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BAHIRDAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCE

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF EPIDEMIOLOGY AND BIOSTASTICS

THE ASSOCIATION OF MATERNAL WORK STATUS OUTSIDE THE HOME ON NUTRITIONAL STATUS OF 6-59 MONTH-OLD CHILDREN IN BAHIRDAR CITY, AMHARA REGIONAL STATE, ETHIOPIA 2018.

BY: MESFIN TEGEGNE (BSC)

A RESEARCH SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF BAHIR DAR UNIVERSITY IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF THE MASTERS OF PUBLIC HEALTH (EPIDEMIOLOGY)

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SEPTEMBER, 2018

BAHIR DAR ETHIOPIA

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The Association of Maternal Employment status on Nutritional Status of Children,Bahirdar, tanakifleketema.

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LIST OF ACRONYMS

EDHS: Ethiopia Demographic and Health Survey

(HAZ): Height for age Z score

NCHS: National Centers for Health Statistics

PEM: protein energy malnutrition

(WHZ): Weight for height Z score

(WAZ) – Weight for age Z-score

WHO: World Health Organization

ABSTRACT

Back ground: Childhood nutrition is known to have a considerable impact on children's health. In Ethiopia,Inadequate and/or inappropriate dietary intake and infectious diseases are the immediate/direct causes which in turn are related to a number of socio-economic, demographic, child-care, and environmental factors among these factors the relationship between maternal employment status and child nutritional status were not Cleary known the study area therefore; Comprehensive study on the nutritional status and associated factors is needed.

Objective: assess the association of maternal work status outside the home on nutritional status of 6-59 month-old children in Bahirdar City, Amhara regional state, Ethiopia 2018.

Method: Community-based comparative cross-sectional study design with a multistage sampling technique was used to draw a sample of 309 non-employed mothers and 309 employed mothers. A total of 618 study participants were assessed using a structured, pre tested questionnaire. Height/length and weight of children was converted to Z-score of height for age, weight for height and weight for age by using WHO Anthro software. The data were entered using Epi Data version 3.5.1 and analyzed using SPSS version 23. Multinomial Logistic regression was done for the final models that shows significant effect at p value <0.05 Comparisons Between working and non-working mothers.

Result: The overall result revealed that the prevalence of wasting was sixty-one (9.80 %), of which Forty-nine (7.90%) and twelve (1.90%) were moderately and severely wasted respectively. Seventy-six (12.33%) were underweight, of these, sixty-nine (11.2%) and seven (1.13%) were moderately and severely underweight respectively. on the other hands one hundred fifty four (24.91%) were stunted of which one hundred three (16.66%) and fifty one(8.25%)were moderately and severely stunted. There was no statistically significant association between working status of the mother and nutritional status of their children. However, stunting was influenced by maternal education, total duration of breast feeding, number of under five children, maternal bank saving account, maternal knowledge on breast and complementary feeding and household monthly income.

Conclusion: there was no statistically significant difference in child nutritional status among children of working and non-working mothers. Thus, nutritional intervention initiatives should focus on improving household food security, maternal education, knowledge on breast and complementary feeding and household monthly income.

1. INTRODUCTION

1.1 Background

Malnutrition means “badly nourished” but it is more than a measure of what we eat, or fail to eat. Clinically, malnutrition is characterized by inadequate intake of protein, energy, and micronutrients and by frequent infections or disease. Nutritional status is the result of the complex interaction between the food we eat, our overall state of health, and the environment in which we live – in short, food, health and caring, the three “pillars of well-being.”(1)

Malnutrition is the basis of such human health at all ages. Children particularly, need appropriate nutrition and protein to meet their needs for energy, cell growth and development. One of the greatest threats of child survival and development in recent years is malnutrition. Children in preschool stage requires most attention, at this is the period of rapid growth and development, which makes them highly vulnerable to malnutrition. Malnutrition in this stage has far reaching consequences on child’s future by severely affecting child’s physical and mental development n estimated 45 percent of deaths of children under age 5 are linked to malnutrition. Malnutrition and diet are now the largest risk factors responsible for the global burden of disease by far.(2).

In Nigeria, 37 per cent of children, or 6 million children, are stunted (chronically malnourished or low height for age), more than half of them severely. In addition, 18 percent of children suffer from wasting (acutely malnourished or low weight for height), half of them severely. Twenty-nine per cent of children are underweight (both acutely and chronically mal nourished or low weight for age), almost half of them severely affected.(3)

The 2016 EDHS estimated that 38 percent of children under 5 are considered short for their age or stunted (below -2 SD), 10% are wasted, 24% are under weight and 18 percent are severely stunted (below -3 SD). after being fairly stable in the first 6-8 months of life, the prevalence of stunting increases steadily from age 9 months through the first 4 years of life, before declining slightly in the fourth year of life. Children age 24-35 months have the highest proportion of stunting (48 percent). Stunting is slightly higher among male than female children (41 percent versus 35percent).(4)

While women's labor force participation tends to increase with economic development, the relationship is not straightforward or consistent at the country level. There is considerably more variation across developing countries in labor force participation by women than by men. This variation is driven by a wide variety of economic and social factors, which include economic growth, education, and social norms.(5)

African women, produce as much as 80% of the food, and supplement family income by working in the formal and informal sectors as traders and producers. In Ethiopia, in the rural area 85% of the women involved in agricultural work, while in the urban areas due to various social crises as well as rural urban migration, about 35% of urban dwellers are women. This huge work force was forced to engage in low skills, education and inability to compete with their male counter parts.(6)

In this modern era, most mothers have become part of the labor force compared to previous time. Maternal employment influence child feeding practices thus it reflects child nutrition status. Mothers exert strong influence over child feeding practices.(7)

1.2 Statement of the Problem.

Malnutrition is clearly a major contributing factor to child mortality, disease and disability. For example, a severely stunted child faces a four times higher risk of dying, and a severely wasted child is at a nine times higher risk. Specific nutritional deficiencies such as vitamin A, iron or zinc deficiency also increase risk of death. Under nutrition can cause various diseases such as blindness due to vitamin A deficiency and neural tube defects due to folic acid deficiency.(8)

Malnutrition in all its forms either directly or indirectly is responsible for approximately half of all deaths worldwide. This applies to perinatal and infectious diseases as well as chronic diseases. Malnutrition accounts for 11% of the global burden of disease, leading to long-term poor health and disability and poor educational and developmental outcomes. Worldwide, by 2010 it was found that about 104 million children under five years of age were underweight and 171 million stunted. At the same time, it was found that about 43 million children under five were overweight or obese. About 90% of stunted children live in 36 countries and children under two years of age are most affected by under nutrition.(9)

Trend in the proportion of children the prevalence of stunted and underweight over the three EDHS surveys is decreased. The prevalence of wasting in Ethiopia has remained constant over the last 11 years. Even though the prevalence was deceased; it continues a major health problem yet.(10)

There is a general consensus today that a complex set of causes determines malnutrition. Inadequate and/or inappropriate dietary intake and infectious diseases are the immediate/ direct causes, while these in turn are related to a number of socio-economic and environmental factors, such as environmental sanitation, water supplies and primary health care, and family factors such as the presence of other family members, type of housing, availability of water, household hygiene, mother's education, infant-feeding practices, decision-making power and maternal work status(11)

1.3 justification of the study

Malnutrition is one of the main health problems in Amhara National Regional State. According to EDHS 2011 reports shows, Malnutrition in Amhara National Regional State is found higher than the national average, associated factors were not clearly known in the study area. Comprehensive study on the nutritional status and associated factors is needed.

The prevalence of malnutrition in Ethiopia is relatively well documented, but not specific to the regions, localities and residence so far. It is also vary among regions, localities and residence and limited data is available in study area.

Economic theory suggests that families in which mothers work outside the home must trade off the advantages of greater income against the disadvantages of less time for home food production and supervision of children's activities. This trade off may result in positive, negative, or no net impacts on children's nutritional well-being.(12)

First, the mother's increased income, and, second, the time taken away from child cares, when she goes to work, will be associated with her employment. While one of the effects is direct and positive, the other is inverse and negative. Maternal employment usually results in a loss of childcare time; presumably the mother is therefore less available for breast feeding and making frequent meals, etc., however, it is possible those non-working mothers also spend relatively little time in child care, or that important care giving behaviors continue to be performed if there are adequate substitute care takers.(13)

1.4 Significant of the study

From the result of the study, Both kifleketemas administrators may be guided on what should be emphasized by health workers on the mothers having under-five children to improve nutritional status of the children and also the mothers having under-five children gives special attention on potential variables which has an effect in child nutritional status.

I will contribute some to find out whether the well-being of children is affected more by the time constraints of women who perform the dual role of mother, or by the increased income generated by the mother's working. Also it is helpful in producing applicable recommendations that will show more areas of intervention programs to both governments and non-government organizations to improve the health and nutritional status of children. And also used as a reference in priority setting and designing effective nutritional programs.

2. LITERATURE REVIEW

Nutrient deficiencies and malnutrition

Result from southern Ethiopia revealed that the prevalence of stunting was 22.2%, of which 21.8% and 22.6% were in children of employed and unemployed mothers, respectively. Low-weight-for age was 10.8% for children of employed mothers and 13.4% for children of unemployed mothers. Wasting was 8.8% and 10.8% for children of employed and unemployed mothers, respectively. There was no statistically significant association between maternal employment and nutritional status of their children. Welayta, Ethiopia. Stunting was insignificantly associated with maternal employment and maternal age. However, stunting appeared to be significantly influenced by maternal education, child age and household wealth. Children of literate mothers were 63% less likely to be stunted as compared to children of illiterate mothers. (5)

The study showed in Nicaragua, The nutritional status of children whose mothers were working for earnings was compared to those of Non-working mothers using t-tests. Children of working mothers had significantly higher WH than those of Non-working mothers. This result was found even controlling for the confounding variables of maternal differentiation, household wealth, and child gender. (16)

Results from the study at the Kindergartens in Selangor, Malaysia indicated that There is a significant positive fair correlation between child BMI and length of working hours. However, the correlation of length of working hour and child's height did not reach statistical significant which indicated. (17)

Results from Ethiopian Somali regional state, bivariate analysis showed that family size, immunization status, maternal education, monthly income, extra feeding during pregnancy/ lactation, ANC visit, continuation of breast feeding, birth order, how long breast feed after birth and availability of latrine have significant association to wasting. Children from large family size were 2.0 times more likely to be wasted than children from small family size, children from households having monthly income of less than 750 birr were 1.8 times more likely to be wasted than children from households having monthly income of less than 750 birr, non-immunized children were 7.6 times more likely to be wasted than their counter parts and female were 1.5 times more wasted than boys. (18)

The result of study done at Babban-Dodo community Zaria city, Northwest Nigeria It was found that there was significant difference, with regard to stunting, between the children whose mothers were literate and had formal education and those whose mothers had no formal education, but no significance was found between the two groups as regards underweight and wasting. (19)

Findings from the Malawi DHS Survey, Poor sanitation puts young children at risk of increased illness, in particular diarrheal diseases, which adversely affect a child's nutritional status. Both inadequate food intake and poor environmental sanitation reflect underlying social and economic conditions poor environmental sanitation reflect underlying social and economic conditions. (20)

The study conducted to Bangladesh, displays, the bivariate analyses of malnourished children by order of birth and other variables of interest. Children of third order, fourth order, fifth and higher birth order are 19%, 36% and 78%, respectively, more likely to be stunted than children of first order birth. Furthermore, maternal education, household wealth and maternal access to media are also significantly negatively associated with children being stunted. (21)

Results from the study of Guatemala, Characteristics of mother's income earning that might be associated with anthropometric status where her income per month, the percent of the family's income she earned, and the total number of hours she had worked in the previous year. The woman's income per month was correlated with both height for age and weight for age, whereas the mother's percent of family income earned was related. (22)

Results from Oyo, Nigeria showed that, Mother's education seemed to play a protective role against child's malnutrition. Overall 93% of the mothers literate though up to different levels. Prevalence was highest where mothers were illiterate (52.94%) vs. value of 38.46% where mothers had education more than secondary school. Similarly, stunting were 17.65% where mother was illiterate and 7.69% where education level was more than secondary school. Differences were statistically significant for both cases. Education of mothers significantly influenced the nutritional status of under- five as the prevalence of under nutrition was 52.94% where mothers was illiterate and it was 38.46% where education level was more than secondary school.(23)

Results Found from southern Ethiopia showed that stunting was increased with age of the child. Shorter length of breast feeding also contributed for stunting. Similarly, bottle feeding in the last 24hrs and larger family size predicted stunting. Children whose family size was 5 or above were 3.13 times more stunted than families with less than Children who had mother with age less than 21 years old age were 2.11 times more exposed to stunting than their counter parts . Children whose fathers attended below grade 8 were 6.52 times more vulnerable to stunting compared to their counters. (24)

The study conducted at Uganda for birth order, stunting was highest among children of birth order 1–4 than those of order 5 and above. Children of birth order 3–4 were more wasted than those of birth order 1–2 or 5+. Similarly, underweight was highest among children of birth order 3–4. on the birth interval, stunting was highest among under five children with birth interval of 3–4 years. (25)

The study Bangladesh showed that malnutrition status was diminished with the length of previous birth interval. Births that larger in size at birth had lower risk of malnutrition than those who were very small in size at birth. Children of illiterate mother were 52.6 percent stunted, 12.2 percent wasted and 55.7 percent under weighted. These proportions dropped drastically among children whose mothers attended secondary or high level of education. The rate of under-five malnutrition were decreased as the educational level of the father increased. (26)

Result from Nigeria, There was a significant association between timely introduction of solids with the nutritional status indicator wasting. Wasting was observed to be more prevalent (39.1%) among children who did not receive timely solid, semi-solid or soft foods compared with children who received solid, semi-solid or soft foods (24.4%).(27)

The study conducted in India, Significant association was found with immunization status of the pre-school children with underweight and stunting rates ($p<0.05$). Vaccination provides protection against morbidity and this in long run improves nutrition status as repeated illness leads to deterioration of health. (28)

The current findings in India also indicate a significant association between maternal literacy status and children's nutritional status as indicated by Height for Age. Total 78% severely stunted and 35.2% moderately stunted children were found in case of illiterate mothers. The percentage of stunting among children was also high (16% severely

stunted, 16% moderately stunted) in case of mothers educated up to primary level. The percentage of stunting in children was gradually decreased in case of mothers who were educated up to secondary level and graduation or post-graduation there by maternal nutritional knowledge score were also found strongly associated with their children's nutritional status as indicated by Height for Age.(29)

Result from the study in Nepal Mothers exclusively breast feeding for 6 months had only 20.0% low weight for age children compared to those who didn.t had 34.8% . Pregnant ladies who took iron supplements had 20.5% of low weight for age children compared to in those who didn.t take supplements (30)

The study conducted in Ethiopia, Discontinuation of breastfeeding before 24 months of age was seen in 30.8% of the cases and in 8.8% of the controls. Lack of exclusive breastfeeding for the first 6 months of age was more common in the cases 48.0%) than in the controls 23.5% There was a significant association between delay in time of breastfeeding initiation after childbirth and stunting (31)

The study conducted in Tanzania, women's decision-making power has a stronger effect on child nutritional status in poorer household than in richer ones, because influencing decisions over the allocation of resources is more important when those resources are scarce in number (32)

The study revealed in Nigeria and Kenya that Children who were breastfed for more than 12 months were less likely to be stunted when compared with children breastfed for less than 12 months (34) There was a significant association between continuing breastfeeding 24 months and child malnutrition. Children who had discontinued breastfeeding were more than four times likely to be underweight compared to those continuing breastfeeding.(33)

Result from Mozambique showed that Children living in households with other family members and living in households with other children less than five years of age were more likely to develop stunting. (34)

Maternal work status and child nutritional status, Conceptual framework

In this model (Fig. 1) we were divided variables into 3 groups: Distal factors were indicated by the socioeconomic variables (mother's education, mother's occupation and per capita income and maternal saving account) Intermediate factors included house hold size, number of under-five children, birth order, source of drinking water and availability of latrine Proximal factors which included weight at birth, child health status (diarrhea), time of initiation of complementary-feeding, duration of exclusive breast-feeding and child immunization status

According to the conceptual model, socioeconomic factors (the distal determinants) may affect, directly or indirectly, all other groups of risk factors with the exception of gender. These variables, in turn, may affect the nutritional status of children.

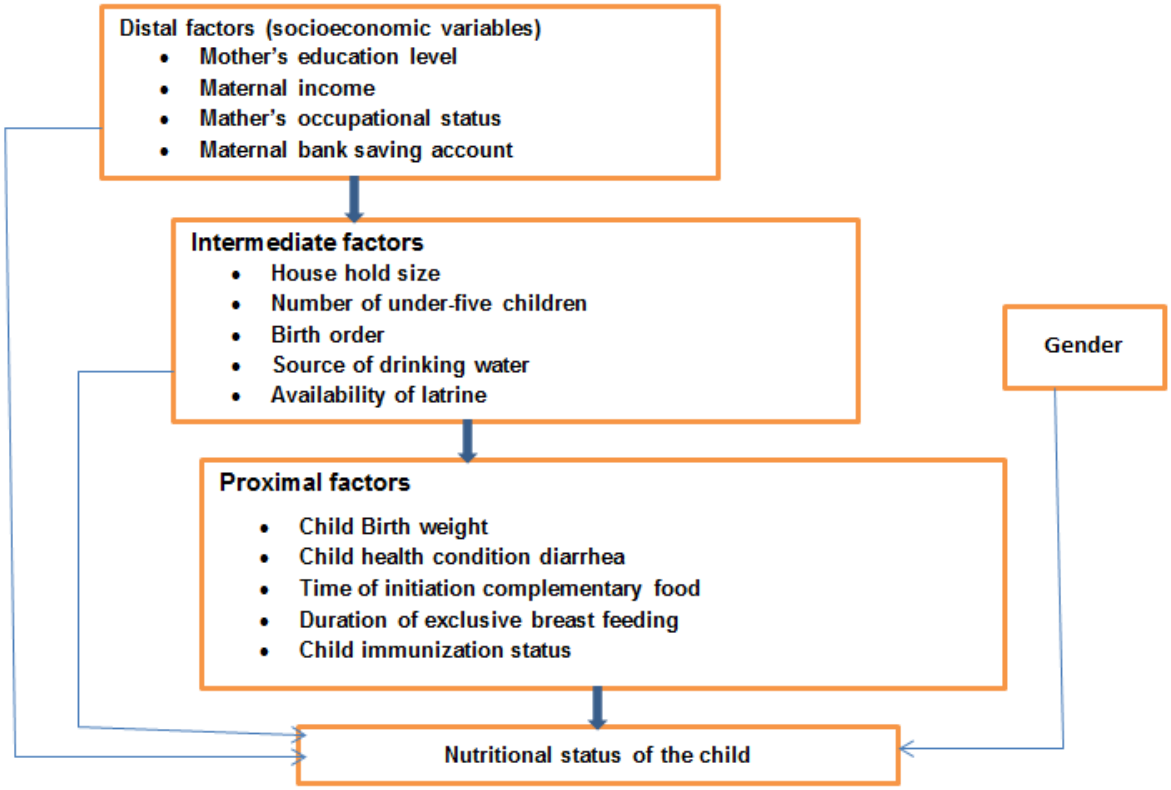

Figure 1. Conceptual framework by identifying the specific variables described in the literature and figure out how these are variables are related each other

3. OBJECTIVES:

3.1. General objective

To assess the association of maternal work status outside the home on nutritional status of 6-59 month-old children in Bahirdar city,Amhara Regional State

3.2. Specific objective:

1. To compare the state of malnutrition (stunting, wasting and underweight) of 6-59 month-old children between working and non-working mothers.
2. To identify factors influencing the nutritional status among children aged 6-59 months.

4. METHOD AND MATERIALS

4.1. Study Area: The study was conducted in Bahir Dar town, Tana and Fasilo kifleketema. the study town is 565 KM south west of Addis Abeba capital city of Ethiopia. both Tana and Fasilo kifleketema's contains 4275 and 2009 households and have a total population of 26,516 and 20,277 respectively, of which 13,311 and 10,179 are males, 13,205 and 10,098 are females respectively. Children from 6-59 months –old age lived in tana and fasilo kifleketema are estimated to be 3415 and 2612 respectively. the average number of Persons per household is 3. Six medium private clinic and one governmental health center are found those kifleketema. 2% of the households use open defecation, while the remaining use shared pit latrines and private toilet facility.(36)

4.2. Study Design and period: community based comparative cross sectional Study was conducted from January to May 2018

4.3. Source population

4.3.1. All working and non- working mothers with children from 6-59 month –old age lived in Bahir Dar city.

4.4. Study Population

4.4.1. All working and Non-working mothers with children from 6-59 month –old age lived in Tana and Fasilo kifleketema.

4.5. Eligibility criteria

4.5.1. Inclusion criteria:

- Working mother might be working either full time or part time.
- Working mother should be working from at least the last 6 months.
- non- working women should not be working from at least the last 6 months

4.5.2 Exclusion criteria

- Child and mother lived separately will be excluded from the study.
- A child who had edema of both feet.

Operational Definition

1. Working mother - A mother is considered to be a " working mother" if she reports earning income at least for the last six months by working either in government, NGO, public, private sector, or earnings is based on self – managed income-generating work including, Street vending mothers, semiskilled mothers, informal occupation, fixed market vending, technical and professional working mothers.(number of days mother work per week, hours per day mother works, length of working station and generated income were considered.(35)

2. Non – working mother:- A mother is considered to be "non-working mother "if she reports she is not working at least for the last six months and dependent on someone else for earnings (these include, house-wives, and others, etc). (It is assumed that, a six months gap in maternal working status is ideally to show any significant difference in nutritional status of children). (35**)**

3. Childcare substitute: - refers to a type of arrangements to care for child when the mother is away for work.

4. Caregiver: - is the most responsible person that provides child care when the mother is out of home for work.

5. Stunting (HAZ):- Height for age Z score < -2SD of the NCHS reference. It normally measures long-term under nutrition.

6. Wasting (WHZ):- weight for height Z score < -2SD of the NCHS reference. It reflects acute malnutrition.

7. Underweight (WAZ):-Weight for age Z-score < -2SD of the NCHS reference. It tends to assess both chronic and acute malnutrition.

8. normal/nourished:-Z score $\geq$ -2SD of the NCHS reference

9. Good knowledge: - Individuals was judged to have good knowledge, they were responding >=60% of knowledge questions. (37)

10. Moderate knowledge: - Individuals was judged to have moderate knowledge they should answered 50-60% of the knowledge questions.(37)

11. Poor knowledge: - Individuals was judged to have poor knowledge they should answered <50% of the knowledge questions.(37)

4.6. Sample size calculation: by using open epi version 7.1, among exposure variables, educational status of the mother is chosen as main exposure. In this regard, the prevalence of stunting child for working mother, Statistical power, ratio of unexposed to exposed, percent of outcome in unexposed group, percent of outcome in exposed group, odds ratio.(ref.16) and 95 percent confidence interval (CI) were used to select a total sample size of 636. According to the calculated optimal sample size, 318 working mothers and 318 non-working mothers with a child of 6 to 59 months old were selected randomly.

4.7. Sampling Procedure: Multistage sampling technique was employed. First two kifleketema selected by lottery method. Whole mothers lived B and D1 zone in Tana kifleketema, 3B and 15D zones in Fasilo kifleketema were enumerated in order to identify working and non-working mothers. Therefore total non-working and working mothers with 6-59 month's old age children were identified. This was used as a sampling frame to identify the required sample size. Then mothers with 6-59 months old age children were selected using a systematic random sampling method. For the family that had more than one child with in this age one child was selected as Lottery method. Data were collected between January to May 2018.

SCHEMATIC PRESENTATION OF SAMPLING PROCEDURE

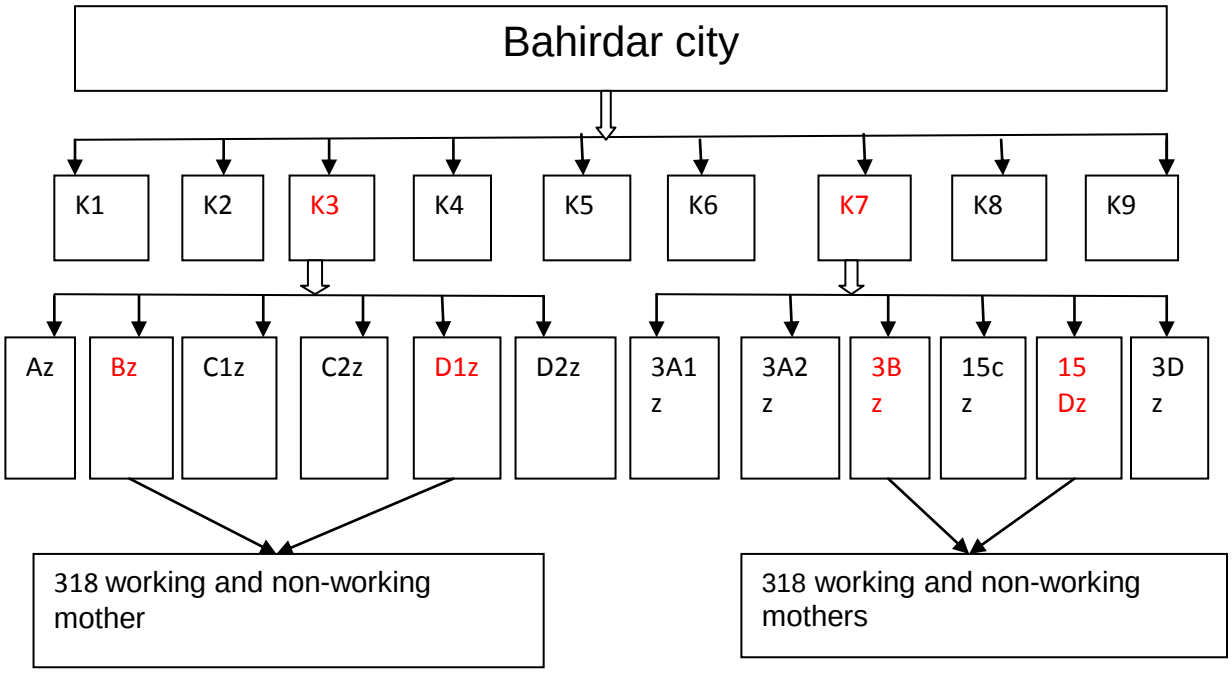

Figure.2 schematic representation of sampling procedures
Key (k1-k9 are kifleketemas) and (A up to 3D are zones)

K3-Tana kifleketema

K7-Fasilo kifleketema

4.9. Tools for data collection: Structured and pre-tested questionnaire was used to obtain information on demographic, social, behavioral and economic factors, and information on anthropometric indices were also collected using weighing scale and height measuring board.

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 Depending on a child's age and ability to stand, measure the child's length or height. A child's length was measured lying down (recumbent) and height was measured with standing position using height measuring instrument with precision of 0.1 cm. The steps were repeated three times for to get an average of three readings. The readings was taken to the nearest 0.1 kg and 0.1c.m respectively after obtaining a written consent from the mothers

4.10. Data quality

Six data collectors, (three nurses and three assistants), two supervisors and the principal investigator were involved in data collection process. The data collectors and the supervisors were trained for two days on data collection technique, particularly in the proper filling of questionnaire, and the use of the weight and height scales and how to measure. The data collection instrument was pre-tested with a 10% of sample population in adjacent kebeles in order to assure whether the instrument is efficient enough to meet the objective of the study or not. Based on the feedback obtained from the pre-test, the questionnaire was reviewed. The data collection process was closely monitored by supervisors and the principal investigator. The completeness and consistency of the data was checked before the study participant leaves.

4.11. Data processing and analysis

The weights and heights/lengths of children were converted to z-scores of height-for-age, weight-for-height and weight-for-age based on the WHO 2006 multi-center growth reference data using the computer program WHO Anthro version 3.2.2. the data in which The child's age, weight, oedema status (yes/no), length/height and type of measurement (recumbent or standing) were exported from SPSS into Microsoft excel and those data were again exported to WHO Anthro software, finally those data were exported back into SPSS

Data were categorized and coded on prepared coding sheet by the principal investigator. Then data were entered and analyzed using EPI-INFO version 7.0 computer statistical package and analysis was done using SPSS version 23.0

Descriptive statistics were computed for all variables according to type, Frequency, mean and standard deviation was produced for continuous variables while categorical variables were assessed by computing frequencies and proportions

Multinomial Logistic regression was done for the final models that shows significant effect at p value <0.05 Comparisons Between working and non-working mothers. the overall fit, the classification accuracy of the model, The likelihood ratio test, pseudo r square and the Chi-Square goodness of fit test were used to assess the appropriateness, adequacy and usefulness of the model multicollinearity was assessed by using a variance inflation factor. Results with variance inflation factor greater than ten and less than one were excluded from the analysis.

4.12. Ethical clearance

Before data collection, Ethical clearance was obtained from school of public health, college of medicine and health Sciences College of Bahir Dar University. The local authorities were informed about the purpose of the study and its objectives. Prior to entry into the study, the mothers were asked consent after explaining the benefits of the study to them.

5. RESULTS

5.1 Socio-demographic characteristics

Six hundred thirty eight mothers having children aged 6-59 months old age were planned to be included in this study.. Out of these, six hundred eighteen were enrolled in the data collection which gives a response rate of 97.16%.The age of respondents ranged from 20-46 years, the mean (SD) ages of the respondents were 29.13(5.36) and 28.74(5.09) years working and non-working mothers respectively, among the study participants, three hundred nine (50%) mothers with children aged 6-59 months old age were working mothers the rest three hundred nine (50%) mothers with children aged 6-59 months old age were non-working mothers. with this regard, one hundred thirty four(21.6%) were government employee, one hundred(16.2%) were self-employee, thirty-seven(6%) were NGO employee, the rest of three hundred nine (50%) of the respondent had no work

Seventy-six (12.3%) of the respondents were able only read and write, of which, thirty-five(5.66%) and forty-one(6.63%) were working and non- working mothers respectively while one hundred seventeen (18.93%) had primary education, of which, seventy-five(12.13%) and forty-two(6.7%) were working and non-working mothers respectively. one hundred forty-nine (24.1%) had attended secondary education of which, eighty-four(13.59%) and sixty-five(10.51%)were working and non-working mothers respectively. the remaining two hundred seventy-six (44.6%) had attended higher education of which, one hundred fifteen(18.6%) were working mothers and one hundred sixty-one(26.05%) were non-working mothers. From the total number of respondents, fife hundred thirty three (86.24%) were married, thirty four (5.5%) were divorced and the rest fifty one (8.25 %) were widowed.

Table 1: Socio-demographic characteristics of study participants (n=618), Bahir Dar Town, February 2018

Variables		Maternal Working status	
		Working	Non-working
Mean(SD)			
Child age in months		30.00±13.00	28.03±12.32
Maternal age in years		29.01±5.16	30.18±4.58
Marital status	Married	274(44.33%)	259(41.9%)
	divorced	16(2.58%)	18(2.91%)
	widow	19(3.0%)	32(5.1%)
Mother educational status	Read and write only	35(5.66%)	41(6.63%)
	primary	75(12.13%)	42(6.7%)
	secondary	84(13.59%)	65(10.51%)
	higher education	115(18.6%)	161(26.05%)
Monthly income	< 2000birr	89(14.4%)	62(10.03%)
	2000-5000birr	90(14.56%)	44(7.11%)
	> 5000 birr	176(28.47%)	157(25.4%)
Family size	<5	133(21.52%)	138(22.33%)
	≥ 5	176(28.47%	171(27.66%)
Number of under-five aged children	≤ 2	209(33.81%)	210(33.98)
	> 2	100(16.18%)	99(16.01%)

5.2 Child feeding pattern and health seeking behaviors: About five hundred twenty three (84.62%) of the respondents had breastfed their child, of which two hundred fifty nine (41.9%) were working mothers and two hundred sixty four (42.71%) were non-working mothers. No mother reported that she had started additional food to her child immediately after birth. However, three hundred ninety-two (62.81%) of the mothers started complementary food to their children at the age of 6 months; of these, one hundred ninety-two (49.23%) were working mothers and two hundred (32.36%) were non-working mothers. Fourteen (2.2%) mothers started additional food to their children after 6 months of age. Of these, six (0.97%) mothers were working mothers, while two-hundred twelve (34.30%) of them started additional food to the children before 6 months of age after birth. Of these, one hundred ten (17.79%) mothers were working mothers.

Pertaining to mothers' knowledge about time of initiation of breast and complementary feeding, two hundred thirty fife (30.02%), one hundred sixty eight (27.18%) and two hundred ten (34.78%) had high, average and poor knowledge. of which ninety six (15.53. %), one hundred fourteen (18.44%) and ninety-nine (16.01%) were working mothers respectively.

Among the study participant mothers, one hundred sixty four (26.53%) for fever seeks advice or treatment Of which eighty-nine (14.4%) and seventy-five (12.1%) of mothers working and non-working mothers respectively. and two hundred twenty-one(35.76%) mothers seeks advice or treatment for cough from different public health facilities. of which one hundred twenty five (20.22%) and ninety six (15.53%) of mothers working and non-working mothers respectively

. Concerning the delivery place, five hundred eighty-three (94.33%) of mothers delivered at health institutions. of which three hundred sixty (59.22%) and two hundred seventeen (35.11%) working and non-working mothers respectively. The remaining thirty-five(5.62%) of mothers gave birth at home assisted by Traditional Birth attendants..

Table2: maternal knowledge on breast and complementary feeding and health seeking behavior of the respondents (n=618) Bahir Dar town, January 2018

Variables	Working	Non-working
Mother's Knowledge on breast and complementary Feeding		
poor	99(16.0%)	111(17.96%)
moderate	114(18.44%)	54(8.7%)
high	96(15.53%)	139(22.49%)
Initiation of complementary feeding		
At six months	192(31.06%)	200(32.36%)
After six months	6(0.97%)	8(1.29%)
Less than six months	86(13.91%)	126(20.38%)
Practice of breast feeding		
Yes	259(41.9%)	264(42.71%)
no	56(9.06%)	39(6.31%)
Place of delivery		
Home	12(1.9%)	23(3.72%)
Health facility	366(59.22%)	217(35.11%)
Children weight at birth		
Normal birth weight	318(51.45%)	213(34.46%)
Low birth weight	23(3.72%)	36(5.82%)
High birth weight	20(3.23%)	8(1.29%)
Seeking advice or treatment for sickness		
Fever	89(14.4%)	75(12.1%)
Cough	125(20.22%)	96(15.53%)

5.3 Nutritional status description: sixty-nine (11.2%) of the children were moderately underweight and twelve (1.9%) of the children were severely underweight. On the other hands forty-nine (7.9%) of the children were moderately wasted, seven (1.13%) of the children were severely wasted. one hundred-three (16.66%) were moderately stunted and fifty-one (8.25%) of the children were severely stunted.

The presence of a relationship between the dependent variable and combination of independent variables is based on the statistical significance of the final model. "Model Fitting Information" In this analysis, the probability of the model chi-square of wasting (12.505) was 0.130 and the model of chi square of underweight (8.225) was 0.412.both values were greater than the level of significance of The null hypothesis is that there was no difference between the model without independent variables and the model with independent variables was accepted. The Pearson value of goodness of fit of wasting and underweight was greater than 0.05, then the models of two variables were not fit based on these findings. The model of wasting and underweight which was developing is not good. The existence of a relationship between the independent variables and the dependent variable was not supported. Then the final models were not fit. Therefore,I did not need to go further analysis.

The possible reason could be potential predictors might not be included the study or could be low prevalent or the sample size could be low for this research.

Table 3:Anthropometric characteristics of children age of 6-59 months of age in Bahirdar city Amhara region, Ethiopia January 2018

Variables	Respondents	
	Frequency(n)	Percent (%)
Weight- for height- Z score		
Normal(≥-2SD)	562	90.93
Moderately wasted(<=-2to>-3 SD)	49	7.9
Severely Wasted (<-3SD)	7	1.13
Height-for-age-Z score		
Normal(≥-2SD)	464	75.08
Moderately stunted (<=-2to>-3SD)	103	16.66
Severely stunted (<-3 SD)	51	8.25
Weight- for age- Z score		
normal(>-2SD)	537	86.89
Moderately underweight(<=-2 to>-3 SD)	69	11.2
Severely Under-weight (<-3SD)	12	1.9

5.4 Factors influencing the nutritional status of children:

As shown in Table 4, stunting appeared to be significantly associated by maternal education, monthly income, maternal bank saving account, maternal knowledge on breast and complementary feeding, number of under five children and total duration of breast feeding. However, maternal working status was not statistically associated with child nutritional status

Moderately Stunted: moderately Stunting was found to be associated with maternal education, bank saving account, duration of breast feeding, monthly income, maternal knowledge on breast and complementary feeding. from the outcomes, moderately stunted compared to normal. Increasing level of maternal education is a protective factor against stunting. Children of mothers who attended college level and above were compared to illiterate mothers less likely to be moderately stunted compared to nourished, Odds Ratio (OR = 0.136) (95% CI .036 to 0.521), p=0.041

Regarding to bank saving account, the outcome of “moderately stunting” compared to “normal” children from mothers who had bank saving account compared to had no saving account were less likely to be “moderately stunted”, compared to normal, Odds Ratio (OR) =0.364 (95% CI 0.101 to 0.324), p=0.039.

Total recommended duration of breast feeding is a protective factor against to be moderately stunted, “moderately stunted compared to normal” among children who had breast feeding for more than or equal to two year compared to the children who had breast feeding for less than two year were less likely to be moderately stunted compared to nourished, Odds Ratio (OR) =.029 (95% CI 0.014 to 0.59), p=0.000. concerning to monthly income, children from parents who had relatively high amount of monthly income(more than 5000birr) compared to children from parents who had relatively less amount of monthly income (less than 2000 birr), were less prone to be moderately stunted compared to nourished, Odds Ratio (OR) =0.033 (95% CI 0.01 to 0.110), p=0.000.

regarding to maternal knowledge on breast and complementary feeding, the outcome of “moderately stunting” compared to “normal” children from mothers who had relatively high knowledge on breast and complementary feeding compared to children from

mothers who had relatively poor knowledge on breast and complementary feeding were less likely to be moderately stunted, OR =0.026 (95% CI 0.004 to 0.174), p=0.000.

“Moderately stunting” compared to normal” Children from parents who had two or less than under five children were less likely to be moderately stunted compared to normal. OR =0.105 (95% CI 0.045 to 0.245), p=0.000.

Severely Stunted: severely Stunting appeared and influenced by maternal education, bank saving account, total number of under five children, total duration of breast feeding, monthly income, maternal knowledge on breast and complementary feeding. Increasing level of maternal education is a protective factor against severely stunting. Children of mothers who attended college level and above were compared to illiterate mothers less likely to be severely stunted compared to normal, Odds Ratio (OR = 0.127) (95% CI .026 to 0.625), p=0.011.

Regarding to bank saving account, the outcome of “severely stunting” compared to “normal” – children from mothers who had bank saving account compared to had no saving account were less likely to be “severely stunted”, compared to normal, Odds Ratio (OR) =0.003 (95% CI 0.001 to 0.016), p=0.000.

total duration of breast feeding is a protective factor against to be severely stunted, severely stunted among children who had breast feeding for more than one year compared to the children who had breast feeding for less than one year were less likely to be severely stunted compared to normal, Odds Ratio (OR) =.031 (95% CI 0.005 to 0.176), p=0.000.

concerning to monthly income, children from households having relatively high amount of monthly income more than 5000 birr compared to children from households having of less than 2000 were less prone to be severely stunted compared to normal ,Odds Ratio (OR) =0.094 (95% CI 0.011 to 0.776), p=0.028.

regarding to maternal knowledge on breast and complementary feeding, the outcome of “severely stunting” compared to “normal” children from mothers who had relatively high knowledge on breast and complementary feeding compared to children from mothers who had relatively poor knowledge on breast and complementary feeding were less likely to be severely stunted, OR =0.010 (95% CI 0.001 to 0.128), p=0.000.

“Severely stunting” compared to “normal” Children from parents who had two or less than under- five children compared to Children from parents having more than two under five children were less likely to be severely stunted compared to normal. OR =0.216 (95% CI 0.068 to 0.689), p=0.01

Regarding to maternal working status, the child of working mothers were more prone to be “severely stunted-compared to ‘normal”, compared to non-working mothers, OR =1.847 (95% CI 0.644 to 5.302) even though, the association was not statistically significant

Table 4: Predictors of childhood stunting (n=618), Bahir Dar Town, January 2018

		Sig	Adjusted OR with 95 CI
Moderately stunted	intercept	0.000	
	Child from mothers attend college and above	0.004	0.136(0.036,0.521)
	Child from mothers attend 1-12 grade	0.028	.190(0.044,0.834)
	Child from illiterate mothers	.	.
	Child from non-working mothers	.151	2.282(0.739,7.046)
	Child from working mothers	.	.
	Child from mother's revenue >5000birr	.000	.031(0.010,0.110)
	Child from mother's revenue(2000-5000 birr)	.000	.033(0.007,0.135)
	Child from mother's revenue <2000 birr	.	.
	Child from mother's had bank saving account	.039	.364(0.139,0.951)
	Child from mother's had no bank saving account	.	.
	Child from mothers had high knowledge	.000	.020(.004,0.174)
	Child from mothers had moderate knowledge	.000	.026(.003,0.135)
	Child from mothers had poor knowledge	.	.
	Under-five children lived in the household<2	.000	.105(.045,.0245)
	Under-five children lived in the household>2	.	.
	Children who fed of Breast feeding > 1 year	.000	.029(.014,0.059)
	Children who fed of Breast feeding < 1 year	.	.

Severely stunted	**intercept**	**.000**	
	Child from mother's attend college and above	**.011**	**.123(0.026,0.625)**
	Child from mother's attend 1-12th grade	**.021**	**.127(0.021,0.726)**
	Child from illiterate mothers	**.**	**.**
	Child from mother's revenue >5000birr	**.028**	**.094(0.011,0.776)**
	Child from mother's revenue(2000-5000 birr)	**.196**	**.233(0.025,2.121)**
	Child from mother's revenue <2000 birr	**.**	**.**
	Child from mother's had bank saving account	**.000**	**.003(0.001,0.016)**
	Child from mother's had no bank saving account	**.**	**.**
	Child from mothers have high knowledge	**.000**	**.010(.001,0.128)**
	Child from mothers have moderate knowledge	**.000**	**.060(0.000,0.086)**
	Child from mothers have poor knowledge	**.**	**.**
	Under-five children lived in the household<2	**0.01**	**.216(.068,0.689)**
	Under-five children lived in the household>2	**.**	**.**
	Child from non-working mothers	**.254**	**1.847(0.644,5.302)**
	Child from working mothers	**.**	**.**
	Children who fed of Breast feeding > 1 year	**.000**	**.031(.005,0.176)**
	Children who fed of Breast feeding < 1 year	**.**	**.**

Reference category is normal

6. DISCUSSION

The overall result showed that the prevalence of malnutrition was 12.45%, 10.51% and 24.91% for underweight, wasting and stunting, respectively. However, the prevalence of underweight, wasting and stunting were lower than the reported of Malaysia and 2016 EDHS estimated that 24% are under weight, 10% are wasted and 38% of children under 5 are stunted (15), (5) .The differences in the prevalence of malnutrition among children could be attributed to the difference in the method of data collection, sample size, study subjects or may be due to socioeconomic and seasonal variation as compared with the present study.

The analysis showed that children from educated mothers have a lower chance of stunting compared to children of mothers with had no education. The association of maternal education with stunted children in this study is consistent with many of the previous studies on the subject; India (30), Bangladeshi (27), Nicaragua (17) and Ethiopia (20). This consistency might be, Education of women exerts impacts on health and nutritional status of children since it provides the mother with the necessary skills for child care, increases awareness of nutritional needs and preference of modern health facilities as well as change of traditional beliefs about diseases causation.

The study also showed that, total duration of breast feeding is a protective factor against to be stunted; the mothers who gave breast feeding for more than one year compared to the mothers who gave breast feeding for less than one year were less likely to be stunted. the overall prevalence of total duration of breast feeding greater than one year is 65.69%.Similar studies conducted in Somalia region, southern part of Ethiopia, Nigeria and Kenya (19,) (25), (32),(34) and (35) however the prevalence of total duration of breast feeding of these findings was less than this study. The possible reason to refuse breast feed for total recommended time might be; sucking become painful, mothers might fear weaning the baby to solid foods could be impossible and fear of over attachment.

It was also found out that the prevalence of stunting had a significant relationship to monthly income. Stunting was higher among children household having monthly income of less than 2000 birr than those from households having monthly income of greater than 5000 birr. This is in accordance with previous studies conducted in Guatemala

(23), Bangladeshi (27), and as well as in Ethiopia (25) .This association can be explained by mothers who had relatively high amount of monthly income increases, might have a positive impact on children's dietary intake and anthropometry whereas mothers who had relatively less amount of monthly income might have had inadequate access to good nutrition over a long period of time.

The study assessed that an increase in household members has shown a strong negative influence on children weight for height. Children from parents who had two or less than under five children compared to Children from parents having more than two under five children were less likely to be severely stunted compared to normal. It was supported with studies in Nigeria (33) the possible reason for consistency, depletion of resources due to the large family size that decreases dietary intake which deteriorates health conditions and ultimately influences children's nutritional status and survival.

In our study, maternal knowledge on complementary and breast feeding is directly associated with nutritional status of children. Several studies had shown a positive relationship between maternal knowledge on complementary and breast feeding and child nutritional status previous studies conducted in Ethiopia (18), Kenya (34) as well as Malawi (20). This consistency might be, if the mothers who had relatively high knowledge, they might know; the importance of colostrum, recommended time of exclusive breast feeding and total recommended duration of breast feeding.

7. LIMITATION OF THE STUDY

Nutritional assessment is based on various techniques such as clinical examination, anthropometry, biochemical evaluation, and functional assessment, assessment of dietary intake, vital and health statistics and ecological studies. However, this study looked upon only one method namely anthropometrical assessment of nutritional status evaluated as Weight for Age, Height for Age, Weight for Height,. Other methods were not feasible since extensive technical/ medical knowhow would have been required.

This study may be subjected to recall bias on starting of complementary feeding and initiation of breast-feeding. and also Respondent might have not told us real information about their socio-economic and demographic characteristics

8. CONCLUSION

The overall nutritional status of children of working mothers and non-working mothers were compared. Nevertheless, the difference was not statistically significant. Overall, a high prevalence of stunting was observed. that it is a public health concern in the study area. Stunting is significantly influenced by mothers' educational level, monthly household income, maternal bank saving account, maternal knowledge on breast and complementary feeding, total duration of breast feeding and total number of under-five children

9. RECOMMENDATION

Recommendation for Bahirdar city administration

Stunting is significantly influenced by mothers' educational level, monthly household income, maternal bank saving account, total duration of breast feeding and total number of under-five children. Thus, nutritional intervention initiatives should focus on improving maternal income generation as well as empowering the women via education, a need of nutritional education program and family planning so as to address child malnutrition. Comprehensive preventive measures such as strengthening family practices related to under five children feeding pattern via leaflet and other available sources of information to disseminate child nutrition and related information at home. And also the city administration facilitates, woreda health office and NGOs which are engaged in nutrition intervention among host Community should design integrated nutrition programs.

For all banks in Amhara region and Amhara credit and saving institution

Banks and amhara credit and saving institution, which are offering only for mother's annual lottery prize to encourage more deposit and opening saving account and also better to work at higher interest rates and other incentives for mothers.

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Questionnaires

Section one: Respondents Background

No	**Questions**	**Feedback**	**remark**
1	What is your age? (In completed year?)		
2	What is your education status?	1. illiterate 2 .Read and write 3.Primary (1-6) 4.Secondary (7-12) 5.Secondary+ (12+)	
3	What is your marital status?	1. Married and in union 2. Married lived separately 3. Divorced 4. Widow	

		5. Never married 6. No response	
4	What is the main source of Drinking water for members of your household?	1. Piped water 2. Well water 3. Surface water (river, spring) 4. Others	

5	What kind of toilet facility Does your household have?	1. Flush toilet 2. Pit latrine, private 3. Pit latrine, shared 4. No facility / Bush / Field	
6	Does your household have Electricity?	1. Yes 2. No	

7.	What is your occupational status?	1. Government employee 2. Private Sector Employee 3. NGO employee 4. Self employee 5. Daily laborer 6. Vending 7. No work 8. Others, specify	
8	If no work for question number 7, why you are not working?	1.for handling my child 2. Others, specify	
9	Monthly income	1. Less than Birr 2000 2. Birr 20000 - Birr 5000 4. More than Birr 5000 5. Don't Know	
10	Do you have your own saving account?	1.yes 2.no	
11	While you are at home, what do you do in your leisure time?	1. Do hand work (crafting) 2. Listen radio/Watch TV 3. Reading 4. Preparing/Cooking food 5. Care for my child 6. Do nothing 7. Others	

12	Mother ANC attendance during pregnancy of indexed child	1.yes 2.no	
13	Family size in number		
14	Number of under five children		

Section 2: Information on Characteristics of children aged 6-59months

21	What is the age of your child In months ? (Index child)		
22	What is the sex of your child? (Index child)	1. Male 2. Female	
23	birth weight in K.g (Index child)		
24	Place of delivery of your Index child	1. At health facility 2. At home	
25	Who assisted you at delivery of The index child?	1.Health professional 2.Trained Birth Attendant 3.Traditional Birth Attendant 4.Relatives/Friend/Neighbour 5.Others	

26	Birth interval of index child and preceding child in months		
27	What is the Birth order of index child?		

28	Did you ever breast feed Your child?	1.Yes 2. No	
29	If yes for question number 28, for how many months did you breastfeed?	1. ≤ 6 months 2. 7 – 9 months 3. 10 – 12 months 4. More than 12 months	
30	For how long do you think should a child exclusively breast feed in months?		
31	If No for question number 28, what was the replacement?	1.cow milk 2.formula feed 3.other,specify	
31	. At what age do you think that a child should start weaning? in months		
32	Has the child been ill with fever at any time in the last two weeks	1. Yes 2. No	

		3. Don't know	
33	If the answer for 32 is yes, did you seek advice or treatment for the Fever?	1. Yes 2. No	
34	If the answer for question 33 is yes, where did you seek advice/treatment	1.Public Sector 2.Private medical center 3.Traditional Practitioner	
35.	Has the child been ill with cough at any time in the last two weeks?	1. Yes 2. No 3. Don't know	
36	If the answer for question 35 is yes, during a cough, did he/she breathe faster than usual with short, fast breaths?	1. Yes 2. No 3. Don't know	
37	If the answer for 36 is yes, did you seek advice or treatment for the cough?	1. Yes 2. No	
38	If the answer for question number 37 is yes, where did you seek advice/treatment?	1.Public Sector 2.Private medical center 3.Traditional Practitioner	
39	. Is your child vaccinated? (See card)	1.yes 2.no	

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40	.If the answer for question number 39 is yes, what type of Vaccination does he/she take? A) From Card B) Mother's Report	1. BCG only 2. BCG, DPT1, Polio1 3. BCG, DPT1 – 2, Polio1 – 2 4. BCG, DPT1 – 3, Polio1 – 3 5. BCG, DPT1-3, Polio1-3, Meseales	

Section 4: Information on Mother's Work Characteristics

31	Have you taken any job Outside home in the last 6 Months?	1. Yes 2. No	
32	If the answer for question Number 31 is yes, how many hours per day, days per week and		

	months per year of work.		
33	Distance from residence to work station in meter.		
34	(Only for working mothers) Who usually takes care of your child while you are at work / working? or away from home?	1. Leaves with adult care giver 2, Leaves with child <13 years 3, Leaves at child care institution 4. Child is in school 5, Takes with mother to work	

Section 4: Mother's Knowledge on breast feeding and complementary food

41	. Initiation to start complementary feeding	1. less than 6 months 2. at 6 months 3. after 6 months	
42	In addition to breast milk, a child should consume extra food	1. One meal per day 2. two meals per day 3.More than 2 meals per day	

43	Baby should be breast fed	1. 6 times per day 2.10 times per day 3. on mother interest 4. on demand of child	
44	Initiation of breast feeding	1.First hour 2.Within eight hour 3.After 24 hours	
45	Breast feeding should continue for at least	1.one year 2. two years 3.Beyond 2 years	
46 .	What Do you think about colostrums for new baby?	1.good 2. not good 3.i don't know	
47	Interest of Providing colostrums	1.yes 2. no	

Section 5: Decision making in current relationship

51	In your household, who generally decides in purchasing consumable goods?	1. Respondent 2. Husband/partner 3. Both together 4. Others, specify 5. No response	

52	When your child is sick, who decides whether the child is sick enough to be taken for treatment?	1. Respondent 2. Husband/partner 3. Both together 4. Others, specify 5. No response	
53	Who in your household decides whether your children will be enrolled in school, or which school they will attend?	1. Respondent 2. Husband/partner 3. Both together 4. Others, specify 5. No response	

Section 6: Anthropometrics of 6 – 59 months old children

61	Child's Weight in KG. (to the nearest 0.1 kilogram)		
62	Child's Height in centimeters (to the nearest 1cm)		

Declaration form

Declaration

I, the under signed, declared that this is my original work, has never been presented in this or any other University, and that all the resources and materials used for the research, have been fully acknowledged.

Name of the student Mesfin Tegegne

Signature: _____

Date_____

Approval of the advisor (s)

Advisors Name	Signature	Date
1. ----------	_____	_____
2----------	_____	_____