residing in 12 rural kebeles and one urban kebeles (Zemero town). It is located at a distance of 314 Kilometers from Addis Ababa and 184 kilometers from Debrebrihan.

Menz Keya district covers 43,429.65 square kilometer of land area. The majority classified 46.6% as midland, while 23.9% as high land and 29.5% as low land. It is a food crop (tefe, wheat, barley, bean, etc) growing area that most of the farmers are based on this farming.

The production of crops is depending on the rain. The main rainy season is from June to August. The most common animals that bearing in the study area are sheep, got, cow, ox, donkey, and horse.

4.2. Study design; comparative cross-sectional quantitative study design was supplemented with focus group discussion.

4.3 Source and Study population

Source population was mothers or care giver with under five years of age children living in the district and the study population was mother or care givers with children of age 0-59 months. For qualitative study four FGDs 8 persons in each FGD.

4.4 Sample Size and Sampling procedure

Sample size

Sample size was calculated using two population proportion sample formula with the following assumption the prevalence of stunting in Gimbi district(urban), Oromia region in male is 43% and in female 28% (24). And 95% confidence level, the sample size was;

$$n = \frac{\left[Z_{1-\alpha/2}\sqrt{2p(1-p)} + Z_{1-\beta}\sqrt{p_1(1-p_1)+p_2(1-p_2)}\right]^2}{(p_2-p_1)^2}$$

Where P= (P1+P2)/2, P1=0.43, P2=0.28 Power of 80% , i.e (1-B) =0.80, $Z_{1-B} = 0.84$

$$n = \frac{\left[1.96\sqrt{2(0.36)\ (0.64)} + 0.84\sqrt{0.43\ (0.57) + (0.28)\ (0.72)}\right]^2}{(0.43-0.28)^2}$$

$n_1 = n_2 = 172$

n = n_1+n_2= 344 total samples

Considering design effect of 2 and allowance for possible non-response rate of 10% makes the final sample size ;(344X2) +68= 756 children and proportional allocation was used to allocate samples to each kebeles.

Sampling procedure

The study was employed multi-stage sampling technique. First, the study area was stratified in to one urban and 12 rural kebeles and then a total of 5 kebeles was purposively selected; one from urban and 4 from the rural kebeles. After selecting five study kebeles, then kebeles were clustered into villages (got). The numbers of households (760) with under five children were enumerated before the actual data collected.

It was carried out by identifying the center of the village and stirring arrow to get the direction and so as to precede the data collection. And the same procedure was repeated until the required sample size was obtained. The first household was selected randomly and the nearest household based on the distance of the door taken. The revised WHO systematic EPI cluster sampling technique was implemented to select the study subjects.

Interview was conducted with mothers of the children to fill the questionnaire and where there was no eligible respondent or the respondent refuses that the next house hold was considered for the study. In households with more than one children of age between 0-59 months, the youngest child was taken.

For qualitative data four FGD were conducted based on their education and sex two FGD for illiterate (one from illiterate women and one from illiterate men), two from educated (one from educated women, and one from educated men). For each FGD 8 participants were selected purposively based on their education and sex.

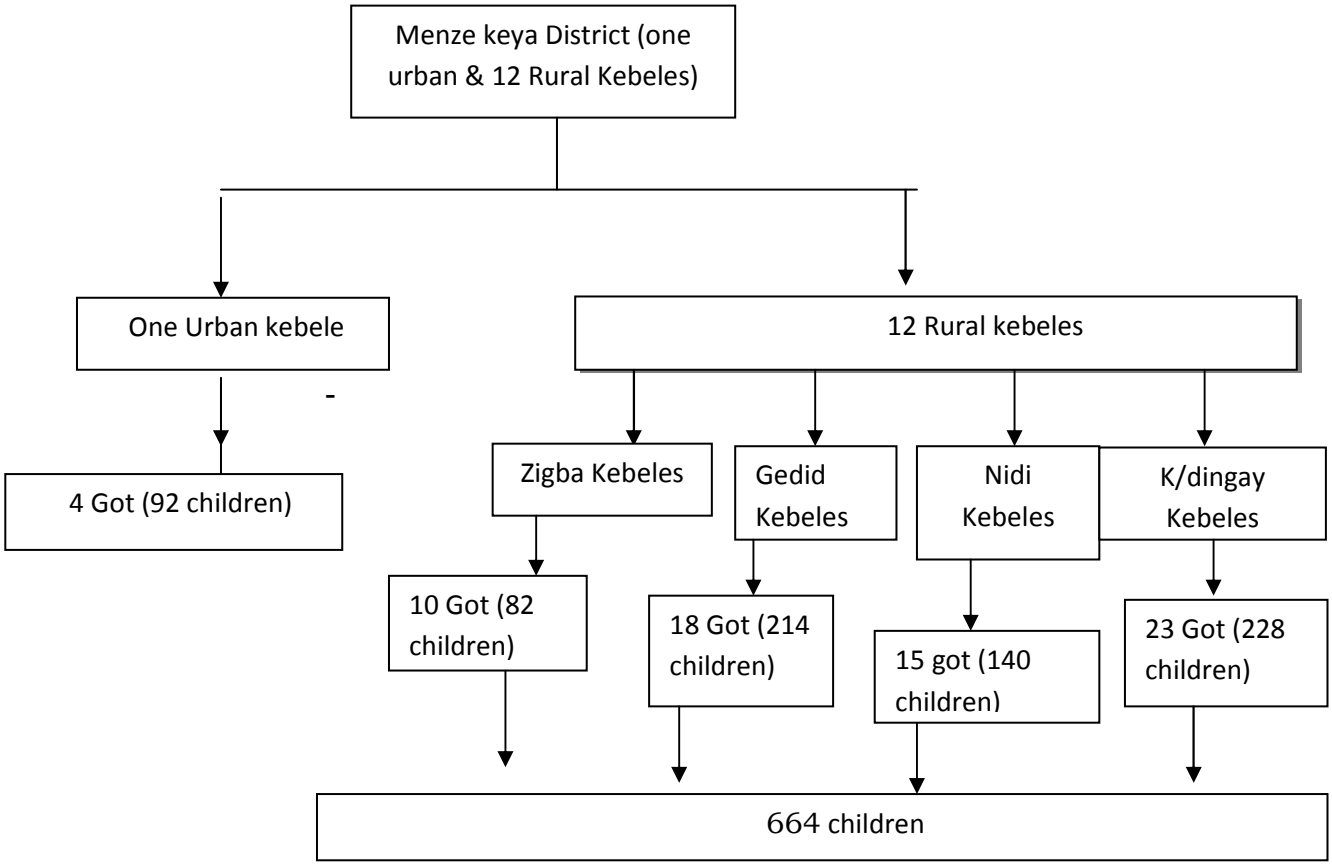

Fig1. Schematic presentation of sampling procedure

4.5 Study variables

- ***Dependent variable***

Prevalence of stunting, wasting and underweight as determined by anthropometric measurements

- **Independent variables**

Five categories of factors were assessed as independent variables;

- ***Socio-economic and demographic variables***; family size, income, maternal/paternal education and occupation
- ***Child characteristics***; Age, Sex, birth order, birth size/wt and morbidly status.
- ***Child caring practices***; feeding, immunization
- ***Maternal Caring and characteristics***; age, number of children ever born, ANC visits, health status during pregnancy,
- ***Environmental Health condition***; Water supply, sanitation and housing conditions

4.6 Data Collection

Data was collected using structured questionnaire and anthropometric measurements.

Eleven data collection team members including the principal investigator were involved in the data collection. They were recruited from Zemero clinic located in the district and health extension workers. The data collectors had diploma and certificate in nursing and working in the clinic.

Both the interviewers and supervisors were trained for four days from February 14 to February 17 2010 on the objective and methodology of the research, data collection and interviewing approach, anthropometric measurement and data recording.

Anthropometric measurement

Weight was measured with minimum clothing and no shoes using a Salter spring scale and beam balance in kilogram to the nearest of 0.1 kg.

Measurement of height (length) was done in a lying position with wooden board for children of age under two years (below 85 cm) and for children above two years stature was measured in a standing position in centimeters to the nearest of 1cm.

MUAC was measured on left mid upper arm to the nearest 1mm and the result was recorded for both children and their mothers. Only bilateral edema was considered as an indicator of sever acute malnutrition (kwashiorkor).

To identify retrospective morbidity of children, mothers were asked about any occurrence of illness during the past two weeks.

Vaccination status of children was checked by observing immunization card and if not available mothers were asked to recall it. BCG vaccination was checked by observing scar on right (also left) arm.

4.7 Data Quality Management

Questionnaire prepared in English translate into Amharic language for field work purpose and back to English for checking language consistency.

Pre-test was done before the actual data collection to see for the accuracy of responses and to estimate time needed. Weighing scales was calibrated with known weight object regularly. The scales indicators were checked against zero reading after weighing every child.

On daily basis collected information was reviewed and possible errors were returned to the collectors for correction. Epi-info, Epi-Nut soft ware was used to flag out of range values or errors while data processing.

4.8 Data processing and Analysis

First the data was checked for completeness and consistency. Then it was coded and entered in the computer using EPI 3.51 software. The soft ware has a program (Epi-Nut) to convert nutritional data into Z-scores of the indices; H/A, W/H and W/A taking age and sex into consideration using the 1998 NCHS reference population standard of WHO.

Then, data was exported to SPSS program for analysis; descriptive summary using frequencies, proportions, graphs and cross tabs used to present study results. P-value less than 0.05 was consider as statistically significant.

Bivariate and multivariate logistic regression analyses, were performed to identify determinants of nutritional status i.e. independent variables that has significant role in influencing nutritional status by sex difference.

4.9 Ethical consideration

Ethical clearance was obtained from AAU, faculty of Medicine and the local authorities was informed about the study objectives through letter written from the district health bureau to study kebele administration offices to enhance cooperation.

Verbal consent was obtained from each selected participant to confirm willingness. Honest explanation of the survey purpose, description of the benefits and an offer to answer all inquires were made to the respondents. Also affirmation that they were free to withdraw consent and to discontinue participation without any form of prejudice was made.

Privacy and confidentiality of collected information were ensured throughout the process.

To ensure efficiency of the survey; information was collected with the least burden to the respondents and justifiable budget. Relevant information which was wanted by the communities and organizations dedicated to improving the nutritional and general basic needs situation was collected. The investigator has commitment that finding's was used later to improve the nutritional situation and living conditions of the target population. For the acute malnourished children advice and referral was given.

4.10. Dissemination and Utilization of Results

After the data analyzed, based on the findings obtained, conclusions and commendations were made. Then the result of the study was submitted to the school of public health (AAU), Menz Keya district health office and other responsible bodies. The result was presented during thesis defense in the school of public health, as a partial fulfillment of MPH. Moreover, the findings of the study was published and disseminated through different journals and scientific publications if possible.

4.11. Operational Definitions

Acute malnutrition (wasting)-A nutritional deficit stat of recent onset related to sudden food deprivation or mal-absorption or poor utilization of nutrients which results in rapid weight loss. It refers to low weight-for-height <-2 SD of medial value of the national center for health statistics (NCHS) international weight for height reference. Sever wasting is defined <-3SD.

Chronic malnutrition (stunting)- reflects long-term cumulative effects of inadequate nutrition and health. Stunting defined as low height for age at <-2SD of medial value of the national center for health statistics (NCHS) international growth reference. Sever stunting is defined <-3SD.

Underweight= an anthropometric index of weight-for-age represents body mass relative to age. Underweight refers to a deficit and is defined as low weight for age at <-2 SD of medial value of the national center for health statistics (NCHS) international reference.

Gender differential- is the difference in the prevalence and determinant factors of under five malnutrition by gender.

Gender- refer to the economic, social and cultural attributes and opportunities associated with being male or female in a particular social setting and at a particular point in time.

Sex- is defined as the biological difference between males and females.

5. RESULTS

5.1 Socio-demographic and economic characteristics

Information was obtained from the total of 746 under five children (373 male and 373 female) children. It makes the response rate 98.7% for both groups.

Majority of children 211(56.76%) and 201(53.9%) males and females respectively were between the age of 24 and 59 months. One hundred fifty (40.2%) mothers of male children were aged 35 years and above where as 133(35.4%) of female children mothers were aged from 30-34 years old. Three hundred forty two (91.7%) and 332(89.0%) for both male and female children were married respectively. Among the total study subjects 342(91.7%) and 312(83.6%) in male and female children live in rural area respectively.

Regarding the head of house hold 341(91.4%) and 308(82.6%) from male and female children were male respectively. Of the total 746 households 210(56.3%) from male children and 199(53.3%) from female children mothers reported they had 4 or more family size in the house during the survey

Breast feeding was practiced by all mothers of the study participants in both groups. Two hundred sixty eight (71.8%) for male children and 229(61.4%) for female children breast fed for 24 or more months. Early weaning (less than 6 months) was found slightly higher 66(17.7%) in male children than female children 58(15.5%) (table 2)

Table 1:- Socio-demographic and other family characteristics of the respondents, Menz Keya Gebreal Woreda, April 2010

characteristics	Sex of Child			
	Male (%) (N=373)	Female (%) (N=373)	χ^2	p-valve
Marital status				
married	342(91.7)	332(89.0)	1.54	0.264
All others	31(8.3)	41(11.0)		
Household head				
male	341(91.4)	308(82.6)	12.90	0.01
female	32(8.6)	65(17.4)		
Mother education				
Illiterate	170(45.6)	183(49.1)	3.34	0.008
Primary	72(19.3)	82(22.0)		
Secondary & above	131(35.1)	108(29.0)		
monthly income (ETB)				
≤350	132(35.4)	161(43.2)	12.95	0.002
351-500	172(46.1)	124(33.2)		
≥500	69(18.5)	88(23.6)		
median	400	400		
Mother age(in years)				
≤19	17(4.6)	6(1.6)	23.60	<0.001
20-24	32(8.6)	34(9.1)		
25-29	80(21.4)	99(26.5)		
30-34	94(25.2)	133(35.4)		
≥35	150(40.2)	101(27.1)		
Mean ±SD	33.02±7.27	30.0±6.02		

Child age(months)				
0-5	45(12.1)	38(10.2)	12.84	0.025
6-11	64(17.2)	61(16.3)		
12-23	53(14.2)	73(19.6)		
24-35	53(14.2)	73(19.6)		
36-47	60(16.1)	61(16.3)		
48-59	98(26.3)	67(18.0)		
Mean ±SD	26.2±17.8	25.24±15.93		
Family size				
1-3	101(27.1)	67(18.0)	16.77	<0.001
4-6	134(35.9)	191(51.2)		
7+	138(37.0)	115(30.8)		
Median	6	6		
Religion				
Orthodox	362(97.1)	363(97.3)	6.08	0.067
Others	11(2.9)	10(2.7)		

5.2 Environmental Health Characteristics

Of the total 746 households 318 (85.3% from male and 329(88.2%) from female) had latrine. In both groups 261(70%) from male children and 297(79.6%) from female children got their water from safe source (protected spring and public pipe).

Among the whole households 171(45.8%) of male children and 137(36.7%) of female children had garbage pit (table 2)

Table 2 distribution of child caring practice and environmental characteristics of the respondents, Menz Keya Gebreal Woreda, April 2010

Characteristics	Sex of the child			
	Male (%) N=373	Female (%) N=373	$\chi 2$	p-value
Duration of breast feeding(months)				
≤12	12(2.9)	12(3.2)	9.49	0.009
13-24	94(25.2)	132(35.4)		
>24	268(71.8)	229(61.8)		
Mean ± SD	**34.76 ± 10.53**	**32.28 ± 9.88**		
Weaning time (months)				
1-5	66(17.7)	58(15.5)	0.62	0.49
≥6	307(82.3)	315(84.5)		
Mean ± SD	**5.7 ± 0.8**	**5.8 ± 0.75**		
Water source				
Safe	261(70.0)	297(79.6)	9.21	0.003
Unsafe	112(30.0)	76(20.4)		
Latrine				
Yes	318(85.3)	329(88.2)	1.41	0.28
No	55(14.7)	44(11.8)		
Waste disposal				
Open field	34(9.1)	25(6.7)	14.91	0.002
Pit	171(45.8)	137(36.7)		
Burning	73(19.6)	116(31.1)		
Pit & burning	95(25.5)	95(25.5)		

Description of nutritional status and determinant factors

Stunting was found to be higher in female children (36.7% compared to 25.7% among male children. Stunting was higher in female children in rural and urban area than male children. Among male children, age group of 6-11 and 48-59 months were found to be more affected by stunting. While age group 24-35 months were the least affected. But in female children age group of 12-23 were more affected by stunting. (Table-3, 4).

Wasting was found to be high 14.7% in male children with 3.8% severely wasted. But it was found to be low in female children with the prevalence rate of 9.7% and 1.1% severely wasted. In both sexes the age group 48-59 months was more affected with least affected age groups of 24-35 months. Wasting was higher in male children in rural and urban area than female children. (Table 3, 4)

Underweight were found 22% in male children and 20.1% in female children with 5.9% and 4.4% severely underweighted respectively. Underweight was higher in male children in rural and urban area than female children. (Table 3,4)

Table 3:- Distribution of Nutritional status of children aged 0-59 months by Age group for male and female children in Menz Keya Gebreal woreda, North Shewa zone April. 2010

Age (months)	Male N=373			Female N= 373		
	Stunting	**Underweight**	**Wasting**	**Stunting**	**Underweight**	**Wasting**
	No (%) Ht-for-age	No (%) Wt-for-age	No (%) Wt-for-Ht	No (%) Ht-for-age	No (%) Wt-for-age	No (%) Wt-for-Ht
0-5	12(12.0)	7(8.7)	7(13.0)	12(8.8)	7(9.3)	6(16.7)
6-11	23(24.6)	20(24.4)	8(14.8)	23(16.8)	12(16.0)	5(13.9)
12-23	14(14.5)	10(12.2)	6(11.1)	32(23.4)	18(24.0)	6(16.7)
24-35	10(10.4)	10(12.2)	5(9.3)	24(17.5)	8(10.7)	3(8.3)
36-47	14(14.5)	16(19.5)	11(20.4)	22(16.1)	10(13.3)	3(8.3)
48-59	23(24.6)	19(23.2)	17(31.5)	24(17.5)	20(26.7)	13(36.1)
Total	96 (25.7)	82 (22)	54 (14.7)	137(36.7)	75 (20.1)	36(9.7)

Table 4:- Distribution of Nutritional status of children aged 0-59 months by place of Residence for male and female children in Menz Keya Gebreal woreda, North Shewa zone April. 2010

Place of residence	Male N=373				Female N=373			
	Stunting	**Underweight**	**Wasting**	**Total**	**Stunting**	**Underweight**	**Wasting**	**Total**
	No (%)	No (%)	No (%)		No (%)	No (%)	No (%)	
Rural	86(25.1)	76(22.2)	49(14.3)	342	113(32.2)	64(20.5)	32(10.3)	312
Urban	10(32.3)	6(19.4)	5(16.1)	31	24(39.3)	11(18.0)	4(6.6)	61

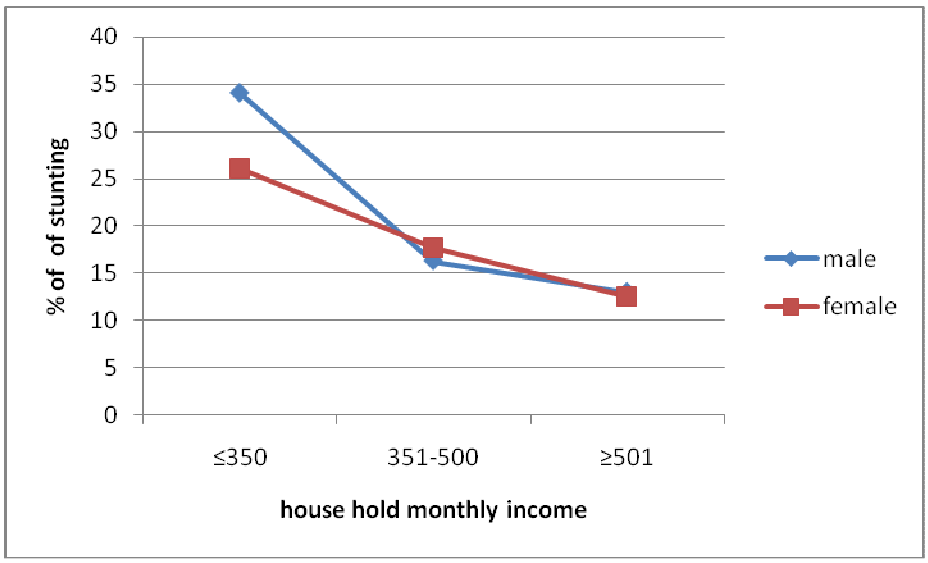

Fig 1 Distribution of stunting of children aged 0-59 months by monthly income for male and female children in Menz Keya Gebreal woreda, North Shewa zone April. 2010

5.3 Determinants of nutritional status

5.3.1 Stunting

Mother's age

Stunting was associated with mother age group of 25-29 years in male children (OR=1.91(1.05, 3.47)). Male children were 1.91 times higher chance of stunted among mother age groups of 25-29 years as compared with mother's age groups older or equal to 35 years. But it did not maintain the association after adjustment for confounder. Maternal age was not associated with stunting in female children. (Table 5)

Educational status of parents

Educational status of mother had association with stunting in both groups. a male child whose mother was illiterate 2.26 times higher stunted as compared with a child whose mother educational level was secondary and above. The association was maintained in multivariate regression model.

A female child was 5.66 times more susceptible for stunting in illiterate mother as compared to mother whose educational status was secondary or above. And even the association remained strong after adjustment for confounders (Table 5).

Weaning time

Stunting was found to have association with weaning time in male children (OR=2.20(1.26, 3.86). a male child who started weaning diet before 6 months of age was 2.20 times higher stunted as compared to a child who started weaning diet at 6 months or after 6 months of age. The association was remain stronger after controlling for confounders. But weaning time was not found to have association with stunting in female children (table 5).

Family income

House hold income was a strong determinant for stunting in both male and female children. A male child with in family whose monthly income less or equal to 350 Birr was 2.54 time more stunted as compared to a child within family whose monthly income 501 or above birr. A female child in family member whose monthly income less or equal to 350 Birr was 2.43 times higher stunted as compared with a child from house hold who has 501 or more Birr monthly income. It was maintained the association after adjusted for confounders in both groups (table 5).

Family size

Family size was found to have strong association with stunting in both groups. A male child in family size 1-3 was found 85% times less likely to be stunted as compared with family size of 7 or more. And in female child in family size 1-3 was 49% times less likely to be stunted as compared with family size of 7 or more. The association was also strong after controlling for confounders in both groups. (Table 5)

Table 5:- Factors affecting stunting among male and female children in Menz Keya Gebreal woreda, North Shewa zone April. 2010

Variables	Stunting							
	Male N=373				Female N=373			
	Yes (%)	No (%)	COR(95%CI)	AOR(95%CI)	Yes (%)	No (%)	COR(95%CI)	AOR(95%CI)
Individual level factors								
Marital status								
Married	26.1	73.4	1	1	36.7	63.3	1	1
Nonmarried	16.1	83.9	0.53(0.20,1.43)	0.48(0.17,1.40)	36.6	63.4	0.99(0.51,1.95)	1.35(0.64,2.85)
Mother age(years)								
≤19	35.7	64.4	1.93(0.67,5.62)	2.32(0.73,7.36)	33.3	66.7	0.66(0.12,3.85)	0.49(0.08,3.02)
20-24	21.9	78.1	0.99(0.39,2.49)	0.94(0.35,2.49)	35.3	64.7	0.74(0.33,1.64)	0.62(0.26,1.47)
25-29	35	65	**1.91(1.05,3.47)***	1.66(0.86,3.18)	31.3	68.7	0.62(0.34,1.09)	0.63(0.34,1.18)
30-34	23.4	76.6	1.08(0.59,2.00)	1.20(0.62,2.31)	36.8	63.2	0.79(0.46,1.33)	0.92(0.52,1.62)
≥35	22	78	1	1	42.6	57.4	1	1
Child age(months)								
0-5	26.6	73.4	1	1	31.6	68.4	1	1
6-11	35.9	64.1	1.54(0.67,3.56)	1.60(0.66,3.85)	36.5	63.5	1.31(0.56,3.09)	0.90(0.36,2.26)
12-23	26.4	73.6	0.99(0.40,2.43)	1.28(0.50,3.32)	43.8	56.2	1.69(0.74,3.86)	1.67(0.69,4.04)
24-35	18.9	81.1	0.64(0.25,1.66)	0.62(0.23,1.71)	32.9	67.1	1.06(0.46,2.46)	1.16(0.47,2.87)
36-47	21.9	78.1	0.84(0.34,2.04)	1.01(0.39,2.64)	36.1	63.9	1.22(0.52,2.89)	1.31(0.51,3.33)
48-59	23.5	76.5	0.84(0.38,2.89)	0.91(0.38,2.17)	33.8	66.2	1.21(0.52,2.82)	1.16(0.46,2.92)
Mother education								
Illiterate	35.9	64.1	**2.26(1.33,3.85)***	**2.35(1.34,4.1)***	48.6	51.4	**5.44(2.97,9.0)***	**5.66(3.0,10.6)***
Primary	12.5	87.5	0.58(0.25,1.31)	0.65(0.28,1.51)	39	61	**3.68(1.84,7.4)***	**3.18(1.87,7.8)***
Secondary+	19.8	80.2	1	1	14.8	85.2	1	1
Immunization								
Yes	23.7	76.3	1	1	35.3	64.7	1	1
No	36.1	63.1	**1.81(1.01,3.25)***	1.35(0.71,2.56)	44.3	55.7	1.46(0.84,2.54)	1.27(0.67,2.39)

Weaning time(months)									
1-5	39.4	60.6	**2.20(1.26,3.86)***	**2.37(1.30,4.34)***	34.5	65.5	0.89(0.50,1.60)	0.84(0.44,1.59)	
6+	22.8	77.2	1	1	37.1	62.9	1	1	
House hold factors									
Family size									
1-3	8.9	91.1	**0.15(0.17,0.32)***	**0.16(0.1,0.34)***	25.4	74.6	**0.5(0.3,0.99)***	0.63(0.33,1.23)	
4-6	23.9	76.1	**0.47(0.28,0.80)***	**0.49(0.29,0.9)***	38.7	61.3	0.95(0.59,1.5)	0.90(0.55,1.47)	
7+	39.3	60.7	1	1	40	60	1	1	
Monthly income (ETB)									
≤350	37.1	62.9	**2.54(1.26,5.12)***	**2.28(1.08,4.8)***	49.1	50.9	**2.4(1.4,4.3)***	**2.48(1.41,4.39)***	
351-500	19.8	80.2	1.06(0.52,2.16)	1.10(0.52,2.33)	26.6	73.4	0.91(0.5,1.68)	0.98(0.52,1.83)	
≥501	18.8	81.2	1	1	28.4	71.6	1	1	
Latrine									
Yes	24.5	75.5	1	1	36.8	63.2	1	1	
No	32.7	67.3	1.50(0.81,2.78)	1.40(0.71,2.74)	36.4	63.6	0.98(0.51,1.9)	1.07(0.54,2.12)	
Waste disposal									
open field	24	76	1	1	32.4	67.6	1	1	
Pit	41	59	0.70(0.32,1.56)	0.52(0.22,1.25)	25.2	74.8	2.19(0.82,5.8)	1.88(0.68,5.18)	
Burning	36	64	1.16(0.49,2.74)	0.95(0.37,2.45)	35.6	64.4	1.80(0.67,4.9)	1.57(0.56,4.38)	
Pit& burn	35	65	0.42(0.17,1.04)	0.39(0.15,1.05)	16.8	83.2	1.69(0.61,4.6)	1.33(0.46,3.83)	

*=p<0.05

5.3.2 Wasting

Educational status of the mother

Educational status of mother had association with wasting in both groups. A male child was 1.93 times higher wasted in illiterate mother as compared with educated mother up to secondary level or above. And female child born from illiterate mother was 2.57 times more likely to develop wasting as compared to a child born from educated mother up to secondary grade and above. But the association was lost after adjusting for confounders in male children whereas the association was remain strong after adjustment for confounders in female children (Table 6).

Immunization status

Immunization was strongly associated with wasting in male children (OR= 2.56 (1.32, 4.98). A male child was found 2.56 times more wasted in not immunized child as compared with immunized one. The association was maintained after controlling for confounders (table 6).

Family income

Regarding the monthly income of the house hold, it had strong association with wasting in male children (OR= (2.83(1.18, 6.81) and female children (OR= 3.32(1.12, 9.98). A male child in the house hold whose monthly income 350 or less Birr had 2.83 time higher chance to develop wasting as compared to a child in house hold whose monthly income 501 or more birr. And a female child in the house hold whose monthly income 350 or less Birr had 3.32 time higher chance to develop wasting as compared to a child in house hold whose monthly income 501 or more birr. It was maintained the association after adjusted for confounders in both groups (table 6).

Family size

Family size was found to have strong association with wasting in male children (OR=0.17(0.08, 0.36). A male child in family size 1-3 was found 83% times less likely to be wasted as compared with family size of 7 or more. The association was also strong after controlling for confounders. Family size was not associated with wasting in female children (Table 6).

Waste disposal area

Domestic waste disposal area was found to have a strong association with wasting in both groups. A male child was 80% times less likely to be wasted in the household that disposed the domestic waste product into pit as compared with open field disposal area. A female child was 83% times less likely to be wasted in the household that disposed the domestic waste product into pit as compared with open field disposal area. And the association was remain strong after controlling for confounders in both groups. (Table 6)

Table 6:- Factors affecting wasting among male and female children in Menz Keya Gebreal woreda, North Shewa zone April. 2010

Variables	wasting							
	Male N=373				Female N=373			
	Yes (%)	No (%)	COR(95%CI)	AOR(95%CI)	Yes (%)	No (%)	COR(95%CI)	AOR(95%CI)
Individual level factors								
Child age(months)								
0-5	15.6	84.4	1	1	18.8	81.2	1	1
6-11	12.5	87.5	0.78(0.26,2.32)	0.53(0.16,1.71)	8.2	91.8	0.48(0.14,1.69)	0.34(0.09,1.26)
12-23	11.3	88.7	0.69(0.22,2.24)	0.72(0.21,2.44)	4.3	95.7	0.48(0.14,1.60)	0.42(0.12,1.45)
24-35	7.9	92.1	0.57(0.17,1.92)	0.49(0.13,1.77)	4.1	95.9	**0.23(0.05,0.97)***	0.25(0.06,1.07)
36-47	18.3	81.7	1.22(0.43,3.44)	1.18(0.38,3.62)	4.9	95.1	0.28(0.07,1.18)	0.27(0.06,1.19)
48-59	17.4	82.6	1.14(0.44,2.98)	0.92(0.33,2.58)	19.4	80.6	1.28(0.44,3.71)	1.30(0.43,3.96)
Mother education								
Illiterate	20	80	**1.93(1.01,3.73)***	1.86(0.93,3.72)	13.1	86.9	**2.57(1.01,6.49)***	**2.66(1.01,6.99)***
Primary	6.4	93.6	0.58(0.20,1.66)	0.50(0.17,1.49)	7.3	92.7	1.34(0.42,4.32)	1.23(0.36,4.12)
Secondary+	11.5	88.5	1	1	5.6	94.4	1	1
Immunization								
Yes	12.2	87.8	1	1	9.3	90.7	1	1
No	26.2	73.8	**2.56(1.32,4.98)***	**2.85(1.36,5.97)***	11.5	88.5	1.27(0.53,3.04)	1.30(0.49,3.49)
Household level factors								
Family size								
1-3	9.4	90.6	**0.17(0.08,0.36)***	**0.16(0.06,0.39)***	14.8	85.2	0.49(0.23,1.04)	0.50(0.18,1.42)
4-6	13.3	86.7	0.42(0.12,1.89)	0.51(0.34,2.31)	8.2	91.8	0.61(0.23,1.64)	0.49(0.22,1.07)
7+	16.6	83.4	1	1	9.5	90.5	1	1
Monthly income								
≤350	24.2	75.8	**2.83(1.18,6.81)***	1.93(0.72,5.16)	13.7	86.3	**3.32(1.12,9.98)***	**3.9(1.22,12.43)***
351-500	8.7	91.3	0.85(0.33,2.18)	0.58(0.20,1.63)	6.5	93.5	1.84(0.56,6.08)	1.87(0.54,6.49)
≥501	10.1	89.9	1	1	4.5	95.5	1	1

Waste disposal								
Open field	17.7	82.3	1	1	24	76	1	1
Pit	18.1	81.9	**0.20(0.05,0.86)***	**0.11(0.02,0.53)***	11	89	**0.17(0.05,0.59)***	**0.29(0.10,0.88)***
Burning	4.1	95.9	0.81(0.28,2.30)	0.61(0.91,1.93)	5.2	94.8	0.33(0.11,1.04)	**0.14(0.04,0.50)***
pit& burn	14.7	85.3	1.03(0.39,2.71)	0.77(0.22,2.64)	9.5	90.5	0.39(0.13,1.13)	**0.21(0.06,0.71)***

Statistical significance at *=p<0.05

5.3.3 Underweight

Educational status of mother

Educational status of mother had strong association with underweight in both groups. A male child 1.97 times higher underweight and a female child was 3.59 times more likely to be underweight in illiterate mother as compared to mother whose educational status was secondary or above. And even the association was remain strong after adjustment for confounders in female children but not in male children (Table 7).

Immunization status

Immunization was strongly associated with underweight in male children (OR= 2.37 (1.31, 4.29). non-immunized male child was found 2.56 times more underweighted as compared with immunized male child. The association was maintained after controlling for confounders (table 7).

Duration of breast feeding

Underweight was strongly associated with duration of breast feeding in male children

(OR=6.78(1.92, 3.98). A male child who fed breast for 12or less months was 6.78 times higher underweight as compared with a child who fed breast for 24 or more months. The association was remain strong after controlling for confounders. But duration of breast feeding was not found to have association with underweight in female children (table 7).

Family income

Underweight was found statistically associated with monthly incomes of the family in both groups. A male child was 3.45 times more likely to be underweight in the household whose monthly income 350 or less Birr as compared with monthly income of 501 or more. A female child in family member whose monthly income 350 or more Birr was 2.47 times underweight as compared with monthly income of 501 or more Birr. The association was maintained after adjusted for confounders in both genders. (Table 7).

Family size

Family size was found to have strong association with underweight in male children (OR=0.10(0.04, 0.23). A male child in family size 1-3 was found 90% times less likely to be underweight as compared with family size of 7 or more. The association was also strong after controlling for confounders. Family size was not associated with underweight in female children (Table 7)

Waste disposal area and water source

Domestic waste disposal area was found to have a strong association with underweight in male children (OR=2.19(1.10, 4.34). A male child was 2.19 times more underweight in the household that disposed the domestic waste product on open field disposal area as compared with pit and burn. The association was remain strong after controlling for confounders. But it had no association in female children. Underweight was associated with the source of water in female children (OR= 2…23(1.23, 3.94). but it was lost the association after controlling. (Table 7)

Table 7 Factors affecting underweight among male and female children in Menz Keya Gebreal woreda, North Shewa zone April. 2010

Variables	underweight							
	Male N=373				Female N=373			
	Yes (%)	No (%)	COR(95%CI)	AOR(95%CI)	Yes (%)	No (%)	COR(95%CI)	AOR(95%CI)
Individual level factors								
Child age(months)								
0-5	15.6	84.4	1	1	18.4	81.6	1	1
6-11	31.3	68.7	2.47(0.94,6.47)	2.61(0.93,7.31)	19.7	80.3	1.09(0.39,3.05)	0.91(0.31,2.52)
12-23	18.9	81.1	1.26(0.44,3.64)	1.57(0.51,4.87)	24.7	75.3	1.45(0.55,3.85)	1.35(0.48,1.72)
24-35	18.9	81.1	1.26(0.44,3.64)	1.52(0.48,4.80)	11	89	0.55(0.18,1.64)	0.54(0.17,1.72)
36-47	26.7	73.3	1.97(0.74,5.31)	3.48(1.17,10.4)	16.4	83.6	0.87(0.30,2.52)	0.77(0.25,2.44)
48-59	19.4	80.6	1.31(0.51,3.37)	1.93(0.68,5.48)	29.9	70.1	1.88(0.71,4.99)	1.74(0.61,4.65)
Mother education								
Illiterate	30.2	69.8	**1.97(1.13,3.4)***	**1.88(1.05,3.4)***	27.9	72.1	**3.59(1.83,7.8)***	**4.02(1.9,8.5)***
Primary	8.3	91.7	0.41(0.16,1.04)	0.40(0.15,1.05)	17.1	82.9	2.02(0.87,4.81)	1.96(0.8,4.8)
Secondary+	18.3	81.7	1	1	9.3	90.7	1	1
Immunization								
Yes	19.2	90.8	1	1	21.2	78.8	1	1
No	36.1	65.9	**2.37(1.31,4.3)***	**2.31(1.18,4.5)***	14.8	85.2	0.65(0.30,1.38)	0.54(0.24,1.22)
Duration of breast feeding(months)								
≤12	63.3	36.7	**6.78(1.92,3.98)***	**10.38(2.5,42.4)***	33.3	66.7	1.89(0.56,6.53)	1.70(0.44,6.58)
13-23	21.3	78.7	1.03(0.59,1.18)	1.17(0.60,2.25)	17.4	82.6	0.80(0.46,1.38)	0.76(0.42,1.38)
≥24	20.5	79.5	1	1	21	79	1	1
House hold level factors								
Family size								
1-3	28.1	71.9	**0.10(,0.04,0.23)***	**0.10(0.04,0.26)***	22.9	77.1	0.68(0.32,1.44)	0.60(0.27,1.31)
4-6	24.1	75.9	**0.28(0.16,0.50)***	**0.30(0.17,0.55)***	18.9	81.1	0.70(0.40,1.22)	0.72(0.42,1.29)
7+	18.9	81.1	1	1	20.7	79.3	1	1

Monthly income(ETB)								
≤350	34.1	65.9	**3.45(1.57,7.58)***	**2.82(1.22,6.53)***	26.1	73.9	**2.47(1.2,5.1)***	**2.72(1.28,5.79)***
351-500	16.3	83.7	1.30(0.58,2.91)	1.28(0.54,3.01)	17.7	82.3	1.51(0.69,3.3)	1.58(0.70,3.59)
≥501	13	87	1	1	12.5	87.5	1	1
Water source								
Safe	21.5	78.5	1	1	17.2	82.8	1	1
Unsafe	16.3	83.7	1.107(.65, 1.88)	1.107(.65, 1.88)	31.6	68.4	**2.2(1.26, 3.94)***	1.70(0.84,3.47)
Waste disposal								
Open field	20.1	79.9	2.19(1.1, 4.31)*	1.00(0.37,2.72)	28	72	1.83(.95, 3.52)	0.90(0.34,2.43)
Pit	25.7	74.3	2.06(.94, 4.55)	1.07(0.35,3.28)	27.1	72.9	0.73(.34, 1.57)	0.48(0.15,1.54)
Burning	24.7	75.3	1.64(.59, 4.52)	0.59(0.19,1.86)	12.9	87.1	1.92(.69, 5.35)	0.55(0.17,1.77)
pit& burn	13.7	86.3	1	1	16.8	83.2	1	1

Statistical significance at *=p<0.05

5.4 Results for the qualitative study

5.4.1 Socio-cultural practice

Four focus group discussions were conducted segregated by sex and education level .each group consists of 8 participants. Most of the participants (mother and father) reported; there were gender discrimination in the nutritional habit of the community. Most of the community members give priority for their male children than their female children. One of illiterate father said ‘my male child eat with me what I eat, but my female children were eat with their mother’s’ but there were no difference in feeding practice for children whose age was below 2 years of age

But educated member of the group reported there was no discrimination of child feeding practice by their gender.

Regarding food distributions in the house hold participants view was mixed. Some of the participants reported that there was no equal distribution of the food for male and female children especially above 3 years of age children. The male children were more likely to be favored. While the other participants reported that there was no discrimination of food distribution in the household by the gender of the child. One of participant mother reported ‘I have 3 male & one female child, I want to give much food and tasty food for my female child, but for my sons I gave what I get’. Most of the participants said both mother and father have power to control the resources the house hold.

5.4.2 Breast feeding practice

Most of the respondents reported there was no difference in breast feeding practice. Participants view was mixed towards the difference in the prevalence of under nutrition by child gender.

5.4.3 Perceived prevalence of malnutrition

Majority of the participants reported male children were more likely affected and some of the respondents reported female children were more affected.

Regarding the causes of under nutrition, almost all of the participants reported inadequate food availability, large family size; inadequate child care was the causes.

6. Discussion

The study examined the difference in prevalence and determinant factors of under five malnutrition by the sex of the child. Stunting was found to be higher in female children compared to male children in both urban and rural areas. This finding was supported by the thesis done in Debrebrihan town (26).

Of all the variables used to measure the determinant factors among children 0-59 months children the individual level (mother age, education of the mother, immunization status, and weaning time) and house hold factors (household income, family size) were found to be the important factors for stunting. These factors were not uniform by the sex of the child.

In this study, educational status of the mother was found a strong determinant factor for chronic malnutrition in both male and female children. As the educational level of the mother increase the risk of being stunted was decreased. This is observed in studies done in Zambia, Kenya, Malawi and other sub-Saharan African countries (17). This study also showed that female children in illiterate mother were more affected by chronic malnutrition than their counter parts. This variation is explained by illiteracy of the mother put them to develop gender discrimination in distribution of food and child care (favoured male) in the house hold. This was also supported by the finding of FGD, that most of the illiterate mothers and fathers gave more priority for their male child than female child.

The finding in this study a large family size associated with an increase in the risk of stunting in male and female children. The effects of large family size with inadequate food supply, child care and other put the children at high risk of to be stunted.

The risk of stunting increased when the monthly income of the house hold lower than 350 Ethiopian Birr in both genders. Similarly poor family income has been found as risk factor of chronic malnutrition for male and female children in the study done around 12 African countries like Zambia, Kenya, Malawi, Uganda (17).

The study showed that non- immunized male children were more stunted as compared with female children.

The prevalence of acute malnutrition in the study area was found higher in male children than their contour parts in both urban and rural area. This finding was in consistence with studies done in Tigray (16), Egypt (9).

Of all the variables used to measure the determinant factors among children 0-59 months children education of the mother, household income, family size, immunization status and waste disposal area were found to be the important determinant factors for wasting. But the determinant factors were not the same for both groups of the study subjects.

Maternal illiteracy is found to be associated with a higher risk of acute malnutrition. This is observed in Gondor University (2).similarly review of the status of malnutrition and trends in Ethiopia stated that the highest prevalence of wasting was mainly observed in children whose mother has no education (25). Even though educational status of the mother was the strong determinant factor for both sex, wasting was revealed that in illiterate mothers more female children were wasted than their counter parts.

The risk of acute malnutrition is increased with ≤ 350 ETB monthly household income slight difference by the sex of the child. Similarly, lower families monthly income was found as a determinant factor for sever acute malnutrition in a study done in Gondor University (2). Female children in lower monthly family income were found at higher risk for acute malnutrition as compared to male children.

Large family size was found to have association with increased the risk of acute malnutrition in male children.

The finding of this study indicated disposing domestic waste products into open field was found to have association with increased the risk of acute malnutrition in both sex of the children with more stronger in fame children. Disposing waste product into open field makes the environment unsanitary and causes the development of infectious diseases and increase the risk of malnutrition. This fact supported by the finding of review of malnutrition and trends in Ethiopia indicated the highest prevalence of wasting observed in children whose environment was unsanitary that result the develop infectious diseases (25).

The general prevalence of underweight in the study area was lower than the national DHS 2005 finding and the finding of research done in Gondor (4, 12).

Regarding the prevalence of underweight difference by child sex, it was higher in male children than counter parts in both urban and rural area. This finding was supported by studies done in different areas (5, 9, and 12).

In this study the determinant factors for underweight were individual level factors (educational status of the mother, duration of breast feeding, immunization status) and house hold level factors (family size, household income, and domestic waste disposal areas). But there was a difference in some of the determinant factors by the gender of the children.

Maternal illiteracy is found to have strong association with increased the risk of mixed form of undernutrition in both genders with slight higher risk in female children.

The risk of underweight is increased when the monthly income of the household 350 or less Ethiopian Birr. The finding of focus group also showed the inadequate food supply and poverty were the causes for malnutrition in the study area.

Increased family size is associated with increase the risk of underweight in male children. The explanation for this could be having more number of children causes strain in the family resources and decrease care to children and increase the chance of underweight.

In this study breast feeding for 12 months or less is found associated with increased risk of underweight in male children whereas unsafe source of water increased the risk of underweight in female children.

7. Strengths and limitations

Strengths

The study tried to examine as often unexplored area of research in nutrition, looking at the problem of under nutrition through the gender lens.

Both qualitative and quantitative approached were employed to triangulate findings.

Limitations

Respondent might have not told us real information about their socio economic status, because of the need to get support. This could have brought some differences in association of variables.

The study design (cross-sectional) which measure the exposure and out come at the same time, cannot measure the cause and effect relationship.

8. Conclusions and recommendation

8.1 conclusions

Based on the findings of this study it can be concluded that; the prevalence of chronic malnutrition is higher in female children in both urban and rural area than their male counterparts. In contrary, acute malnutrition and mixed form of undernutrition (under weight) were more commonly encounted in male than female children regardless of their place of residence.

From individual level factors educational status of the mother and from household level factor family monthly income were important determinant factors for chronic malnutrition for both male and female children.

Weaning time and immunization status from individual level factors and family size from household level factor were determinant factors for stunting in male children.

Educational status of mother, family monthly income and waste disposal area are found important determinant factor for acute malnutrition in both male and female children Immunization status and family size were important determinants factors for wasting in male children

Mixed form of undernutrition (under weight is to be found associated with low family monthly income and illiteracy of the mother in both gender such as more higher in female children. Underweight in male children is found to be associated with increased family size, immunization status and duration of breast feeding.

8.2. Recommendation

At community level

- ☞ Promotion of better child care(immunization, weaning) water supply and waste disposal (sanitation of the environment) so as to reduce childhood disease and malnutrition.
- ☞ Encourage of women &family planning utilization.
- ☞ Promotion of equal distribution of food in HH for male and women.
- ☞ woreda education office and women affairs office should encourage women to stay in school

At program level

- ☞ Intervention initiatives should focus on improving HH food security, support income generation, nutrition education.
- ☞ Develop and encourage programs to improve women education and family planning practice.
- ☞ Improved multi-sectorial gender based intervention to address multifaceted risk factors of childhood malnutrition.
- ☞ Further community based studies are needed to see it the present gender differences are reproducible and staple overtime

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Annex ; English version Questionnaires

Information sheet

This sheet is to be read for the participants of the study. My name is _____. I am working as data collector in a survey conducted by the collaboration of Addis Ababa University, Medical faculty/ Department of community Health so as to assess the prevalence and gender deferential in the risk factors of malnutrition of under five age children at household level in Menz Keya district of North Shewa Zone in Amhara region.

Topic of the study- assessment of gender deferential in the risk factors and the prevalence of malnutrition of under five age children in Menz Keya district of North Shewa Zone in Amhara region.

Objective of the study- to assess the prevalence and gender deferential in the risk factors of malnutrition of under five age children

Some of the benefits of the study are -the result can be used as a baseline for further studies that can be done in district and zone, the result will be used to design prevention and control measures of the malnutrition, it also used to develop gender based nutritional program, if anybody is found to be malnourished during the survey, health information or advice will be given to visit the nearby health institution and appropriate dietary intake.

Risk of the study: - the participant will spend up to 30 minutes in the interview.

The right of the participant; The participant has full right to participate, not participate, stop participating in the study at any time, they don't have to answer any questions that they don't want to answer and ask questions which are not clear. However, your honest answer to these questions is very important for the purpose of the study.

Confidentiality of the participants is maintained and the participant name is not written anywhere on the paper.

If you have something to ask concerning the study, at any time you can contact the principal investigator Getabalew Endazenaw. By Phone No. 0911570138

Email zem_get@yahoo.com Or Addis Ababa university tele 0115538734

Informed consent form

I --------have well understood the study information sheet read above.

And now I am in a position -------- participate in the study by giving information.

To be voluntary ⟶sign below and conduct interview

Not to be voluntary-⟶ go to the next household

Signature of the interviewer ----------

(Signature of the interviewer certifies that informed consent has been given verbally by the respondent)

001. Questionnaire identification number /_____/_____/

002. Residence; 1. Urban 2. Rural

003. Interviewer name_____ Signature _____ Date_____

004. Result: 1. Completed 2. Partially completed 3. Others (Specify)

005. Checked by supervisor; Name_____signature_____ Date_____

If you have something to ask concerning the study, at any time you can contact the principal investigator by;

Getabalew Endazenaw. By Phone No. 0911570138

Email zem_get@yahoo.com

Or Addis Ababa university tele 0115538734

Thank You!

PART ONE: SOCIO-DEMOGRAPHIC VARIABLES

No	Question	Response	Skip to/Remark
101	Head of the HH	1. Male 2. Female	
102	Marital status	1. Married 2. Divorced 3. Widowed 4. Separate 5. Single	
103	How many people live in the HH?	In number_____	
104	How many children <5 year live in the HH	In number_____	
105	Have you ever attended education?	1. Yes 2. No	If no, skip to 108
106	What is the highest grade you completed?	1. Not attended formal education 2. Primary education 3. Secondary and above	
107	If your answer is not attended formal education, Do you able to read and write?	yes no	
108	Have your husband ever attended education?	1. Yes 2. No	If no, skip to 111
109	What is the highest grade he completed?	1. Not attended formal education 2. Primary education 3. Secondary and above	

110	If your answer is not attended formal education, Does he able to read and write?	1. yes 2. no	
111	What is your occupation?	1. Housewife 2. Farmer 3. Merchant/Trade 4. employee 5. Other (specify)	
112	What is your husband occupation?	1. Farmer 2. Merchant/Trade 3. employee 4. Other (specify)	
113	What is the Monthly income of the HH?	_____ Birr	
114	Who decides how the money you earn will be used?	1. Mainly spouse 2. Mainly husband 3. Only husband 4. only spouse 5. Both jointly	
115	Do you have some control and power (autonomy) in decision-making?	1. Yes 2. No	
116	Do you have livestock, herd or farm animal?	1. Yes 2. No	
117	Do you have agricultural lands?	1. yes 2. No	

118	Ethnicity	1. Oromo 2.Amhara 3. Tigre 4. Gurage 5. Others (specify)	
119	What is your religion	1.Orthodox 2.Muslim 3.Protestant 4. Catholic 5. Others(specify)	

Part Two child characteristics

No	Question	Response	Skip to
201	Child's sex	1. Male 2. Female	
202	Child's age	_____ Months	
203	Birth order	_____ th	
204	Place of delivery	1.Home 2.Health institution 3. Other (specify)	
205	Gestational age at birth	1. Less than 9 Months 2. At 9 months 3. Greater than 9 Months	
206	Was your child weighed at birth	1. Yes 2. No	If no, skip to 208
207	How much was the weight?	_____ Grams (card/recall?)	
208	Did you have plan (want) to give birth of the child?	1. Yes 2. No	

209	Does the child ever been immunized?	1. Yes 2. No	If no, skip to 211
210	Vaccines received (See card, if no card available ask them to recall) (More than one answer is possible)	1. BCG only (See Scar) 2.DPT(No of dose____) 3. Measles	
211	Vit. A supplementation in the past six months?	1. Yes 2. No	
212	Has the child had diarrhea in the last two weeks	1. Yes 2. No	If no, skip to 214
213	How frequent in a year	1. Once 2. Twice 3. 3-4 times 4. >5 times	
214	Has the child been ill with fever at any time in the last two weeks?	1. Yes 2. No	
215	Presence of respiratory disease in the last two weeks	1. Yes 2. No	
216	Has the child get sick with measles in the last year	1. Yes 2. No	
217	Presence of edema on the child (Observe)	1. Yes 2. No	

Part Three child caring practice

No	Question	Response	Skip to/Remark
301	Did you ever breast fed the child (NAME)?	1. Yes 2. No	If yes, skip to 303
302	If no, reason for not breastfeeding?	Reason_____	
303	How long after birth did you first out the child to breast feed?	1. Immediately 2. ____minutes 3.____ Hours 3. ____ Days	
304	Did you give the child (NAME) pre-lactation food/fluid?	1. Yes 2. No	If no, skip to 306
305	If yes, what did you gave him (her)?	1. Water 2. Butter 3. Milk 4. other (Specify)	
306	Did you squeeze out and throw the first milk?	1. Yes 2. No	
307	Are you still breastfeed?	1. Yes 2. No	If no, skip to 315
308	How many times in the last 24 hours you breastfed?	_____ Times	
309	Do you breast feed in the night?	1. Yes 2. No	

310	Did you give the child additional food or fluid other than breast milk in the past 48 hours?	1. Yes 2. No	If no, skip to 317
311	If yes, what ingredients you gave? (More than one answer is possible)	1. Cow's milk 2. Butter 3. Sugar solution. 4. Formula milk 5. Axmiet 6. Other (specify)	
312	How many times in 24 hours?	_____ times	
313	At what age did you start feeding other additional food?	_____ Months	
314	What do you use to feed the child	1. Bottle 2. Cup 3.Spoon 4.Other (specify)	
315	How many months did you breast-feed the child?	1. ____Months 2. Do not sure	
316	For how many months did you exclusively breast-fed the child?	1. _____ Months	
317	Who is usually taking care of the baby feeding?	1. Mother 2. Sister 3. Grandmother 4. House maid 5. Other (specify)	
318	During the illness, has the child feeding practice changed?	1. Yes 2. No	If no, skip to 321

319	How could the practice changed?	1. preventing from breast 2. preventing from giving food 3. Providing additional food 4. Other (specify)	
320	How did you usually treat your child when get sick	1. Usually home treatment 2. Taking to traditional healers 3. Taking to Health institution 4. Other (Specify)	
321	Have you ever take your child to health institution for sickness	1. Yes 2. No	
322	How many times have you ever taken the child to health institution getting sick?	_____ Times	

Part four maternal characteristics

No	Question	Response	Skip to
401	Mother's age in years	Year completed_____	
402	Age at first birth	_____ Years	
403	Age when the youngest child was born	_____ Years	
404	Total number of children ever born?	In number _____	

405	Pre-pregnancy weight (of the last pregnancy)	1. In kilogram_____ 2. Do not know/not sure/	
406	During pregnancy or lactation, did you consume extra food? (the child under the study)	1. Yes 2. No	
407	Health status during the pregnancy	1. Good 2. Not good/sick	
408	Did you visited health facility for ANC	1. Yes 2. No	If no, skip to 411
409	At what months of the pregnancy you started ANC	At _____ months	
410	How many times you visited health facility for ANC during the pregnancy?	_____ times	
411	Do you know about family planning?	1. Yes 2. No	If no skip to 413
412	Have you used family planning methods	1. Yes 2. No	
413	What do you think your child physically looks?	1. Thin 2. Tall 3. Heavy 4. Normal5. Small	

Part Five Environmental condition

No	Question	Response	Skip to/Remark
501	What is your main source of drinking water?	1. Pond 2. Un protected spring. 3. Protected spring. 4. Public tap 5. Other (specify)	
502	Do you treat water in any way to make it safer?	1. Yes (Specify) 2. No	
503	Do you have latrine?	1. Yes 2. No	If no skip to 505
505	How do you dispose garbage?	1. Open field disposal. 2. In a pit 3. Common pit 4. Composting 5. Burning 6. Other (specify)	
506	Type of House (Observation)	1.Tukul/thached 2. Corrugated Iron Sheet 3. Other(Specify)	

<u>Anthropometrical measurement</u>

Child weight in kilogram_____

Child height in centimeters _____

MUAC measurement in centimeters _____

Maternal Weight in kilogram _____

Maternal Height in centimeters _____

Semi-structure questionnaire for qualitative data collection

Guideline for focus group discussion (FGD)

The group will have 8-12 members based on sex, educational status. The principal investigator will moderate the discussion and somebody will also manage the tape recorder.

Introduction

Good morning/afternoon! Welcome to our group discussion. I am _____. I came from AAU, SPH. I am here today to discuss about gender differential in the risk factors and prevalence of child malnutrition of under the age of five. The discussion will be taken not more than one and half an hour. There is no right and wrong answer. All comments, both negative and positive have input for the study. Don't hesitate to say what you feel. I want this to be a group discussion so you need not wait for me to call on you. In order to not miss any points of the discussion I will be using a tape recorder.

I would like to confirm to you that all your comments are confidential and used for research purpose only. Your name will not be recorded to protect your confidentiality.

Thank you for your participation and genuine response for the discussion.

Discussion topics;

1. Are there socio-cultural practices, taboos, cultural beliefs or caring practices that affect women's, female and male children's nutritional status differently?
2. How is food distributed within the household between women, female and male children?
3. Who within the household has controls over resources and does this has impact on access to food and feeding habit?
4. Are there any differences in breast feeding practices for female and male babies?
5. If there is difference in feeding practice, does it has negative impact?
6. Do you think there is inequality in prevalence of malnutrition between female and male children?
7. If there is inequality in malnutrition rate, what is the reason for this inequality?

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õnÅ— G<—KG→ ð`SI SÖÃl” S<L

õnÅ— ›MJ”Ÿ< ¯¯Å→ŘT>kØK¨< u?ƒ Kõ/ò

¾S[Í cwdu=¨< ò`T----------

(¾S[Í cwdu=¨< ò`T S•` ÓKcvD ¾Ø“~ }d፟·ò KSJ” õnÅ— SJ“†¨<” ÁSK¡፟·M)

001. ¾SÖÃl SKÁ lØ`----------

002.***መኖሪያ***

1.**ከተማ** 2.**ገጠር**

003. **ውጤት**

1.**ሙሉ ለሙሉ ያለቀ** 2.**በከፊል የተሞላ**

3.**ሌላ ካለ ይገለፅ**

004. ¾S[Í cwdu=¨< eU---------- ò`T---------k”----------

005. ¾}q××]¨< eU---------- ò`T----------k”----------

ማንኛዉም ØÁo ካK-ƒ }S^T]¨<**ን** Ñ@፟·ባK¬ ጰ ”Ç²“¬ **በ**VvÃM 0911570138፣ Email zem_get@yahoo.com ***ወይም አዲስ አበባ ዩንቨርስቲ ስልክ*** 0115538734

ክፍል አንድ ፡ -ማህበራዊ እና ስነ ህዝብ መረጃ

ተ .ቁ	ጥያቄ	የተሰጠው መልስ	
101	የቤተሰቡ አሰተዳዳሪ ማን ነው?	1. ወንድ(አባት) 2 . ሴት(እናት)	
102	የጋብቻ ሁኔታ	1.ያገባች 2.አግብታ የፈታች 3.ባሏ የሞባት 4.ያላገባች	
103	የቤተሰብ ብዛት	በቁጥር	
104	ከአምስት ዓመት በታች ያሉ ስንት ልጆች አለውት?	በቁጥር	
105	ትምህርት ተምረዋል?	1.አዎ 2.አልተማኩም	መልስዎ 2 ቁጥር ከሆነ ወደ ጥያቄ 108 ይሸጋገሩ
106	መልስዎ አዎ ከሆነ ከፍተኛ የት/ት ደረጃዎ እስከ ስንተኛ ክፍል ነው?	1.መደበኛትምሕርት አልተማርኩም 2.እስከ አንደኛ ደረጃ 3.እስከ ሁለተኛ ደረጃና ከዚያ በላይ	
107	መልስዎ መደበኛትምሕርት አልተማርኩም ከሆነ ማንበብ ና መፃፍ ይችላሉን?	1.አዎ 2.አልችልም	
108	ባለቤትዎ ት/ት ተምረዋል?	1.አዎ 2.አልተማረም	መልስዎ 2 ቁጥር ከሆነ ወደ ጥያቄ 111 ይሸጋገሩ
109	መልስዎ አዎ ከሆነ ከፍተኛ የት/ት ደረጃቸው እስከ ስንተኛ ክፍል ነው?	1.መደበኛትምሕርት አልተማረም 2.እስከ አንደኛ ደረጃ 3.እስከ ሁለተኛ ደረጃና ከዚያ በላይ	

110	መልስዎ መደበኛ ትምሕርት አልተማረም ከሆነ ማንበብና መፃፍ ይችላሉን?	1.አዎ 2.አይችልም	
111	የተሰማሩበት ስራ መስክ ምንድን ነው (ከአንድ በላይ መልስ መስጠት ይቻላል)?	1.የቤት እመቤት 2.ገበሬ 3.ነጋዴ 4.የግል መስሪያ ቤት-ተቀጣሪ 5.መንግስት-ሰራተኛ 6.የቀን ሰራተኛ	
112	ባለቤትዎ በምን ስራ ላይ ተሰማርተው ይገኛሉ?	1.በግብርና 2.በንግድ 3.በመንግስት ስራ 4.በግል ስራ 5.በቀን ሰራተኛነት 6.ሌላ ካለ ይጠቀስ	
113	ወርሀዊ ገቢያችሁ ምን ያህል ነው?	በብር	
114	ያገኛችሁትን ገንዘብ እንዴት መጠቀምእንዳለባችሁ የሚወሰነው ማነው?	1.ባለቤቴ 2.እኔ እራሴ 3.በጋራ 4.ብዙ ጊዜ ባለቤቴ ነው	
115	እቤት ውስጥ ውሳኔ ለመስጠት የሚያስቸል ሀይል አለዎት?	1.አዎ 2.የለኝም	
116	የቤት እንሰሳት አለዋችሁ እንዴ?	1.አዎ 2.የለንም	
117	እርሻ መሬትስ አላችሁ እንዴ?	1.አዎ 2.የለንም	
118	ብሄር	1.አማራ 2.ትግሬ 3.ኦሮሞ 4.ጉራጌ 5.ሌላ ካለ ይገለፅ	

119	ሐይማኖት	1.ኦርቶዶክስ 2.ፕሮቴስታንት 3.ሙስሊም 4.ሌላ ካለ ይገለፅ	
	ክፍል ሁለት በልጁ ዙሪያ ያለ መረጃ		
201	የልጅዎ ፆታ	1.ወንድ 2.ሴት	
202	የልጅዎ ዕድሜ ስንት ነው?	_____ወር	
203	ስንተኛ ልጅዎ ነው?	___ኛ	
204	የት ነው የተወለደው?	1.እቤት ውስጥ 2.በጤና ድርጅት 3.ሌላ ካለ ይገለፅ	
205	በስንት ወርዎ ነው የወለዱት?	1.ከ 9 ወር በታች 2.በዘጠኝ ወሬ 3.ከ 9 ወር በላይ 4.እርግጠኛ አይደለሁም	
206	ልጅዎ ሲወለድ ክብደቱን ተለክቶ ነበር ?	1.አዎ 2.አልተለካም	መልስዎ አልተለካም ከሆነ ወደ ጥያቄ 208 ይሸጋገሩ
207	ከተለካ ክብደቱ ምን ያህል ነበር?	_____ኪሎ ግራም	
208	ለመውለድ እቅድ ነበርዎት?	1.አዎ 2.የለኝም	
209	ልጅዎ ተከትቦ ያውቃል?	1.አዎ 2.ያውቃል	መልስዎ ያውቃል ከሆነ ወደ ጥያቄ 211 ይሸጋገሩ
210	መልስዎ አዎ ከሆ የወሰደው የክትባ ዓይነት ምንድን ነው?	1.የሳንባ ነቀርሳ 2.መንጋጋ ቆልፍ፣ትክትክ ና ዘጊአናዳ 3.የኩፍኝ 4.የልጅነት ልምሻ	

211	ባለፉት 6 ወራት ውስጥ ቫይታሚን ኤ ተሰጥቶታል?	1.አዎ 2.አልተሰጠውም	
212	ልጅዎን ባለፉት 2 ሳምንታት ተቀማጥ አሞት ነበር?	1.አዎ 2.አልታመመም	መልስዎ አልታመመምከሆነ ወደ ጥያቄ 214 ይሸጋገሩ
213	በአመት ስንት ጊዜ አሞት ነበር?	1.አንድ ጊዜ 2.ሁለት ጊዜ 3.ሶስት ጊዜ-አራት ጊዜ 4.ከአምስት ጊዜ በላይ	
214	ባለፉት ሁለት ሳምንታት ልጅዎት በትኩሳት ታሞ ነበር?	1.አዎ 2.አልታመመም	
215	ልጅዎን ባለፉት 2 ሳምንታት የመተንፈሻ አካለ-ንስ አሞት ነበር?	1.አዎ 2.አላመመውም	
216	ልጅዎ በኩፍኝ ታሞ ያውቃል?	1.አዎ 2.አያውቅም	
217	በልጅዎ እግር ላይ እብጠት ይታያል?	1.አዎ 2.አይታይም	

ክፍል ሶስት ፡-የልጅዎን እንክብካቤ በተመለከተ

301	ልጅዎን ጡት አጥብተው ያውቃሉ?	1.አዎ 2.አላውቅም	መልስዎ አዎ ከሆነ ወደ ጥያቄ 303 ይሸጋገሩ
302	መልስዎ አላውቅም ከሆነ ምክነያትዎ ምንድን ነው?	ምክነያቱ ይገለፅ	
303	ከወለዱ ከምን ያህል ጊዜ በኋላ ነው የመጀመሪያውን ጡት የሚያጠቡት?	1.ወዲያውኑ 2.___ደቂቃ በኋላ 3.___ከስዓት በኋላ 4.___ቀን በኋላ	

304	ጡት ከማጥባትዎ በፊት ሌላ፣ ምግብ ይሰጡታል?	1.አዎ 2.አልሰጠውም	መልስዎ አልሰጠውም ከሆነ ወደ ጥያቄ 306 ይሸጋገሩ
305	መልስዎ አዎ ከሆነ የሚሰጡት ምግብ ምንድን ነው?	1.ውሃ 2.ቅቤ 3.ወተት 4.ሌላ ካለ ይገለፅ	
306	የመጀመሪያን የጡት ወተት ለልጅዎ ሳታጠቡ ያፈሱታልን?	1.አዎ 2.አላፈሰውም	
307	አስከ አሁን ልጅዎን ጡት እያጠቡት ነውን?	1.አዎ 2.አላጠባም	መልስዎ አላጠባም ከሆነ ወደ ጥያቄ 309ይሸጋገሩ
308	መልስዎ አዎ ከሆነ ባለፉት 24 ስዓታት ውስጥ ስንት ጊዜ አጠቡት?	_____ጊዜ	
309	ሌሊትም ያጠቡታል?	1.አዎ 2.አላጠባውም	
310	ባለፉት 48 ስዓታ ውስጥ ከጡት ወተት ሌላ ተጨማሪ ምግብ ሰጥተውታል?	1.አዎ 2.አልሰጠሁት	መልስዎ አልሰጠሁትም ከሆነ ወደ ጥያቄ 317 ይሸጋገሩ
311	መልስዎ አዎ ከሆነ የሰጡት ምግብ ምንድን ነው?	1.የላም ወተት 2.የስኳር ድብልቅ 3.የተቀመመ ወተት 4.አጥሚት 5.ሌላ ካለ ይገለፅ	
312	በ 24 ስዓት ውስጥ ስንት ጊዜ ሰጥተውታል?	_____ጊዜ	
313	ለልጅዎ ተጨማሪ ምግብ መስጠት የጀመሩት በስንት ወሩ ነው?	_____ወር	
314	ልጅዎን ለመመገብ የሚጠቀሙት መሳሪያ ምንድን ነው?	1.ጠርሙስ 2.ብርጭቆ 3.ማንኪያ 4.ሌላ ካለ ይገለፅ	

315	**ጡት የሚያጠቡት ለስንት ወር ነው**?	1._____**ወር** 2. **እርግጠኛ አይደለሁም**	
316	**ልጅዎን ጡት ብቻ የሚያጠቡት ለሰንት ወር ነው**?	_____**ወር**	
317	ልጅዎን የሚከባከቡው ና የሚመግቡው ማነ ው	1.እናቴ 2.እህቴ 3.እኔ እራሴ 4.ሰራተኛ	
318	ልጁን በሚያ መውጊዜ አመጋገቡ ይቀየራል?	1.አዎ 2.አይቀየርም	መልስዎ አይቀየርም ከሆነ ወደ ጥያቄ 321 ይሸጋገሩ
319	እንዴት ነውየሚቀየረው?	1.ከጡት መጥባትያቆማል 2.ምግብ መመገብ ያቆማል 3. ሌላ ካለ ይገለፅ	
320	ልጅዎ ሲታመም እንዴት ነው የሚያክሙት?	1.በቤት ውስጥ 2.ወደ ባህል ሀኪሞች በመውሰድ 3.ወደጤና ድርጅት በመውሰድ 4.ሌላ ካለይገለፅ	
321	ሲታመም ለማሳከም ወደ ጤና ድርጅት ወስደውት ያውቃሉ	1አዎ 2.አላውቅም	
322	መልስዎ አዎ ከሆስንት ጊዜ ነው የወሰዱት	_____ጊዜ	
	ክፍል አራት የእናቲቱ ሁኔታ በተመለከተ የሚወሰድ መረጃ		
401	እድሜዎ ስንት ዓመት ነው?	_____አመት	
402	የመጀመሪያ ልጅዎን የወለዱት በስንት አመትዎ ነው?	_____አመት	
403	የመጨረሻ ልጅዎን የወለዱት በስንት አመትዎ ነው?	_____አመት	

404	በአጠቃላይ ስንት ልጅ ወለዱ?	በቁጥር _____	
405	የመጨረሻ ልጅዎን ከማርገዝዎ በፊት ከብደትዎ ስንት ነበር?	1. ____ኪ.ግራም 2.አላውቀውም	
406	በእርግዝና ወይም ጡት በሚያጠቡበት ጊዜ ተጨማሪ ምግብ ይመገባሉ?	1.አዎ 2.አልመገብም	
407	በእርግዝና ጊዜ የሚሰማዎት የጤና ሁኔታ ምን ይመስል ነበር?	1.ጥሩ 2.ያመኝ ነበር	
408	ለእርግዝና ምርመራ ወደ ጤና ድርጅት ሄደውያውቃሉ?	1.አዎ 2.አላውቅም	መልስዎ አላውቅም ከሆነ ወደ ጥያቄ 411ይሸጋገሩ
409	በስንተኛ ወርዎ ነበር የሄዱት?	_____ወር	
410	ስንት ጊዜ ለእርግዝና ምርመራ ወደ ጤና ድርጅት ሄደዋል?	_____ጊዜ	
411	ስለ ቤተሰብ እቅድ(መቆጣጠሪያ) ያውቃሉ?	1.አዎ 2.አላውቅም	መልስዎ አላውቅም ከሆነ ወደጥያቄ 413 ይሸጋገሩ
412	መልስዎ አዎ ከሆነ ተጠቅመው ያውቃሉ?	1.አዎ 2.አልተጠቀምኩም	
413	የልጅዎን ሰውነት እንዴት ያዩታል	1.ቀጭን 2.ከባድ 3.ትክክለኛ 4.ሌላ ካለ ይገለፅ	

ክፍል አምስት የአካባቢ ሁኔታ

501	የምትጠጡትን ውሐ የምትቀዱት ከየት ነው?	1.ከ ኩሬ 2.ንፅህና ውካልተጠበቀ ምንጭ 3.ንፅህና ውከተጠበቀ ምንጭ 4 ከግል ጉድጓድ 5.ከህዝብ ቧንቧ 6.ሌላ ካለ ይገለፅ	
502	ወሐውን አክማቹሁ ነው የምትጠቀሙት?	1.አዎ 2.አናክምም	
503	ሽንት ቤት አላቹሁ?	1.አዎ 2.የለንም	
504	በአካባቢያቹሁ ያለውን ቆሻሻ ወዴት ነውየምታስወግዱት?	1.በሜዳ ላይ በመጣል 2.በጉድጓድ ውሰጥ በመጨመር 3.በማቃጠል 4.በመቅበር 5.ሌላ ካለ ይገለፅ	
505	ቤትዎ ከምን የተሰራ ነው?	1.የሳር ቤት 2.የቆርቆሮ ቤት 3ሌላ ካለ ይገለፅ	

Anthropometrical measurement

የልጅዎ ክብደት _____ከ.ግ

የልጅዎ ቁመት _____ ሣ.ሜ

የላይኛ ና መካከለኛውክንድ ዙሪያ _____ ሣ.ሜ

የእናቲቱ ክብደት _____ከ.ግ

የእናቲቱ ቁመት _____ ሣ.ሜ

የ ቡድን ውይይት መመሪ ያ

ቡድኑ በ ዖታ እና በት/ት ደረጃ ተመስ ር ቶ ከ 8-12 የ ሚደ ር ሱ አ ባ ላ ት ይኖ ሩ ታ ል ፡ ፡ ዋ ና ው ተ መ ራ ማ ሪ ውይይ ቱ ን የ ሚ መ ራ ሲ ሆ ን አ ን ድ ሌ ላ ሰ ው ደ ግ ሞ ቴ ብ ሪ ከ ር ደ ሩ ን ይ ቆ ጣ ጠ ራ ል ፡ ፡

መግ ቢ ያ

እ ን ደ ምን አ ደ ራ ች ሁ /ዋ ላ ች ሁ! እ ኔ ጌ ታ ባ ለ ው እ ን ዳ ዘ ና ው እ ባ ላ ለ ሁ የ መ ጣ ሁ ት ከ አ ዲ ስ አ በ ባ ¿ኒ ቨ ር ሰ ቲ ጤና አ ጠ ባ በ ቅ የ ት/ት ክ ፍ ል ሲ ሆ ን ዛ ሬ እ ዚ ህ የ ተ ገ ኘ ሁ ት Ÿ›Ueƒ ›Sƒ °ÉT@ uታ‹ vK< Qé“ƒ LÃ ¾T>Ÿc}¨<” ¾UÓw Ø[ƒ U¡”Á„‹ “ SÖ” ue`›} ï M¿’ƒ ከ 1፡ 30 ባ ል በ ለ ጠ ኒ ዜ ው ስ ጥ ለ መ ወ ያ የ ት ነ ው ፡ ፡ በ ው ይ ይ ታ ች ን ጊ ዜ ት ክ ክ ል ና ስ ህ ተ ት የ ሚ ባ ል መ ል ስ የ ለ ም ሁ ሉ ም የ ም ታ ስ ተ ላ ል ፏ ቸ ው ሀ ሳ ቦ ች በ መ ሉ ለ እ ኔ ጥ ና ታ ግ ብ ዓ ት ነ ት ስ ለ ሚ ያ ገ ለ ግ ሉ የ ሚ ሰ ማ ች ሁ ን ሀ ሳ ብ ከ ማ ን ሸ ራ ሸ ር ወ ደ ኋ ላ ማ ለ ት የ ለ ባ ች ሁ ም ፡ ፡ የ ቡ ድ ን ው ይ ይ ት እ ን ዲ ሆ ን ስ ለ ም ፈ ል ግ እ ኔ ስ ማ ች ሁ ን ሳ ል ጠ ራ በ ራ ሳ ች ሁ ተ ነ ሳ ሽ ነ ት ሀ ሳ ባ ች ሁ ን ግ ለ ፁ ፡ ፡ ሀ ሳ ባ ች ሁ እ ን ደ ያ መ ል ጠ ኝ ስ ለ ም ፈ ል ግ በ ቴ ብ እ ቀ ዳ ዋ ለ ሁ ፡ ፡ እ ዚ ህ ላ ይ አ ን ድ ነ ገ ር ላ ረ ጋ ግ ጥ ላ ች ሁ እ ወ ዳ ለ ሁ ፡ ፡ የ ም ት ሰ ጡኝ ማ ና ቸ ው ም ሀ ሳ ብ ከ ጥ ና ቱ ባ ለ ፊ ለ ሌ ላ ነ ገ ር አ ይ ው ል ም ፤ በ ሚ ስ ጢ ር ም ይ ጠ በ ቃ ል በ ተ ጨ ማ ሪ ም ስ ማ ች ሁ አ ይ መ ዘ ገ ብ ም ፡ ፡

በ ቅ ድ ሚ ያ በ ው ይ ይ ት በ መ ሳ ተ ፋ ች ሁ እ ና ከ ል ብ በ መ ነ ጨ ስ ሜ ት ስ ለ ም ታ ደ ር ጉ ት ው ይ ይ ት አ መ ሰ ግ ና ለ ሁ ፡ ፡

የ መ ወ ያ ያ ነ ጥ ቦ ች ፡ -

- ✓ የ እ ና ቶ ች ን ና የ ህ ፃ ና ት ን የ ም ግ ብ ሁ ኔ ታ በ ተ ለ ያ ያ መ ል ኩ ተ ፅ ዕ ኖ ሊ ያ መ ጣ የ ሚ ቸ ል የ ተ ከ ለ ከ ለ ማ ህ በ ራ ዊ እ ና ባ ህ ላ ዊ እ ም ነ ት አ ለ ን ?
- ✓ በ ቤ ት ው ስ ጥ ለ እ ና ቶ ች ፣ ለ ወ ን ድ ና ሴ ት ህ ፃ ና ት ያ ለ ው የ ም ግ ብ ስ ር ጭ ት ም ን ይ መ ስ ላ ል ?
- ✓ በ ቤ ት ው ስ ጥ ያ ለ ው ን ሀ ብ ት የ ሚ ቆ ጣ ጠ ረ ው ማ ነ ው ? ይ ህ በ ም ግ ብ አ ቅ ር ቦ ት ና አ መ ጋ ገ ብ ስ ር ዓ ት ላ ይ ተ ፅ ዕ ኖ አ ለ ው ን ?
- ✓ በ ወ ን ድ እ ና ሴ ት ህ ፃ ና ት ላ ይ ጡ ት አ ጠ ባ ብ ላ ይ ል ዩ ነ ት አ ለ ው?
- ✓ ል ዩ ነ ት ካ ለ ው አ ሉ ታ ዊ ተ ፅ ዕ ኖ አ ለ ው ወ ይ ?
- ✓ የ ም ግ ብ እ ጥ ረ ት መ ጠ ን በ ወ ን ድ እ ና ሴ ት ህ ፃ ና ት ላ ይ ል ዩ ነ ት አ ለ ው እ ን ዴ?
- ✓ ል ዩ ነ ት አ ለ ው ብ ለ ው የ ሚ ያ ስ ቡ ከ ሆ ነ ለ ዚ ህ ል ዩ ነ ት ም ክ ን ያ ቱ ም ን ድ ን ነ ው?

Declaration

I the undersigned, declare that this thesis is my original work, has never been presented in this or any other University, and that all the resources and materials used for the thesis, have been duly acknowledged.

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Place: Addis Ababa, Ethiopia

Date of submission:

This thesis has been submitted for examination with my approval as a University advisor.

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Date: