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# Formula Feeding Practice and Associated factors Among Mothers of in-fants Aged Less Than 6 Months in Bahirdar City, Northwest Ethiopia, 2020.

Hamelmal, Azene

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**BAHIR DAR UNIVERSITY**  
**COLLEGE OF MEDICINE & HEALTH SCIENCES**  
**SCHOOL OF PUBLIC HEALTH**  
**DEPARTMENT OF NUTRITION AND DIETETICS**

**FORMULA FEEDING PRACTICE AND ASSOCIATED FACTORS  
AMONG MOTHERS OF INFANTS AGED LESS THAN 6 MONTHS  
IN BAHIRDAR CITY, NORTHWEST ETHIOPIA, 2020.**

**BY**  
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**A THESIS TO BE SUBMITTED TO BAHIR DAR UNIVERSITY COLLEGE OF  
MEDICINE AND HEALTH SCIENCES, SCHOOL OF PUBLIC HEALTH, DE-  
PARTMENT OF NUTRITION AND DIETETICS IN PARTIAL FULFILLMENT  
OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF PUBLIC  
HEALTH IN NUTRITION.**

**JULY, 2020**  
**BAHIR DAR UNIVERSITY**

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Topic	Infant formula feeding practice and associated factors among mothers of infants less than 6 months in BahirDar city, North West Ethiopia.		
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## DECLARATION

This thesis is my original work, has not been presented for a master degree in any other university and that all sources of materials used for the thesis has been duly acknowledged.

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## ACRONYMS AND ABBREVIATIONS

ANC	Ante Natal Care
AF	Artificial Feeding
BMS	Breast Milk Substitute
Ca	Calcium
EPI	Expanded Program of Immunization
Fe	Ferrous/Iron
Km	Kilometer
Mn	Manganese
NGOs	Non-Governmental Organizations
OPD	Out Patient Department
PNC	Post Natal Care
SIDS	Sudden Infant Death Syndrome
SPSS	Statistical Package for Social Science
US	United States
VIF	Variance Inflation Factor
WHO	World Health Organization
Zn	Zinc

## ABSTRACT

**Back ground:** - Even though Breastfeeding for infants and young children provides the ideal food for healthy growth and development, use of infant formula feeding increased worldwide. In developing countries, 1.3 to 1.45 million childhood deaths are attributed to suboptimal breast-feeding practices. There is a limited study that focuses on infant formula feeding practice and associated factors in Ethiopia.

**Objective:** - To assess infant formula feeding practice and associated factors among mothers who visited health facilities for their infants aged less than 6 months of age in Bahir Dar city.

**Methods:** -Institution based cross-sectional study was conducted from March 11 –May 10, 2020. Data were collected from 593 randomly selected mothers with infants under 6 months of age who came to immunization and under 5 OPD services. Interviewer administered structured questionnaire was used to collect the required data. Data were coded and entered to Epi- data version 3.1 and exported to Statistical package for social sciences (SPSS) version 23 for data analysis. Bivariable and multivariable logistic regression analysis were done to predict variables associated to formula feeding practice. Variables with p-value <0.05 in multivariable logistic regression was considered as statistically significant.

**Result:-**The prevalence of infant formula feeding was 25% (95% CI;21.7,28.0).Maternal age group of 25-34 years [AOR=2.388 (95% CI;1.295,4.406)],mothers occupation of private employee [AOR=6.726 (95% CI;2.756,16.413)],government employee [AOR=4.726(95% CI;1.895,8.700)] and merchants [AOR=2.798(95% CI;1.066,7.345)], having positive attitude to infant formula [AOR=2.10(CI;1.09,4.06)] delayed to breast milk initiation after delivery [AOR=3.73(CI;1.504,9.252)],mothers who had $\leq$ 3ANC visits [AOR=2.294(CI;1.317,3.997)] and source of formula milk information from supermarket/pharmacy[AOR=6.57(95% CI;1.48,29.16)] and from families/friends [AOR=2.24(CI;1.024,4.03)] were independent predictors of infant formula feeding practice.

**Conclusion:-** Even though infants aged less than 6 months recommended to exclusively breast feed, one fourth (25% ) of mothers fed infant formula before the age of 6 months in the study area. Therefore, sustained community based infant feeding education is recommended for pregnant and lactating mothers.

**Keywords:** *Bahir Dar City, formula feeding, health facility, infant, practice, Northwest, Ethiopia*

# 1. INTRODUCTION

## 1.1. BACKGROUND

The World Health Organization recommends that babies be exclusively breastfed for their first 6 months of life, and then introduced to complementary foods, with breast milk between the ages of 6 and 23 months(1). Exclusive breastfeeding is basic for child survival and health, because it provides essential, complete and irreplaceable nutrition for a child's growth and development(2). Furthermore, breastfeeding protects mothers against certain types of health problems like bleeding after delivery, ovarian and breast cancer and it delays in the return of pregnancy(3).

In 2012, The World Health Assembly endorsed a Comprehensive implementation plan on maternal, infant and young child nutrition specifying six global nutrition targets for 2025, one of which is to increase the rate of exclusive breastfeeding in the first 6 months up to at least 50% (4). In a country like Ethiopia, where child morbidity and mortality due to diarrhea, and other gastro intestinal and respiratory infections are very high, exclusive breast feeding is the best child feeding option than formula or other feeding practices.

Yet despite all the benefits of exclusive breast feeding, studies indicated that the prevalence and duration of breastfeeding is declining and being replaced by formula-feeding including plain water, butter, fruits juice and other local foods, while colostrum is discarded as unclean(5, 6). According to 2017 WHO report, globally only 40% of mothers exclusively breast fed their infants for 6 months(7). According to 2019 Ethiopia Mini Demographic and Health Survey (EMDHS), only 59% of Ethiopian infants under 6 months of age were exclusively breastfed(8).

Infant formula is a breast milk substitute formulated industrially in accordance with the applicable standards for infants up to six months of age usually prepared for bottle-feeding or cup-feeding from powder or liquid (9). Globally, around two out of five mothers introduced breast milk substitutes (BMS) by the time their baby was 8 weeks old, and most were combining breast milk and BMS before their baby reached 6 months of age (1).

Infant formula is manufactured using modified cows' milk or soya and does not contain any of the protective antimicrobial or bioactive substances (10). Formula supplementation has a number of undesired side effects of which can result in adverse outcomes on the maternal milk supply, on the duration and exclusivity of breastfeeding, and on the infant's health which leads to pneumonia, diarrhea and certain chronic diseases like obesity and diabetes(11). The higher protein

content of artificial baby milk compared to the lower protein content in breast milk is responsible for the increased growth rate and adiposity during the influential period of infancy of formula-fed infants which leads to obesity and related problems (12).

Moreover, formula fed children have an increased risk of long term diseases with an immunological basis, including asthma and other atopic conditions, type 1 diabetes, celiac disease, ulcerative colitis, crohns disease and greater risk of childhood leukemia(2).

Continued and aggressive of breast promotion breast-milk substitutes, declining breastfeeding rates and confused the distinction between breast milk and formula, claims that infant formula is safe, easy to use, and nutritionally complete (13, 14).

## 1.2. Statement of the problem

Globally, 11.6 percent of deaths of children less than 5 years were attributable to suboptimal breast-feeding practices (15). In developing countries, 1.3 million to 1.45 million childhood mortality were attributed to suboptimal breast feeding practices (16). In Ethiopia, sub-optimal breast-feeding practice contributed to 70,000 infant mortality, which accounts for 24% of the total annual infant death (17).

Worldwide, over 68 million children who are not exclusively breastfed consume formula, water, milk, or complementary food in addition to breast milk, often leading to infections in unsafe environments (18). Formula feeding practice has many undesired health effects. Study from developing countries showed that infants who artificially fed were six to ten times more likely to die in the first months of life with diarrhea and pneumonia than infants who fed breast milk, even in situations with adequate hygiene (19).

Babies who exposed to formula and stop breastfeeding early have higher risks of illness, obesity, allergies and sudden infant death syndrome (SIDS) and impairment on child's cognitive development (20, 21). Infants predominantly fed formula were more likely to be obese at later age relative to infants predominantly fed breast milk (22, 23). Alterations of the neonatal gut environment from formula supplementation can be responsible for mucosal inflammation and disease, autoimmunity disorders and allergic conditions in childhood and adulthood (24). Concentrations of the essential elements (Ca, Fe, Zn, Mn and Mo) were significantly higher in most formulas than in breast milk that may be associated with adverse health effects (25).

According to studies, formula feeding increased the risks of adverse health outcomes particularly hospitalization by approximately 1.5-fold and early formula feeding before 6 months results with an increased rate of antibiotic prescription (20, 26-28). In addition to having more illnesses, formula-fed infants cost the health care system resources. Formula feeding is associated with annual economic losses of over US\$ 300 billion worldwide or 0.5% of the world's gross income (29).

Mothers supplement formula milk due to different reasons such as the promotion of breast milk substitutes, personal, social and cultural factors against breast feeding, the struggle many women face to balance work with child care, and lack of support for breast feeding (30).

International Code of marketing calls on countries to stopping the inappropriate marketing of breast-milk substitutes (including infant formula),and the superiority of breastfeeding over formula and the risks of not breastfeeding(31).In Ethiopia Ministry of Health (MoH) established the National Nutrition Programme II(NNPII) and the National Guideline on Infant and Young Child Nutrition to promote optimal feeding and care practices that follow international recommendations(32, 33).

Despite this, formula feeding is practiced significantly. Therefore, providing customized evidence-based support to mothers to decrease personal social and commercial pressures that lead their decision to infant formula feeding is crucial. This study therefore may provide information on infant formula feeding practices and associated factors among mothers of infants less than 6 months age in the study area, BahirDar City.

### **1.3. Significant of the study**

Even though formula feeding is practiced in Ethiopia, prevalence and factors associated with formula feeding practice were not well understood. Therefore, this study will provide important base line information on infant formula feeding practice and associated factors in Bahir Dar city.

The finding of this study will also provide policy makers, implementers; Amhara regional health bureau the city health office and Non-governmental organizations (NGOs) with relevant information for future planning and interventions of appropriate strategies to prevent inappropriate formula feeding practice and to maintain breastfeeding practice.

The study will also provide information to ongoing research efforts on infant and young child feeding.



## 2. LITERATURE REVIEW

### 2.1. Prevalence of Formula Feeding Practice

Globally, nearly two out of five infants were not exclusively breastfed for the recommended 6 months of life due to different reasons(34).

A study done in US and Ireland showed that 31.3% and 81.8% of infants received formula feeding in the first 6 weeks of life (35, 36). Similarly, study done in Cambodia through cross-sectional survey among mothers, consumption of breast milk substitutes was 43.1% among children 0–5 months (37). A survey on postpartum unit conducted in Island, 65% of respondents reported that they supplementing formula with breast feeding for their infant(38).

According to community based cross sectional study done in Nigeria, 28.8% of infants have exposed to formula feeding (39). Exploratory cross-sectional study done in Egypt indicates that higher percentage of infants (76.2%) were artificially feed mixed with breast feeding (40).

Studies carried out in Offa district, Southern Ethiopia, showed that 7.8% of infants younger than 6 months were fed infant formula(41). Similar study conducted in Hawassa to assess infant feeding practice, the prevalence of formula feeding practice among infants aged less than 6 months was 29.6% (42). A community based cross sectional studies conducted in Agaro, Jimma zone and Bishoftu, Oromia region among infants aged less than 6 months showed that the proportion of mothers who feed their baby formula-based feeding was 15.1%, 47.2% and 65% respectively(43-45). Institutional based cross-sectional study done in DireDawa revealed that, the prevalence of infant formula feeding among infants less than 6 months was 21.4% (46). Similarly, studies conducted in Mekelle, and Gondar city, Ethiopia indicated that 68.8% and 12.4% of infants were exposed to formula feeding respectively (47, 48).

## **2.2. Associated factors of formula feeding practice**

### **2.2.1. Maternal socio-demographic factors**

Maternal employment status had influence on infant feeding practice. Mothers who were employed were more likely to give formula milk than non-employed mothers in Cape Coast(49).

According to a study done in Vietnam, using a mixed methods approach, reasons for formula use were employed mothers returning to work have faced the challenge of continued breastfeeding led to formula use (50). Study done in Agaro, Oromia region showed mothers return to work was one of the reasons reported by the mothers who started bottle feeding practice including formula feeding (44).

Studies done in Vietnam, United Arab, Egypt, DireDawa and Jimma, Ethiopia revealed that factors related to mothers like maternal educational status with illiterate, high wealth index and rural resident have significant association with infant formula feeding practice(40, 43, 45,46, 50).

### **2.2.2. Source of infant formula information**

#### **Media advertisement of infant formula**

Inappropriate marketing of breast-milk substitutes continues to undermine efforts to improve breastfeeding rates and duration worldwide. The breast-milk substitutes industry is strong and growing which influence exclusive breast feeding (31).

UNICEF, in its Infant and Young Child Feeding Programming Guide, demonstrates breast feeding rates decrease in line with increases in the frequency of formula milk advertising and the distribution of free samples of infant formula to nursing mothers in hospitals(51). A literature review focusing on low- and middle-income countries revealed that marketing of breast milk substitutes influences social norms by making formula use seem to be extensive, modern, and comparable to or better than breast milk (52).

Study done in Australia using an explorative qualitative design showed, mothers were influenced by information on the formula tin and marketing from formula manufacturers. Their formula feeding practices were also increased by their interpretation of infant cues (22). According to

study done in Hongkong, formula milk is promoted in leading the mothers to believe that formula milk is an appropriate substitute for breast milk (53). According to study done in Nigeria, infant formula advertisement had a significant effect on mothers' choice of infant feeding. Mothers who were exposed to formula advertisement were more likely to practice formula feeding (39).

Mothers used infant formula in hospital through many reasons including, poor infant breast feeding and in hospital formula supplementation were associated with nearly 2-fold greater risk of not fully breast fed in between the first 2 months and nearly 3-fold risk of breastfeeding cessation at two months of age (54). Study revealed that mothers who were received advertisement information and sample of infant formula in the health care facilities, and formula promotion from health care providers were more likely to practice formula feeding (52). A study done in Jigjiga town on formula feeding promotion showed that infant formula promotion prevalence was 41.19% of which the highest source of information was TV 59 (24.8%).

### **Pressure from family/friends**

Families and friends have influence on infant feeding choice. Study in Hong Kong, showed women to be more likely to initiate discussions about infant feeding with family and friends, because healthcare providers are perceived as not being supportive of formula-feeding (53). Similar study showed that family or community pressures was one of the significant factors to introduce formula feeding (52). As study done in Vietnam formula feeding was also perceived by family members as a way to provide rest to the mother after birth (50).

### **2.2.3. Behavior and knowledge related factors**

#### **Perception of insufficient breast milk**

According to studies done in Island, Vietnam, India, Egypt and DireDawa, Ethiopia perception of inadequate milk supply was one of the most common reasons for formula supplementation for their infants. (8,38,40,46,50).

## **Maternal breast-feeding knowledge and attitude towards formula feeding**

A statistically significant higher percentage of artificial feeding was noticed among infants born to mothers who think that formula feeding is better or that formula has a similar quality to breast milk (40). Study done in Jimma zone on infants aged less than 6 months showed that mothers having negative attitude towards formula feeding and sufficient knowledge to breast feeding increases the probability of not formula-feeding by 74% (43). Studies done in Ireland and Egypt showed positive maternal attitude of formula feeding was among the most frequently reported reasons underlying mothers' decision to formula feeding (40, 55).

Study done in Egypt showed, significant higher percentage of formula feeding practice was noticed among infants born to mothers who need own body privacy (40). Women who reported during pregnancy that they were more concerned with their pre pregnancy body shape/weight tended to have shorter exclusive duration compared to those with less concerns(56).

### **2.2.4. Obstetrics related factors**

According to study done in U.S, Egypt and Dire Dawa, statistically significant higher percentage of formula feeding practice was noticed among infants delivered by mothers with caesarean section (38,40,46,57). Women delivering in a private clinic provided their child with breast-milk substitute at 0–5.9 months, which is five times more than women delivering in the public sector(56).

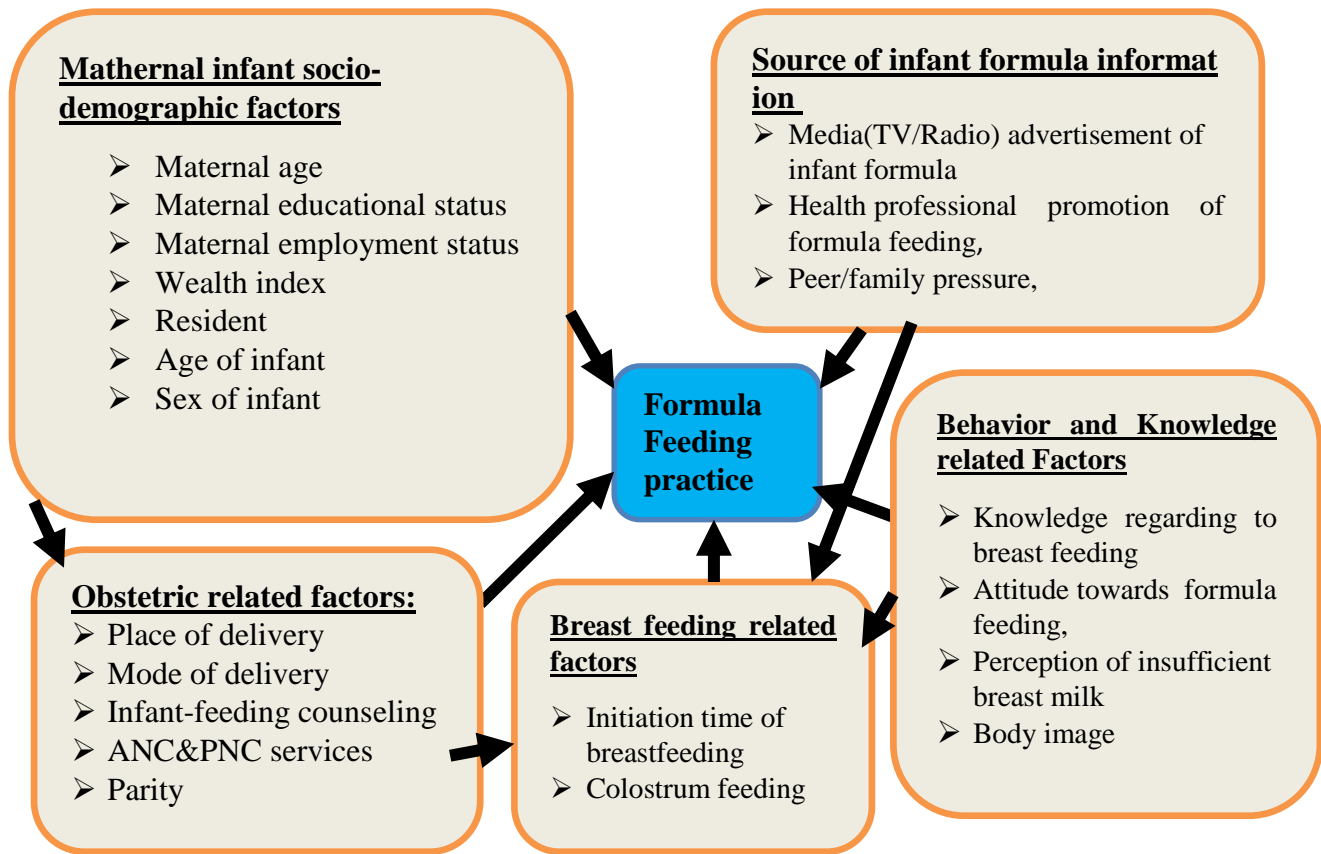
Lack of counseling on breastfeeding benefit and side effect of formula feeding by health professionals increase initiation of infant formula feeding practice. Study done in DireDawa revealed that lack of counseling during ANC follow-up heavily influence initiation of infant formula feeding(46). According to study done in Sorro District, Southern Ethiopia, no antenatal care visit during their pregnancy and no postnatal care visit after delivery were significantly associated with non-exclusive breastfeeding (58). Study showed that multiparty was also significantly associated with formula feeding practice (38).

### **2.2.5. Breast feeding related factors**

Study revealed that initiation of breastfeeding after 1 h of birth and colostrum feeding were significantly associated with non-exclusive breastfeeding (58).

Generally literatures revealed that infant formula feeding is highly practiced in the world as well as in Ethiopia due to different reasons of social, environmental and economic conditions across the studies. So customized study is mandatory for evidence based planning and interventions in the study area.

### 2.3. Conceptual Frame Work



**Figure1:** Conceptual framework indicating associated factors for formula feeding adapted from literatures (43, 46, 59)

### **3. OBJECTIVES**

#### **3.1. General objective**

To assess infant formula feeding practice and associated factors among mothers who visited health facilities for immunization and under five OPD services for infants aged under 6 months in Bahir Dar city, Northwest, Ethiopia, 2020.

#### **3.2. Specific objectives**

- To estimate the prevalence of infant formula feeding practice among mothers of infants less than 6 months of age who visited health facilities in Bahir Dar city Northwest Ethiopia, 2020.
- To assess factors associated with infant formula feeding practice among mothers of infants less than 6 months of age who visited health facilities in Bahir Dar city, Northwest Ethiopia, 2020.

## **4. METHODS AND MATERIALS**

### **4.1. Study Area**

The study was conducted in selected BahirDar city health facilities. Bahir Dar is the capital city of Amhara National Regional State. The city is located on the Southern shore of Lake Tana. It is located approximately 578 km Northwest of Addis Ababa, having latitude and longitude of 11°36'N 37°23'E with an elevation of 1840 meters above sea level. The city was established during the Italian occupation of the 1930s. Blue Nile, the longest river in the world flows across the town. Based on central statistics agency (CSA) the city has more than 314,000 inhabitants ,of these, 158,570 are females,75,360 are mothers in the reproductive age group and 47, 100 were under-five children (59) . In the city, there are three public hospitals, (two referral hospitals and one primary hospital), 4 private hospitals, 52 private clinics and 6 public health centers.

### **4.2. Study Design and Period**

Institution based cross-sectional study was conducted from March 11 to May 10, 2020.

### **4.3. Source Population**

All mothers having infants less than 6 months of age coming for immunization and under five OPD services in Bahir Dar city health facilities were the source population.

### **4.4. Study population**

Mothers having infants less than 6 months of age coming for immunization and under five OPD services during study period in selected Bahir Dar city health facilities were the study population.

### **4.5. Eligibility criteria**

#### **4.5.1. Inclusion criteria**

All mothers with infants less than 6 months coming for immunization and under five OPD service during study period.

#### **4.5.2. Exclusion criteria**

Care givers beside mothers who brought infants to facilities were excluded from the sample.



## **4.6. Study variables**

### **4.6.1 Dependent variable**

Formula feeding practice (Yes/No)

### **4.6.2 Independent variables**

#### **Maternal and infant socio-demographic factors: -**

- Maternal age, maternal educational status, maternal employment status, maternity leave, wealth index and residence, age of infant, sex of infant.

#### **Obstetric related factors: -**

- Place of delivery, Mode of delivery, Infant feeding counseling, Parity, ANC&PNC service

#### **Source of infant formula information: -**

- Media TV/Radio) advertisement of infant formula, Promotion of infant formula by health professionals, Peer / family pressure,

#### **Breast feeding related factors: -**

- Initiation time of breast feeding, colostrum feeding status.

#### **Behavior and knowledge related factors: -**

- Attitude towards formula feeding, knowledge of mothers on breast feeding, Perception of insufficient breast milk and Body image.

## **4.7. Operational and term definitions**

**Formula feeding practice: -** Mothers who ever fed infant formula before 6 months with or without breast milk for index infant.

**Breast milk substitutes: -** Any industrially formulated milk which is prepared for children less than six months up to one year and older children (10).

**Health professional promotion.** Defined as if mothers receive recommendations/advice from a health professional, to use infant formula for their infants once in a life time of the mother.

**Infant feeding counseling:-**Counseling of mothers by health professionals during community conference, ANC, delivery and PNC time about the benefit of exclusive breast feeding for the first 6 months, complementary feeding starting from 6months and continue breast feeding at least for 2 years.

**Perception of insufficient breast milk:**-Mothers perceive that their breast doesn't produce enough milk for their infant.

**Peer/family pressure:**-Influence of family /friends on mothers to use formula feeding by telling the benefit of the product.

**Perception of body image:**-Perception of mothers for their physical appearance, some of the mothers perceives that breast feeding change their body shapes specially their breast.

**Good knowledge of breast feeding:** - When the respondents correctly answer 70% or above for seven questions about breast feeding knowledge (60).

**Poor knowledge of breast feeding:** - when the respondents correctly answer below 70% of seven questions about breast feeding knowledge (60).

**Positive attitude about Formula feeding:** When the respondents answer 60% and above to favorable questions to formula feeding (60).

**Negative attitude about Formula feeding:** - When the respondents answer less than 60% to favorable questions to formula feeding (60).

**Wealth index** :- Was determined using the Principal Component Analysis (PCA) with SPSS by considering household assets, latrine, water source, live-stock, and agricultural land ownership adopted from EDHS 2016(61). Quintiles of the wealth score were created and respondents who were in the third quintile were rich (wealthy), in the second quintile were medium and in the first quintile were poor in their economic status.

## **4.8. Sample Size Determination**

### **4.8.1. Sample Size determination for the first specific objective**

The sample size was determined using a single population proportion formula as follows:

$n = z^2 p (1-p) / w^2$ ; where:

Z = Standard normal distribution value at 95 % CI, which is 1.96;

P = **47.2%** (P=0.472) prevalence of formula feeding practice from study done in Jimma, which was taken (43).

W = the margin of error, taken as 5%.

Accordingly, the sample size was,

$n = (1.96)^2 \cdot 0.472 (1-0.472) / 0.05^2 = 382$ , by considering 10 % non-response rate, and 1.5 design effect due to two stage sampling), the required sample size was **630**.

#### 4.8.2. Sample size determination for the second specific objective

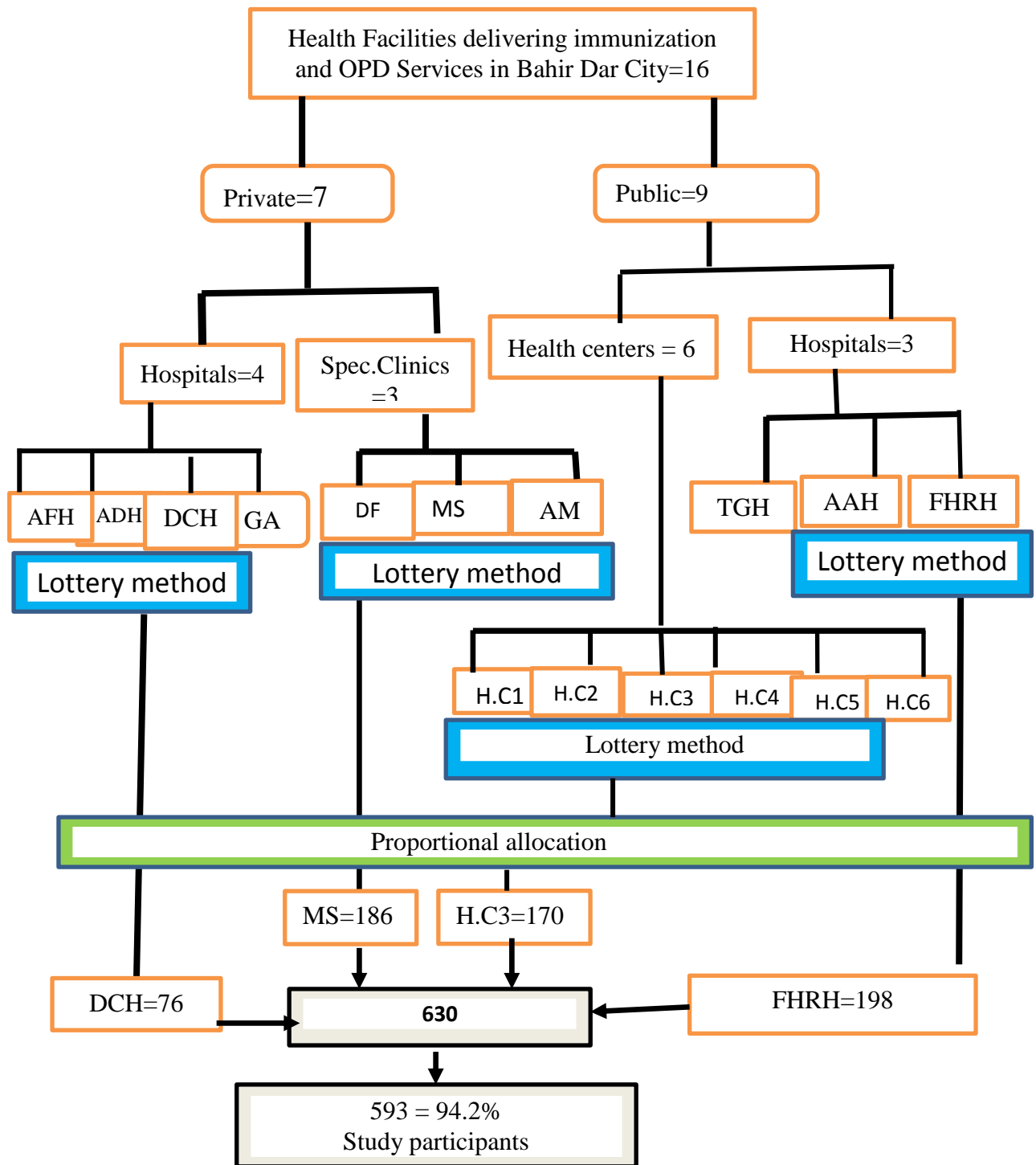
**Table 1:** Table shows sample size determination by factors using **Epi info** to assess formula feeding practice and associated factors in BahirDar city, Northwest Ethiopia, 2020.

N O	Variables	Confidence Level	Power	Ratio un-exposed/ Exposed	% of un-exposed	Odds ratio	% of exposed group	Sample size
1	Educational status(43)	95	80	1	19.9	3.39	48.2	100
2	Mode of Delivery(46)	95	80	1	12.1	3.38	50	56
3	Peer pressure(46)	95	80	1	17.6	3.47	50	78

- By comparing the two sample sizes the largest sample size was 630, so the total sample size was **630**. But **593** mothers were participated in this study.

#### 4.9. Sampling procedures

Health facilities giving immunization and under five OPD services which were three hospitals and six health centers from public institutions, four hospitals and 3 specialty clinics from private health facilities were stratified. Among above 52 private clinics three specialty clinics were selected purposely based on their client flow for immunization and under 5 OPD. From these health facilities, four of them (one from each) were selected by lottery method to insure representativeness. The calculated sample size was proportionally allocated for each health facilities according to pre-determined monthly client flow from previous year from service log book of each department. The sampling interval (Kth value) was calculated by dividing the total number of units in the population by desired sample size and k value was found to be 3. Then a number between one and K value was taken as random starting point and finally 2 was selected. When mothers with infants aged less than 6 months who fulfilled the inclusion criteria came to immunization and under 5 OPD service, they were selected by using systematic random sampling and interviewed until estimated sample size were achieved from each health facilities(**Figure 2**).



**KEY:** -TGH-Tibebe Ghion hospital, FHRH-Felege Hiwot hospital, AAH-Addis Alem Hospital, AFH-Afilas hospital, DCH-Dream Care hospital, GAH, Gambi hospital .DF-Dr Friew clinic, MS-Mari stops clinic, AM-Amarisa clinic, HC1-Han h.c,HC2-Shimbit h.c,HC3- BahirDar h.c,HC4-D/Minilik h.c,HC5-Abay h.c,HC6-Shumabo h.c.

**Figure 2:** - Schematic presentation of sampling procedure to select study participants (mothers who visited health facilities having under 6months infant in BahirDar City, Ethiopia,2020.

#### **4.10. Data collection tools and procedures**

Face to face interview was conducted among selected mothers having infants under 6 month of age using structured interviewer administered questionnaire adapted from EDHS and different literatures. The questionnaire was primarily prepared in English then translated to local language Amharic first and back to English to check consistency. Eight female diploma nurse data collectors and two BSc nurse supervisors were recruited from selected health facilities. Two days training was given for the data collectors by the primary investigator.

The collected data contains variables related to socio demographic characteristics, socio economic and housing condition (wealth index), obstetric related characteristics, infant feeding practice, source of infant formula information and mother's behavior and knowledge related factors. Data on formula feeding practice was collected by using "recall since birth" method.

#### **4.11. Data Quality assurance**

Data quality was assured through careful design of structured, pre tested questionnaire and data collection procedure. Before data collection training was given for data collectors on techniques of interview and data recording. The questionnaire was pretested to ensure their understandability by taking 5% (n=32) of sample volunteer mothers in Addisalem primary hospital. During data collection all the collected data were reviewed by the supervisors and principal investigator for its completeness and consistency. After collection, data was cleaned and coded to minimize errors before analysis.

#### **4.12. Data Processing and Analysis**

The collected data were coded and entered into Epi Data version 3.1 software and then exported to the Statistical Package for the Social Sciences (SPSS) version 23 for data analysis. Descriptive statistics like frequency distribution, percentage, mean and standard deviation was calculated. Associations between categorical variables were calculated using cross tabulations and chi-square statistics test. Socio-economic status (wealth index) was assessed by constructing an index by the use of Principal Component Analysis (PCA) of house hold assets. Cut off points were given for three equal groups of quintiles representing the poor to the rich (wealthy).

Bivariable and multivariable logistic regression analysis was used to investigate the independent predictors of formula feeding practice. Independent variables with P-value  $\leq 0.25$  during bivariable analysis was entered into the multivariable analysis model. Hosmer and Lemeshew's goodness-of-fit test (p-value=0.39) was applied to assess the fitness of the model.

Crude and adjusted odds ratio and 95% confidence interval was computed to assess the presence and degree of association between dependent and independent variables. P-value $<0.05$  in multivariable logistic regression was considered as statistically significant.

#### **4.13. Ethical consideration**

Ethical clearance was obtained from the institution review board of College of Medicine and Health Sciences, Bahir Dar University. Permission from health facilities and written informed consent from mothers was obtained. Confidentiality of the information will be kept except the investigator and data collectors.

#### **4.14. Dissemination of result**

The result of the study will be submitted to BahirDar University School of Public, Regional Health Bureau, Bahir Dar city administrative health department and participated health facilities. Effort will be made to disseminate the result through presentation and publication in a scientific journal.

## 5. RESULTS

### 5.1. Socio-demographic Characteristics

From 630 samples, 593 mothers with response rate of 94.12% had participated in the study. More than half of the study participants (56.5%) were in the age group of 25-34 years, While the mean age of study participants was 28 (5.25±SD) years, that ranges from 18-41years. Three-fourth of the study participants (75.9%) reported that they belong to Orthodox in religion and most 555(93.6%) of them were married. Though the study was conducted at health facilities in Bahir Dar city, some of the study participants 67(11.3%) reported that they reside in rural areas. Three-fourth of the participants were educated and attended above primary education levels. As to their occupation, 250 (42.2%) were house wives and 216(36.4%) of them were private and government employed mothers. Each one-third of the participants were poor, medium and high in their wealth index. More than two-third (68.3%) of the participants believe that short maternity leave led to formula feeding practice.

More than half (55.3%) of their infants were males. Three hundred sixty (60.7%) of their infants were in the age category of 1-3 months (Figure 3). Nearly two-thirds (63.5%) of the husbands of the mothers had secondary to college and above education levels. Furthermore, almost two-thirds (64.3%) of the husbands were government and private organization employees (Table 2).



**Table 2:** Socio-demographic characteristics of mothers and infants less than 6 months of age (n=593), in Bahir Dar city health facilities, Northwest Ethiopia, from March to May, 2020.

<b>Variables</b>	<b>Category</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Age</b>	15-24	163	27.5
	25-34	335	56.5
	35-49	95	16.0
<b>Religion</b>	Orthodox	450	75.9
	Muslim	112	18.9
	Protestant	31	5.2
<b>Residence</b>	Urban	526	88.7
	Rural	67	11.3
<b>Education of mother</b>	Illiterate	48	8.1
	Literate	545	91.9
<b>Marital status</b>	Married	555	93.6
	Single	30	5.1
	Divorced	6	1.0
	Widowed	2	0.3
<b>Occupation of mother</b>	House wife	250	42.2
	Government employee	145	24.5
	Merchant	76	12.8
	Private employer	71	12.0
	Farmer	38	6.4
	Daily laborer	9	1.5
<b>Education of father</b>	Illiterate	47	8.4
	Literate	508	91.6
<b>Occupation of father</b>	Government employee	222	40.3
	Private .employee	135	24.3
	Merchant	108	19.51
	Farmer	46	8.2
	Daily Laborer	44	7.9
<b>Infant sex</b>	Male	328	55.3
	Female	265	44.7
<b>Infant age</b>	1-3	360	60.7
	4-6	233	39.3
<b>Wealth index</b>	Poor	196	33.1
	Medium	197	32.2
	High	200	33.7

## **5.2. Obstetrics and breast feeding related Factors**

Half, 294 (49.6%) of the mothers had 2-4 children. All most all mothers 590 (99.5%) received ANC service at least once and 351 (59.5%) of respondents were attended ANC visits four times and above. Most, 493(83.6%) of the respondents received ANC service from governmental health facilities. Three forth of the mothers had received breast feeding counseling during ANC service. Five hundred eleven (86.0%) and 482(81.3%) of mothers were delivered by normal/vaginal delivery and attended PNC service after delivery respectively.

All mothers had ever practiced breast feeding for their infants of less than 6 months of age. While those mothers who put their infants at breast immediately with in the 1<sup>st</sup> hour of delivery were 527(88.9%). Most 567(95.6%) of them had fed first milk/colostrum to their infants. Five hundred forty two (91.4%) of mothers reported that they were practicing breast feeding of their infants during study period (Table 3).

**Table 3:** Obstetrics and breast feeding related factors of mothers who had infants less than 6 months (n=593) in BahirDar city, Northwest Ethiopia, March to May, 2020.

<b>Variables</b>	<b>Category</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Number of children</b>	1	280	47.2
	2-4	294	49.6
	≥5	19	3.2
<b>Number of pregnancy</b>	1-3	505	85.2
	4-7	88	14.8
<b>ANC</b>	Yes	590	99.5
	No	3	0.5
<b>Health facility ANC received (n=590)</b>	Government	493	83.6
	Private	97	16.4
<b>Number of ANC(n=590)</b>	Once	36	6.1
	Two times	74	12.5
	Three times	126	21.4
	Four times and above	354	60.0
<b>Breast feeding counseling (n=590)</b>	Yes	447	75.8
	No	143	24.2
<b>Place of delivery</b>	Gov't health facility	493	83.1
	Private health facility	96	16.2
	Home	4	0.7
<b>Mode of delivery</b>	Normal/vaginal	511	86.0
	C/S delivery	82	14.0
<b>Ever breast feeding</b>	Yes	593	100
	Within the 1 <sup>st</sup> hr.	527	59.6
<b>Time of the initiation of breast feeding</b>	After 1 hrs	40	4.5
	After 3 days	26	2.9
<b>Colostrum feeding</b>	Yes	567	95.6
	No	26	4.4
<b>Reason not feeding colostrum (n=26)</b>	Maternal illness	16	61.5
	Infant unable to feed	10	38.4
<b>Current breast feeding status of infant</b>	Yes	542	91.4
	No	51	9.6
<b>Postnatal care service(PNC)</b>	Yes	482	81.3
	No	111	18.7

C/S = Cesarean section; ANC = ante-natal care; Gov't = government

### 5.3. Behavior and Knowledge related Factors

Mothers were asked favorable questions for knowledge of breast feeding and attitude towards infant formula feeding practice. In general, among respondents 473(79.7%) had good knowledge about breast feeding and majority of mothers 511(86.2%) had negative attitude regarding to infant formula feeding practice. Most of the respondents 370(90.3%) didn't believe that infant formula protects maternal body image. (Table 4).

**Table 4:** Behavior and Knowledge related factors among mothers (n=593) who visited health facilities for their infants less than 6 months of age in BahirDar city, Northwest Ethiopia from March to May, 2020.

Variables	Category	Frequency	%
Knowledge of mothers to breast milk	Good	473	79.7
	Poor	120	20.3
Attitude towards formula feeding	Negative	511	86.2
	Positive	82	13.8
Do you think that formula feeding protects maternal body image?	Yes	40	9.7
	No	370	90.3
Perception of insufficient breast milk	Yes	72	49.6
	No	76	51.4

### 5.4. Exposure to infant formula information

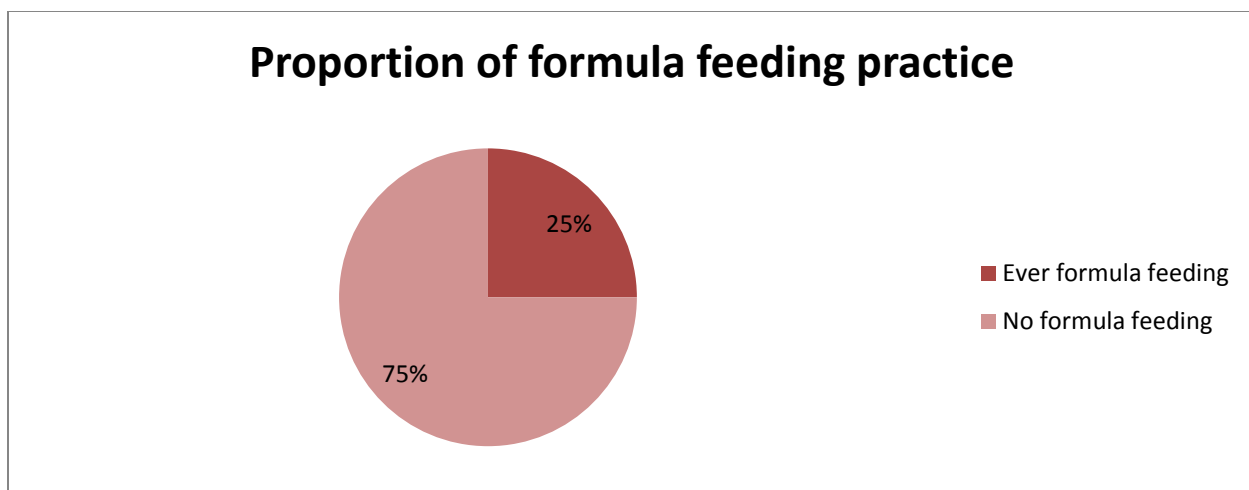
Four hundred ten (69.6%) of the mothers were exposed to infant formula information once in their life time. Two hundred thirty two of the mothers (56.5%) reported that they had been informed that infant formula is good for infant growth. A bit more than half of the study participants (51.5%) reported that they obtained information from TV/Radio followed by their families/friends 134(32.7%) (Table5).

**Table 5:** Exposure to the infant formula information of mothers (n=593) who visited health facilities for their infants less than 6 months of age in Bahir Dar city Northwest Ethiopia, March to May, 2020.

<b>variables</b>	<b>Category</b>	<b>Frequency</b>	<b>Per- cent</b>
<b>Exposed to infant formula in- formation</b>	Yes	410	69.6
	No	176	29.4
<b>Information received from advertisement (n=410)</b>	Good for infant growth	232	56.5
	Similar with breast feeding	118	28.7
	For infant intelligence	49	11.9
	Make infant beautiful	11	2.7
<b>Source of infant formula inform ation(n=410)</b>	TV/Radio	212	51.5
	Family/friends	134	32.7
	Health professionals	49	12.2
	Supermarket/pharmacy	15	3.6

### **5.5. Infant formula feeding practice**

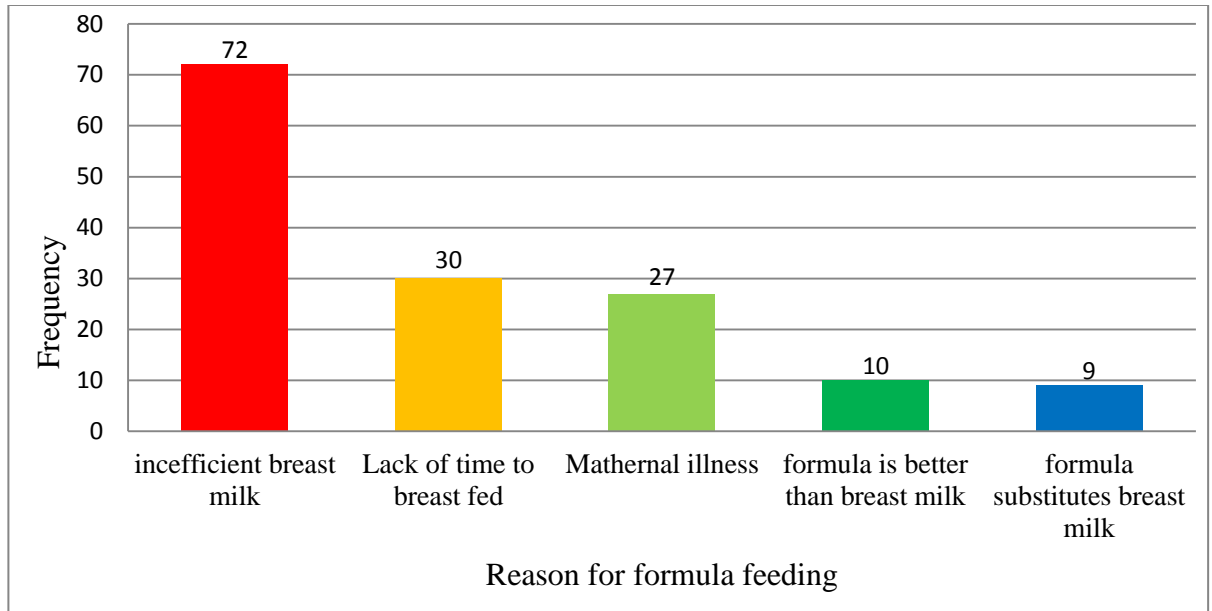
Out of the respondents 148(25%) mothers initiated formula milk once in their life time for their index infants. More than half 88(59.7%) of mothers started infant formula feeding within one month after delivery. The main reason behind infant formula feeding for their infant was insufficient breast milk 72(48.6%). During the study period, 51(34.5%) of them were continually giving infant formula milk for their baby. Of 410 respondents, 336 (81.9%) reported that they did not know risk factors of infant formula feeding. Mothers who fed infant formula for previous infant were 46 (14.6%) (Figure 3, Table 6).



**Figure 3:** Prevalence of formula feeding practice among mothers (n=593) of infants less than 6 months of age in Bahir Dar city, North West Ethiopia, March to May,2020.

**Table 6:** Infant formula feeding practice and its related factors among mothers with infant aged less than 6 months (n=593) in BahirDar city, Northwest Ethiopia from March to May, 2020.

Variables	Category	Frequency	Percent
<b>Introduction time of formula feeding (n=148)</b>	Within one month	88	59.7
	Between 1 and 3 months	32	21.6
	After 3 months	28	19.4
<b>Current status of formula feeding (n=148)</b>	Yes	51	34.5
	No	97	65.5
<b>Formula feeding experience to their previous infants (n=313)</b>	Yes	46	14.6
	No	267	85.3
<b>Do you think formula milk has health risks for infants</b>	Yes	74	18.1
	No	336	81.9



**Figure 4:** Reasons those mothers (n=148) claimed to give infant formula to their infants in Bahir Dar city, Northwest Ethiopia, March to May, 2020.

## 5.6. Factors Associated with Infant Formula Feeding Practice

Based on the bivariable analysis, age of the mothers, educational status of mother, occupation of mother, wealth index of the house hold, number of ANC, mode of delivery, time of initiation of the breast feeding, age of infant, source of information about infant formula and mothers attitude to formula feeding were associated with formula feeding practice ( $P \leq 0.25$ ).

Adjusting for potential confounders in the multivariable logistic regression model factors were assessed whether to have statistically significant association with mothers' practice of infant formula feeding. Hence, mothers in the age category of 25-34 years were 2.3 times more likely to feed infant formula compared to mothers in the age category of 15-24 years (AOR = 2.39; 95% CI = 1.295, 4.406).

As to occupation of mothers, those who were private employees [AOR = 6.73(95% CI = 2.756, 16.413)], government employees (AOR = 4.06; 95% CI = 1.895, 8.700) and merchants (AOR = 2.78; 95% CI = 1.066, 7.345) were 6.7, 4.1, 2.8 times more likely to practice infant formula feeding compared to those mothers who were house wives respectively. Mothers who reported positive attitude towards infant formula were 2.1 times more likely to practice infant formula feeding compared to their counterparts (AOR = 2.10; 95% CI = 1.090, 4.062). Mothers who initiate breast milk after one hour of delivery were 3.73 times more likely to practice infant formula feeding compared to those mothers who initiate breast milk within one hour of delivery (AOR = 3.73; 95% CI = 1.504, 9.252)].

Number of ANC visits was also associated with infant formula feeding practice and mothers who had ANC visits less than four times were 2.3 times more likely to feed infant formula for their infants less than 6 months of age compared to mothers who had 4 and above times of ANC visits (AOR = 2.29; 95% CI = 1.317, 3.997). Mothers who received information about infant formula feeding from supermarket/pharmacy (AOR=6.57;95%CI=1.481,29.155) and from families/friends (AOR = 2.24;95% CI=1.242,4.034) were 6.57 times and 2.24 times respectively more likely to practice infant formula feeding compared to those mothers who received information from TV/Radio (Table 7).



**Table 7:** Logistic regression model shows factors associated with infant formula feeding practice among mothers (n=593) who visited health facilities for immunization of their infants less than 6 months of age in Bahir Dar city, Northwest Ethiopia, from March to May, 2020.

Factors	Category	Formula feeding		COR(95% CI)	AOR(95%CI)
		Yes (%)	No (%)		
<b>Age (in years)</b>	15-24	33(22.3%)	130(29.2%)	1	1
	25-34	109(73.6%)	226(50.8%)	1.900(1.22, 2.10)*	<b>2.388(1.295, 4.406)**</b>
	35-49	6(4.1%)	89(20.0%)	0.266(0.107,0.660)*	0.134(0.026, 1.513)
<b>Education of mother</b>	Unable to R & W	9(6.1)	39(8.8)	1	1
	Able to R & W	9(6.1)	93(20.9)	0.419(0.155,1.136)*	0.395(0.078,2.014)
	Prim. education	31(20.8)	79(17.7)	1.700(0.737,3.921)*	1.728(0.450.6.630)
	Seco. education	64(43.2)	146(32.8)	1.900(0.869,4.152)*	0.741(0.222,2.472)
<b>Occupation of mother</b>	College+	35(23.6)	88(19.8)	1.723(0.756,3.928)*	0.554(0.157,1.961)
	House wife	50(33.8)%	200(46.3%)	1	<b>1</b>
	Government	49(31.1%)	96(22.2%)	2.042(1.29, 3.24)*	<b>4.060(1.895,8.700)**</b>
	Merchant	17(11.5%)	59(13.7%)	1.153(0.619, 2.15)	<b>2.798(1.066,7.345)**</b>
	Private	25(16.9%)	46(10.6%)	2.174(1.22, 3.87)*	<b>6.726(2.756,16.413)**</b>
<b>Wealth index</b>	Farmer	7(4.7%)	31(7.2%)	0.903(0.376,2.171)	1.718(0.492,2.026)
	Poor	58(39.2%)	139(32.4%)	1	1
	medium	40(27.0%)	160(37.5%)	0.599(0.377,0.951)*	0.692(0.355,1.349)
<b>Age of infant</b>	High	50(33.8%)	146(30.1%)	0.821(0.527,1.279)*	1.806(0.824,3.960)
	1 -3 months	69(46.6%)	291(65.4%)	0.462(0.317,0.674)*	0.703(0.395,1.254)
<b>Number of ANC visits</b>	4 -6 months	79(53.4%)	154(34.6%)	1	1
	1-3 times	85(57.4%)	151(34.2%)	2.549(1.744,3.728)*	<b>2.294(1.317,3.997)**</b>
<b>Mode of delivery</b>	4 times & above	63(42.6%)	291(65.8%)	1	<b>1</b>
	Normal/vaginal	116(69.6%)	395(91.5%)	1	1
<b>Initiation of BF</b>	C/S delivery	32(30.4%)	50(8.5%)	2.179(1.336,0.556)*	2.259(.977,5.222)
	Within 1 <sup>st</sup> hr.	119(73.6%)	408(93.9%)	1	1
<b>Attitude towards IF</b>	After 1 hour	29(26.4%)	37(6.1%)	2.687(1.586,4.553)*	<b>3.73(1.504,9.252)**</b>
	Positive	39(26.4%)	43(9.7%)	3.345(2.065,5.418)*	<b>2.10(1.090,4.062)**</b>
<b>Source of information about IF</b>	Negative	109(73.6%)	402(90.3%)	1	1
	TV/Radio	67(45.3%)	145(55.3%)	1	<b>1</b>
	Health profess.	15(10.1%)	34(13.0%)	0.948(0.485,1.855)*	1.67(0.676,4.135)
	Supermarket/pharmacy	9(6.1%)	6(2.3%)	3.318(1.135,9.704)*	<b>6.57(1.481,29.155)**</b>
	Family / friends	57(38.5%)	77(29.4%)	1.588(1.013,2.490)*	<b>2.24(1.242,4.034)**</b>

IF = infant formula; BF = breast feeding; R & W = read and write; C/S = Caesarian Section; College+ = college and above ; 1=Reference \*= Significant at p-value of  $\leq 0.25$  & \*\* Significant at p-value of  $\leq 0.05$

## 6. DISCUSSION

This study was intended to assess the prevalence and factors associated with formula feeding practice among mothers who visited health facilities for immunization and under 5 OPD services for their infants aged below 6 months in BahirDar city.

There is now widespread promotion of infant formula and mothers are fascinated by the prospect of a high technology product which promises much for their infants. On the other hand, cultural beliefs are still strong and most mothers commence breastfeeding, but they tend to combine this with infant formula in the early months of their infants. Formula-feeding is becoming a common practice in various parts of Ethiopia due to various socio-cultural reasons.

The result of this study revealed that the prevalence of infant formula feeding practice was 25% (95%CI; 21.7-28). This finding is comparable with study done in Nigeria (28%) (39). The finding in this study was higher than studies done in Gondar town, Northwest Ethiopia (12.4%) Offa district, Southern Ethiopia (7.8%) and DireDawa 21.4% (41,46,48). The finding was lower than studies done in different parts of Ethiopia ;Hawassa (29.6%), Jimma zone (47.2%), Bishoftu (65%) and Mekelle (68.8%) (42,44,45,47). This finding also lower as compared to studies in Egypt USA (31.3%), Ireland (81.8%), Cambodia (43.1%) (35-37,40). There is no regional as well as national formula feeding practice data in EDHS to compare with this study.

These differences in prevalence of infant formula feeding practice between the current and previous studies might be attributed to the methodological variations among studies. Most of the previous studies were community based. Farther more infant related factors like age of infant which some of the studies include infants up to 24 months, utilization of health services like ANC&PNC, accessibility and availability of infant formula and the differences in socio-economic conditions of study participants may also contribute to the differences in reported prevalence among studies.

Out of those mothers who practiced infant formula feeding, 48.6% (72/148) indicated that the main reason behind infant formula feeding for their infants was insufficient breast milk, which is consistent with studies conducted in Ethiopia: Jimma and DireDawa (43, 46) and studies in Egypt, India and Island (9, 38, 40). This highlights the importance of educating mothers about

milk production, milk supply, as well as infants' needs in the first weeks of life. Mothers should be informed that inadequate milk production is primarily caused by formula supplementation; leading to improper breast stimulation and emptying. In particular, mothers should be educated that the small volumes of colostrum produced in the first days of breastfeeding adequately meet infants' needs.

The current study revealed that occupation of mother, number of ANC visit, breast feeding initiation time, attitude of mother towards formula feeding, source of infant formula information and age of mothers were significant factors associated with formula feeding practice among mothers who visited health facilities for infants less than 6 months of age.

Occupation of mothers was significant factor associated with infant formula feeding practice. Mothers who were private employed, government employed and merchants were 6.7 times, 4 times and 2.28 times higher chance to practice formula feeding than house wives respectively. This is consistent with other study findings in Agaro, Ethiopia (44) Capcost and Vietnam (49, 50). The possible reason might be mothers who worked outside their home lack the time to breastfeed their child. This was due to employed mothers go back to their work after completed their 4 months maternity leave and others were ready for work that led them to feed formula for their infant. The other possible explanation could be mothers working outside might have more income to buy infant formula than those who were house wives, who might be dependent on their spouse.

Significant association was observed between number of ANC visit and formula feeding practice, mothers who had  $\leq 3$  ANC visits were 2.29 times more likely to formula feeding practice as compared to those mothers who had ANC visit of 4 times and above. This is in line with other study findings from Jigjiga town and Egypt (40,62). The possible reason might be mothers who visited health facilities frequently were more counseled about advantages of breast feeding, which in turn led mothers more to breast feed their infants exclusively than infant formula.

Breast feeding initiation time had significant association with formula feeding practice. Those mothers who were initiated breast feeding for their child after one hour of delivery were 3.7 times more likely to practice infant formula feeding than those who were initiated breast feeding within one hour after delivery. Which was comparable with studies done in Bishoftu, Ethi-

opia and Nigeria (39,45). This is due to that those mothers who delayed to start breast feeding due to different reasons, could use formula milk feeding for their infant which is easily available in pharmacy and supermarkets and ready to use than other feeding options .

This study revealed that attitude of mothers to infant formula had significant association with infant formula feeding practice. Those mothers who had positive attitude for infant formula were 2 times more likely to give formula milk for their infant than those who had negative attitude. This finding is similar with study findings from Jimma zone and Ireland (36,43). The possible explanation could be that those mothers who think that formula feeding is better or that formula has a similar quality to breast milk and those who had less awareness about possible risks of infant formula, could have more formula feeding practice. This is evidenced by 81.1% of study participants who practicing infant formula feeding didn't know any risks of infant formula feeding.

Significant association was observed between source of infant formula information (counseling) and infant formula feeding practice. Those mothers who got information from supermarket/pharmacy and from their family/ friends were 6.5 and 2.2 times more likely to practice infant formula feeding respectively. This study is consistent with study done in DireDawa and Hong Kong(53). Study in Hong Kong, showed women to be more likely to initiate discussions about infant feeding with family and friends, because health care providers are perceived as not being supportive of formula-feeding. Advice from friends, neighbors and family heavily influenced to initiation of infant formula feeding. This could be due to that mostly mothers were practicing what their friends and families were doing and influenced by informal advices. Another reason could be information from health professionals include both risk of infant formula milk and importance of exclusive breast feeding. But information from peer's family and sellers mainly didn't focus on risks of infant formula milk which facilitates initiation of infant formula feeding.

In this study age of mothers was one of the predictor of infant formula feeding practice. The odds of ever formula feeding practice among mothers of aged 25-34 were 2.39 times higher as compared to mothers of age group between 18-24 years. This study was comparable with study done in Debre Birhan (63). This might be due to that young mothers had less experience to

share other feeding options other than breast feeding and those mothers who didn't have experience to formula feeding for their previous child could want to try the benefits of formula milk to their next infant .This finding is evidenced by 77% of mothers who didn't have formula feeding experience for previous child had infant formula feeding practice for index infant.

## **7. LIMITATION OF THE STUDY**

- Recall bias and response bias since infant formula feeding was assessed based on self-reporting questions.
- Since data collectors were from selected health facilities which may led to bias.

## **8. CONCLUSION AND RECOMMENDATIONS**

### **8.1 Conclusion**

While WHO recommends Exclusive breast feeding for infants aged less than 6 months, inappropriate infant formula feeding was prevalent in the study area. This prevalence is not acceptable to ensure good health and better nutritional status of children. Mothers whose age group of 25-34 years, occupation of employed and merchant mothers, mothers having  $\leq 3$  ANC visits, delay in breast feeding initiation after birth, those whose source of information about infant formula was from supermarket/pharmacy and from their family/ friends and having positive attitude to infant formula were statistically significant factors that increase infant formula feeding practice

### **8.2. Recommendations**

Based on the findings of this study the following recommendations are forwarded.

- Policymakers should strictly follow marketing of formula milk and implementation of code of conduct on breast milk substitutes.
- Health care professionals should upgrade and strength ANC service provision to the mothers with strong breast feeding counseling. They should also give right information including risks of formula milk which mothers promoted by formula sellers and peer pressure to change their attitude towards formula feeding.
- Further longitudinal research should be done to determine the exact level of formula feeding practice.

## 9. REFERENCE

1. Kramer, M.S. and Kakuma, R. The Optimal Duration of Exclusive Breastfeeding: A Systematic Review. World Health Organization, Geneva. 2001.
2. WHO/UNICEF. Infant and Young Child Feeding Counseling: An Integrated Course. Participant's Manual, 2006.
3. WHO/UNICEF, Global Strategy for Infant and Young Child Feeding. World Health Organization, Geneva, 2003.
4. WHA. Global Nutrition Targets 2025: Breastfeeding Policy Brief .World Health Assembly, 2012.
5. Sinhababu A . Infant- and young child-feeding practices in Bankura district, West Bengal,India. *J Health Popul Nutr.* 2010;28((3)):294–9.
6. Shamim S JS, Naz F. . Determinants of bottle use amongst economically disadvantaged mothers. *J Ayub Med Coll Abbottabad.* 2015;18((1)):1–4.
7. WHO. Protecting promoting and supporting breast feeding in facilities providing maternity and new born care. World Health Organization, 2017.
8. ICF/EPHI. Ethiopia Mini Demographic and Health Survey ;Key Indicators. Rockville, Maryland, USA: EPHI and ICF.). 2019.
9. Ethiopian FMHACA. Infant Formula and Follow-up Formula Directive. Adiss Ababa Ethiopia, March, 2016.
10. Mayo C. Breast-feeding vs. formula-feeding: What's best? . April 10, 2018.
11. Marsha.W. Formula Supplementation of Breastfed Infants, good or hasardous?, infant, Child, & Adolescent Nutrition 2015;7(4):198.
12. Oddy W. Infant feeding and obesity risk in the child .*J Breastfeeding Review*, July 2012;20(2):729-759.
13. Walker M. A fresh look at the risks of artificial infant feeding. *Journal of Human Lactation.* 1993;9(2):97-107.
14. WHO, UNICEF. Marketing of breast-milk substitutes: national implementation of the international code, status report 2018: *World Health Organization*; 2018.
15. WHO. Learning from large-scale community-based programmes to improve breastfeeding practices. World Health Organization, 2008.
16. Woldie T, Kassa A, Edris M. Assessment of exclusive breast feeding practice and associated factors in Mecha District, North West Ethiopia. *Sci J Public Health.* 2014;2(4):330-6.
17. Oot L, Sommerfelt A, Sethuraman K, Ross J. Estimating the Effect of Suboptimal Breast feeding Practices on Child Mortality: A Model in profiles for Country-Level Advocacy. Washington, DC: FHI. 2015;360.
18. WHO, UNICEF. Marketing of breast-milk substitutes: national implementation of the international code. Status report 2016. Geneva: World Health Organization; 2016.



19. WHO. A tool for assessing national practices, policies and programmes Geneva: World Health Organization. 2003:27-43.
20. UNICEF,Children. ST. Nutrition in the First 1,000 Days ,·A state of the World’s mothers, 2012.
21. Appleton J, Laws R, Russell CG, Fowler C, Campbell KJ, Denney-Wilson E. Infant formula feeding practices and the role of advice and support: an exploratory qualitative study.*BMC pediatrics*. 2018;18(1):12.
22. Gibbs B, Forste R. Socioeconomic status, infant feeding practices and early childhood obesity. *Pediatric obesity*. 2014;9(2):135-46.
23. Oddy W. Infant feeding and obesity risk in the child. *Breastfeeding review*. 2012;20(2):7.
24. Stuebe A. The risks of not breastfeeding for mothers and infants. *Reviews in obstetrics and gynecology*. 2009;2(4):222.
25. Ljung K, Palm B, Grandér M, Vahter M. High concentrations of essential and toxic elements in infant formula and infant foods–A matter of concern. *Food chemistry*. 2011;127(3):943-51.
26. Nguyen P, Binns CW, Van Ha AV, Chu TK, Nguyen LC, Van Duong D, et al. Pre-lacteal and early formula feeding increase risk of infant hospitalisation: a prospective cohort study. *Archives of disease in childhood* 2019,31-37.
27. Di Mario S, Gagliotti C, Donatini A, Battaglia S, Buttazzi R, Balduzzi S, et al. Formula feeding increases the risk of antibiotic prescriptions in children up to 2 years: results from a cohort study. *European journal of pediatrics*. 2019;178(12):1867-74.
28. Hengstermann S, Mantaring JBV, Sobel HL, Borja VE, Basilio J, Iellamo AD, et al. Formula feeding is associated with increased hospital admissions due to infections among infants younger than 6 months in Manila, Philippines. *Journal of Human Lactation*. 2010;26(1):19-25.
29. WHO. Guideline: protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services. World Health Organization, 2017.
30. UNICEF. The State of the World’s Children .Children, Food and Nutrition: Growing well in a changing world. UNICEF, New York. 2019.
31. UNICEF E. Breastfeeding gives children the best start in life: key for sustainable development , 2016 Mayo clinic, Breast-feeding vs. formula-feeding: What's best? , 2018.
32. MOH . Government of Ethiopia National nutrition program from 2016-2020,2016.
33. MOH Ethiopia. National strategy for infant and young child feeding ,2004.
34. UNICEF. Breastfeeding gives children the best start in life: key for sustainable development, 2016.
35. Madan JC, Hoen AG, Lundgren SN, Farzan SF, Cottingham KL, Morrison HG, et al. Association of cesarean delivery and formula supplementation with the intestinal microbiome of 6-week old infants. *JAMA pediatrics*. 2016;170(3):212-9.
36. Tarrant RC, Kearney JM. Public health nutrition Breast-feeding practices in Ireland: Symposium on The challenge of translating nutrition research into public health nutrition’. *Proceedings of the Nutrition Society*. 2008;67(4):371-80.

37. Pries AM, Huffman SL, Mengkheang K, Kroeun H, Champeny M, Roberts M, et al. Pervasive promotion of breastmilk substitutes in Phnom Penh, Cambodia, and high usage by mothers for infant and young child feeding. *Maternal & child nutrition*. 2016;12:38-51.
38. Pierro J, Abulaimoun B, Roth P, Blau J. Factors associated with supplemental formula feeding of breastfeeding infants during postpartum hospital stay. *Breastfeeding Medicine*. 2016;11(4):196-202.
39. Onyechi U, Nwabuzor L. The effect of milk formula advertisement on breast feeding and other infant feeding practice in Lagos, Nigeria. *Agro-Science*. 2010;9(3).
40. Tawfik S, Saied D, Mostafa O, Salem M, Habib E. Formula Feeding and Associated Factors among a Group of Egyptian Mothers. *Open access Macedonian journal of medical sciences*. 2019;7(11):1854.
41. Lenja A, Demissie T, Yohannes B, Yohannis M. Determinants of exclusive breastfeeding practice to infants aged less than six months in Offa district, Southern Ethiopia: a cross-sectional study. *International breastfeeding journal*. 2016;11(1):32.
42. Adugna B, Tadele H, Reta F, Berhan Y. Determinants of exclusive breast feeding in infants less than six months of age in Hawassa, an urban setting, Ethiopia. *International breastfeeding journal*. 2017;1:45.
43. Abebe L, Aman M. Formula-feeding practice and associated factors among urban and rural mothers with infants 0–6 months of age: a comparative study in Jimma zone Western Ethiopia. *BMC pediatrics*. 2019;19(1):408.
44. Seid SS, Muluneh E, Sinbirro IA, Moga TT, Haso TK, Ibro SA. Utilization of Bottle Feeding Practices and Associated Factors among Mothers Who Have Infant Less than 12 Months of Age in Agaro Twon, Jimma Zone South West Ethiopia, 2018. *Health Science Journal*. 2019;13(1):1-10.
45. Deme GG, Bekele SA, Argaw MD, Berhane Y. Factors associated with early initiation of complementary feeding in Bishoftu Town, Oromia, Ethiopia. *Open Access Libr J*. 2015;2(e1949):1-9.
46. Debebe A, Nuri A. Magnitude and Factors Associated with Infant Formula Feeding Among mothers Attending Public Health Institutions in Dire Dawa, *Eastern Ethiopia*. *Asian J. Med.* 2018;7(4).
47. Tadesse Y. Effect of 1000 days message disseminated through TV and radio on Maternal and Child Feeding practice, Mekelle City, Tigray region, Ethiopia: Addis Ababa University; 2018.
48. Admasu MAaEC. Breastfeeding Knowledge, Attitude, and Practice and Related Determinants Among Maternal in Gondar, Ethiopia: Cross-Sectional Study. 2016;5(1):p. 25-30.
49. Sika-Bright S. Infant feeding practices in Cape Coast: A sociological approach. 2011:10p.
50. Henry ME. Formula use in a breastfeeding culture: changing perceptions and patterns of young infant feeding in Vietnam: Johns Hopkins University; 2015.
51. ACF final of fInternational. Irresponsible Marketing of Formula Milk. March 2018.
52. Piwoz EG, Huffman SL. The impact of marketing of breast-milk substitutes on WHO recommended breastfeeding practices. *Food and nutrition bulletin*. 2015;36(4):373-86.

53. Sze KY, Chan ZCY, Chiang VCL. Women's experiences of formula feeding their infants:an interpretative phenomenological study. *Frontiers of Nursing*. 2018;5(1):49-59.
54. Chantry CJ,Dewey KG,Peerson JM, Wagner EA, Nommsen-Rivers LA. In-hospital formula use increases early breastfeeding cessation among first-time mothers intending to exclusively breastfeed. *The Journal of pediatrics*. 2014;164(6):1339-45.
55. Tarrant R. Mothers who formula feed: their practices, support needs and factors influencing their infant feeding decision. . *Child Care in Practice* 2013;19(1):78-94.
56. Prak S, Dahl M, Oeurn S, Conkle J, Wise A, Laillou A. Breastfeeding trends in Cambodia, and the increased use of breast-milk substitute why is it a danger? *Nutrients*. 2014;6(7):2920-30.
57. Zanardo V, Pigozzo A, Wainer G, Marchesoni D, Gasparoni A, Di Fabio S, et al. Early lactation failure and formula adoption after elective caesarean delivery:cohort study.*Archives of Disease in Childhood-Fetal and Neonatal Edition*. 2013;98(1):F37-F41.
58. Tadesse T, Mesfin F, Chane T. Prevalence and associated factors of non-exclusive breastfeeding of infants during the first six months in rural area of Sorro District, Southern Ethiopia: a cross-sectional study. *International breastfeeding journal*. 2016;11(1):25.
59. Central Statistical Agency. Population projection of Ethiopia for all regions at wereda level from 2014 - 2017,Addis Ababa. 2013.
60. Mikias A. Assessment of knowledge, attitudes and practices regarding maternal nutrition among pregnant women attending antenatal care clinics in public hospitals in Addis Ababa,Ethiopia, 2015
61. ICF ,Central Statistics Agency. Ethiopia Demographic and Health Survey Addis Ababa, Ethiopia,. 2016.
62. Muse.O. Assesing the association between infant formula promotion and exclusive breast feeding practice among mothers of infants aged 0-5 months, Jigjiga town. 2017.
63. Asfaw M, Kefene Z. Factors associated with exclusive breastfeeding practices in Debre Berhan District, Central Ethiopia: a cross sectional community based study. *International Breastfeeding Journal*. 2015;10:23.

## 10. APPENDEX

### **Annex I: English version of participant Information sheet**

**Title of the Research Project:** Formula feeding practice and associated factors among mothers of less than six months in BahirDar City, Northwest Ethiopia.

**Name of Investigator:** Hamelmal Azene (BSc)

**Name of the Organization:** Bahir Dar University, College of Medicine and health sciences, School of public health, Department of Human nutrition and dietetics.

#### **Introduction**

You are invited to participate as study subject in a research conducted by Mph student, from BahirDar University. Your participation is voluntarily. The research teams include one principal investigator, data collectors and two advisors. Please take as much time as you need to read or hear about the information sheet.

#### **Purpose of the Research Project**

The aim of this study is to assess the prevalence of formula feeding practice and associated factors among mothers of infants less than 6 months. It is important to determine the prevalence of formula feeding practice that will be helpful to provide baseline information for designing and implementing specific effective interventions to promote exclusive breast feeding.

**Procedure:** In order to perform the study, you are invited to take part in this project. If you are willing to participate, you need to understand the purpose of the study and give your consent. The required data will be collected by a nurse. Then, you are requested to give your consent to the data collector.

#### **Risks and Discomforts**

There are no anticipated risks to your participation.

#### **Benefits of the study**

The result of the study will be beneficial to design effective prevention and promotion measures for exclusive breast feeding. Hence, you are indirectly benefiting the society in this respect.

**Compensation for participation:** You will not receive any payment for your participation in this research study.

**Confidentiality:** There is no sensitive issue that you will be asked related with your social desirability but any information that is obtained in connection with this study and that can be identified with you will remain confidential. The information collected about you will be coded using numbers.

**Participation and withdrawal:** You can choose whether to be a part of this study or not. You may withdrawal at any time without consequences of any kind. You may also refuse to give any information.

**Person to contact:** If you have any question you can contact any of the following (Investigator and Advisors) and you may ask at any time you want.

Hamelmal Azene (Investigator), phone: +251-910960965,

E-mail: [hameledt@gmail.com](mailto:hameledt@gmail.com)

1. Dr. Netsanet Fentahun(advisor), phone: +251-,913516677

E-mail: [netsanet-fentahun@yahoo.com](mailto:netsanet-fentahun@yahoo.com)

2. Mr. Hunegnaw Almaw (advisor), phone: +251-918802259

E-mail: [hunsew25@gmail.com](mailto:hunsew25@gmail.com)

## Annex II: Participant Consent form

Hello! My name is ..... I am here on behalf of, Hamelmal Azene Alemu a student in Bahir Dar University, college of medicine & health sciences School of Public Health, Department of nutrition and Dietetics. She is conducting a research for the partial fulfillment of the requirements for the degree of master's in Public Health Nutrition on Infant formula feeding practice and associated factors among mothers of infant aged less than 6 months of age in BahirDar city, Northwest Ethiopia.

I am going to ask you some questions that are related with infant formula feeding practice and associated factors. Your name will not written in this form and the information you give is kept confidential and used only for this study. Only principal investigator and supporter have the information. If you do not want to answer all or some of the questions, you do have the right to do so. However, your willingness to answer all of the questions would be appreciated.

Would you participate in responding to the questions in this questionnaire? -----

Yes -----No

Name and Signature of participant of the study \_\_\_\_\_ Date

\_\_\_\_\_

Name and signature of data collector \_\_\_\_\_

Date\_\_\_\_\_

### Annex III: English version Questioners

**BAHIR DAR UNIVERSITY**  
**COLLEGE OF MEDICIENE AND HEALTH SCIENCE**  
**SCHOOL OF PUBLIC HEALTH**

Questionnaire designed to assess the prevalence and associated factors of formula feeding practice in Bahir Dar city ,2020.

**Instruction:** This questionnaire is designed for the purpose of face to face interview to collect data from mothers of infants less than 6 months.

**Note:** This questionnaire has to be filled only by the interviewer once informed consent is obtained from respondents. Put the answer in blank spaces for open ended questions and circle for multiple choice responses.

#### **Part 1: Socio Demographic Data of Mother and child**

S. no	Question	answer	Skip
101	How old are you?	----- in completed years	
102	What is your current marital status?	1.Married 2.Single 3.Divorced 4.Widowed	
103	What is your level of education?	1.Unable to read and write 2. Able to read and write 3. Primary education 4. Secondary education 5. College and above	
104	What is your religion?	1. Orthodox 2. Protestant 3. Muslim 4. Other (specify)-----	

105	What is your resident?	1.Urban 2.Rural	
106	What is your current occupation?	1.Private employee 2.Goverment employee 3.Daily laborer 4.Trader/Private company 5.Farmer 6. Housewife 7. Other (Specify) -----	
107	What is your husbands' level of education?	1.Unable to read and write 2. Able to read and write 3. Primary education 4. Secondary education 5. College and above	
108	What is your husbands' current occupation?	1.Private employee 2.Goverment employee 3.Daily laborer 4.Trader/Private company 5.Farmer 6. Other (Specify)-----	
109	How old is your current child?	-----in Months	
110	Gender of your current child?	1.Male 2. Female	
111	Birth order of the current child	-----	
112	Birth spacing with the previous child?	-----years	
113	Estimated weight of the child?	1.Low birth weight 2.Normal 3.Big baby	
113	Number of babies delivered in last pregnancy	1.single 2.twins	



		3.other-----	
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**Part II: Questions for assessing house hold socio economic status (wealth index)**

<b>A. Housed hold assets and housing condition.</b>			
201	Who is the owner of the house?	1.private 2.rental 3.other.....	
202	What are the main construction materials used in exterior walls?	1.cement 2.wood with mud 3.other(specify)_____	
203	What is the main construction material used for the roof ?	1.cement/concrete 2. Corrugated iron/metal 3.other(specify)	
204	What is the main construction material used for the floor of your house?	1.Mud 2.sand 2.Cement 5.Ceramic	
205	Did you have a separating room for sleep?	1. Yes 2.No .If Yes, how many?	
206	Did you have a separating room for kitchen?	1.Yes 2.No	
207	Did you have a separate room for animals?	1.Yes 2.No	
208	Did you have a separate room for toilet?	1.Yes 2.No	
209	Please tell me if your household has any of the following	1.Electricity 1.Yes 2.No 2.Clock/watch 1.Yes 2.No 3.Radio 1.Yes 2.No 4.Television 1.Yes 2.No	

		5.Mobile phone 1.Yes 2.No 6. Home phone 1.Yes 2.No 7.refrigerator 1.Yes 2.No 8.chair 1.Yes 2.No 9.Sofa 1.Yes 2.No 10.Table 1.Yes 2.No 11. Bed with cotton, sponge mattress 1.Yes 2.No 12. Electric Mitad/stove 1.Yes 2.No 13.Solar 1.Yes 2.No	
210	Does the house hold own the following? (multiple answer is possible)	1.Bicycle 1.Yes 2.No 2.Motor cycle 1.Yes 2.No 3.Animal drawn cart 1.Yes 2.No 4.Car/truck 1.Yes 2.No,How many----	
211	Does the household own any livestock, herds, other farm animals or poultry?	1.yes 2.no	
212	If <b>Yes</b> for 211, how many of the following animals do you have?	1.Milk cows----- 2.oxen or bulls _____ 3.Chicken _____ 4. Goats _____ 5. Sheep _____ 6.Donkey or mule _____ 7. Beehives _____ 8.Others-----	
213	Does your household own any agricultural land?	1.Yes, -----hectar/kada 2.No	
214	If No, what is the source of your production?	-----	

215	How many quintals of the following do you produce annually?	1.Maize in quintal----- 2.Teff in quintal----- 3."Peper"----- 4.Others-----	
216	What's the main source of drinking water?	-----	
217	Do you have a functional latrine/toilet facility?	1.Yes 2.No	
218	If yes for Q 239 What kind of toilet your households use?	1.Traditional pit latrine 2.Pit latrine with slab 3.Ventilated improved pit latrine 4.No facility/bush/woods	
219	What type of fuel does your household mainly use for cooking? (multiple answer is possible)	1.Electricity 2.Natural gas 3.Wood 4.Charcoal 5.Animal dung 6. Other (specify).....	

**Section III. Obstetrics and related health service questions.**

301	How many children do you have currently?	_____ children
302	How many times of pregnancy did you have?	-----
303	Did you receive ANC service during your current child pregnancy?	1.Yes 2.No
304	How many times did you receive ANC during last pregnancy?	1.Once 2 Two times

		3.Threetimes 4.Four times and above
305	If yes where did you receive ANC service?	1.Gov.t Health Facilities 2.Private Health facilities 3.other-----
306	Did you receive counseling about breast feeding during your ANC visit?	1.Yes. 2.No
307	Where did you give birth of this infant?	1.Gov.t Health Facilities 2.Private Health Facilities 3.Home 4..Other,speify----- _____
308	What was the mode of your delivery?	1.Normal/vaginal 2.C/S
309	Did you receive PNC service after delivery?	1.Yes 2.No

#### Section IV: -Infant health and breast-feeding related practice

	<b>A. Breast Feeding practice</b>		<b>Skip</b>
401	Have you ever breast fed your current baby?	1.Yes 2.No	Skip Q -402&403 if no for Q-401
402	How soon after birth did you put your infant for the first time to breast feed?	1.Immediately with in 1hr. of birth 2.After 1 hour 3.After 3 days 4.other-----	
403	If yes, to ever breast fed has your in	1.Yes	

	fant fed breast milk currently?	2.No		
404	Have you fed the first breast milk?	1.Yes 2.No		
405	If you did not feed first milk/ colostrum what was the reason?	1.Infant unable to feed 2.Is not good for infant health 3.It's a tradition/culture 4.If other-----		
<b>B. Infant formula feeding related questions.</b>				
406	Have you ever heard/seen any information talking about infant formula?	1.Yes 2.No		
407	If you heard/seen, what kind of information did you received? <b>(Multiple answers are possible)</b>	1.Infant formula is good for infant Growth 2.Infant formula make the infant smart 3.Infant formula is good for infant intelligence 4.Infant formula has same nutritional benefits as breast feeding 5.If other-----		
408	If yes. from where did you received?	1.From radio/TV 2.From health professionals 3.From supermarket keepers 4.From friends/family 5.Other, specify_-----		
409	Have you ever fed infant formula to your current infant?	1.Yes 2.No		
410	If Yes, at what age of the child did you begin formula feeding?	-----		
411	What was your reason to start formula milk to your infant?	1.Due to insufficient breast milk 2.Mathernl illness 3.Child illness		

		4.Have no enough time to breast feed 5.Formula milk is good as breast milk 6.Formula milk is better than breast milk 7.Others-----		
412	If Yes for Question no 409, Have you fed infant formula milk currently?	1.Yes 2.No		
414	If your infant fed infant formula, from where you get/buy the infant formula milk?	1.From pharmacy/drug shops 2.From supermarkets 3.From family 4.From health professionals 5.Other, specify. _____		
415	Did your previous infants ever feed an infant formula milk?	1.Yes 2.No		
416	Would you recommend formula feeding to anyone?	1.Yes 2.No		
417	Do you know the side effects of formula feeding to your baby?	1.Yes 2.No		
418	If Yes, what are these side effects that you know?	-----		
419	Do you think short maternity leave leads to formula feeding practice?	1.Yes 2.No		
420	Did your family /friends push you to use infant formula for your infant?	1.Yes 2.No		

**Section V: Knowledge and Attitude of mothers towards breast and  
Formula feeding questions.**

<b>A. Knowledge Questions</b>			
Questions	Responses		
1. Is feeding breast milk only adequate to babies in the 1 <sup>st</sup> 6months of life?	1.Yes 2.No 3.I don't know		
2. Does breast milk protective the child from childhood illnesses?	1.Yes 2.No 3.I don't know		
3.Does Feeding only formula or other food to babies is expensive than breast milk?	1.Yes 2.No 3. I do not know		
4. Does Breast milk is nutritious?	1.Yes 2.No 3. I do not know		
5.Does Breast feeding increases bonding between mother and infant?	1.Yes 2.No 3. I do not know		
6 .Does breast feeding has contraceptive benefit?	1.Yes 2.No 3. I do not know		
7. Does breast feeding have better advantage than formula feeding?	1.Yes 2.No 3. I do not know		
<b>B. Attitude questions</b>			
Items	Responses		
1. Formula-feeding ensures optimal health for the baby.	1.Agree	2.Neutral	3. Disagree.

<b>2.</b> Formula feeding cause excessive weight gain for baby.	1.Agree	2.Neutral	3.Disagree
<b>3.</b> Formula-feeding is more convenient than breastfeeding.	1.Agree	2.Neutral	3.Disagree
<b>4.</b> Formula-feeding ensures optimal health for the mother.	1.Agree	2.Neutral	3.Disagree
<b>5.</b> Feeding formula is modern way of infant feeding.	1.Agree	2. Neutral	3. Disagree
<b>6.</b> Formula feeding decreases strain on my family/ personal life.	1.Agree	2.Neutral	3.Disagree
<b>7.</b> Feeding your infant formula makes you feel guilty.	1.Agree	2. Neutral	3.Disagree
<b>8.</b> Formula feeding protects your body.	2.Agree	2.Neutral	3.Disagree



**Annex-VI Amharic version Questionnaires (የአሜሪካ ምርመራ)**

ክፍል 1 :- እናቶች እና ህፃናት ማህበራዊና አኗኗር ሁኔታዎች መረጃ

ተ.ቁ	ጥያቄዎች	ምሳሌዎች	ዝላቋ
101	እድሜዎ ስንት ነው?	1. _____ ዓመት 2. አላወቀውም	
102	የጋብቻ ሁኔታ?	1. ያገባች 2. ያላገባች 3. የተፋታች 4. የሞተባት	
103	የት/ት ሁኔታ?	1. ማንበብና መጻፍ ማትችል 2. ማንበብና መጻፍ ምትችል 3. የ 1ኛ ደረጃ ት/ት የተማረች 4. የ 2ኛ ደረጃ ት/ት የተማረች 5. የ ከፍተኛ ት/ት የተማረች	
104	ሃይማኖት?	1. ኦርቶዶክስ ተዋህዶ 2. ፕሮቴስታንት 3. ሙስሊም 4. ሌላ (ጥቅሱ)-----	
105	የመኖሪያ አካባቢ?	1. ከተማ 2. ገጠር	
106	የስራ ሁኔታ?	1. የግልተቀጣይ 2. የመንግስትተቀጣይ 4. የቀንሠራተኛ	

		<p>5.ነ ጋዴ</p> <p>6.ገበሬ</p> <p>7.የቤትአመጫ</p> <p>8.ሌላ (ጥቀሺ)-----</p>	
107	የባለቤትዎ የትምህርት ደረጃ?	<p>1.ማንበብና መጻፍ የማትችል</p> <p>2.ማንበብና መጻፍ የምትችል</p> <p>3.የ 1ኛ ደረጃ ት/ት የተማረች</p> <p>4.የ 2ኛ ደረጃ ት/ት የተማረች</p> <p>5.የ ከፍተኛ ት/ት የተማረች</p>	
108	የባለቤትዎ የስራ ሁኔታ?	<p>1.የግል ተቀጣጫ</p> <p>2.የመንግስት ተቀጣጫ</p> <p>3.የቀንሠራተኛ</p> <p>4.ነ ጋዴ</p> <p>5.ገበሬ</p> <p>6.ሌላ (ጥቀሺ)-----</p>	
109	የህፃኑ እድሜስን ትነው?	_____ ወር	
110	የህፃኑ ፆታ?	<p>1.ወንድ</p> <p>2.ሴት</p>	
111	ህፃኑ ስንተኛ ልጅ ነው?	-----ኛ	
112	ባሁኑ ህጻንና ከዚህ በፊት በተወለደው ህጻን መካከል ያለ የእድሜ ልዩነት	-----አመት	
113	የተወለደው ህፃን ያለው የክብደት ግምት?	<p>1.ዝቅተኛ</p> <p>2.ተመጣጠኝ</p> <p>3.ከፍተኛ</p>	
114	በመጨረሻው እርግዝና የተወለዱ	1.አንድ	

	የልጆች ብዛት?	2.ሁለት 3.ሌላ ካለ-----	
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የቤተሰቡ የማህበራዊ እና ኢኮኖሚያዊ (wealth index) እንዲሁም የቤት ሁኔታ

**ሀ. ቋሚያዎች እቃዎች (Assets)**

ተ.ቁ	ጥያቄዎች	ምላሾች
201	የምትኖሩበት ቤት የማን ነ ወ?	1.የግላችን 2. የከራይ 3. ሌላ ካለ(ይገለጽ)
202	የቤቱ ግድግዳ ከምን የተሰራ ነ ወ?	1. ሲማንቶ/ብሎኬት 2. እንጨት እና ጭቃ 3.ሌላ-----
203	የቤቱ ጣራ የተሰራውከምን ድን ነ ወ?	1.ከስሜቶ/ኮነ ክሪት 2.ከቆርቆሮ 3.ሌላ ካለ-----
204	የቤቱ ወለል የተሰራውከምን ድን ነ ወ?	1.ጭቃ 2.አሸዋ 3.ስሜንቶ 4.ሴራሚክ 5.ሌላ ካለ-----
205	መኝታ ቤታችሁ ለብቻ የተከፈለ ነ ወ?	1.አዎ 2. የለም
206	ከሽና ቤታችሁ ለብቻ የተከፈለ ነ ወ?	
207	እንስሳት ቤታችሁ ለብቻ የተከፈለ ነ ወ?	1.አዎ 2. የለም

208	ሽንት ቤታችሁ ለብቻ የተከፈለ ነው?	
209	የሚከተሉት እቃዎች ቤትዎ ወስጥ ካሉ ይንገሩኝ	1.ኤሌክትሪክ? 2.ሰዓት? 3.ራዲዮ 4. ቴሌቪዥን 5.ሞባይል ስልክ 6. የቤት ስልክ 7. ፍሪጅ 8. ወንበር? 9. ሶፋ? 10. ጠረጴዛ? 11.አልጋእና የጥጥ/የ ስፖንጅ/ 12.ኤሌክትሪክ ምጣድ/ስቶቭ? 13.ሶላር
210	ከቤትሰቡ የሚከተሉት እቃዎች አሉ? (ብዙ መልሶችን መመለስ ይቻላል፡፡)	1.ሳይክል 2.ሞተር ሳይክል 3.ጋሪ 4.መኪና
211	የቤት እንስሳት አለ ወይ?	1.አለ 2. የለም
212	አለ ካሉምን ያህል የቤት እንስሳት አሉ?	1.የ ወተት ላም..... 2.በሬ/ወይፈን----- 3.ዶሮዎች----- 4.ፍየ ሎች----- 5 በጎች----- 6.አህያ/በቅሎ-----

		7.የንብቃት----- 8.ሌላካለ-----
213	ቤታችሁ የእርሻ ቦታ አለዎት?	1.አዎ-----ኔክታር/ቃዳ 2.የለም
214	መልስዎ የለም ከሆነ ምርት የሚገኝ ፍትህ እንዴት ነው?	-----
215	በአመት ምን ያህል ኩንታል ታመር ታለህ?	1.በቆሎ----- 2.ጠፍ----- 3.በርበሬ----- 4.ሌላ ካለ-----
216	የምትጠቀሙት የመጠጥ ወሃ ምን ጨክቶት ነው?	1.የቧንቧ ወሃ ቤት ወስጥ 2.የቧንቧ ወሃ ከቤት ወጭ 3.ከህዝብ ቧንቧ 4.ከጉድጓድ 5.የተጠበቀ ጉድጓድ/ምንጭ 6.ያልተጠበቀ ጉድጓድ/ምንጭ 7.ሌላ ካለ-----
217	የምትጠቀሙት ሽንት ቤት ምን አይነት ነው?	1.በወሃ የተሰራ ሽንት ቤት 2.አየር ማሽን ወይም የለው ሽንት ቤት 3.መቀመጫ የለው ጉድጓድ 4.መቀመጫ የሌለው ጉድጓድ 5.ዛፍ ስር /ማዳ ላይ 6.ሌላ ካለ _____
218	ምግብ ለማበሰል የምትጠቀሙት የሀይል ምን ጭምን ድን ነው?	1.ኤሌክትሪክ 2.ከሰል 3.የጋዝ 4.ባዮጋዝ

	5.እነ ጩት 6.ሌላ _____
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**ክፍል 3:- የእናት የእርግዝና እና የጠፍ አገልግሎት ማገኘትን በተመለከተ**

ተ. ቁ	ጥያቄዎች	ምላሾች	ዝላል
301	ምን ያህል ልጆች አሉሽ?	-----ልጆች	
302	ምን ያህል ጊዜ ነ ፍሰ ጠፎ ሆነ ሽ ታወቁያለሽ?	-----	
303	በእርግዝናሽ ጊዜ የቅድመ ወሊድ ክትትል በጠፍ ማኬከል ተከታትለሽ ነ በር (ለመጨረሻውልጅ)	1.አዎ 2. የለም	
304	ለጥያቄ ቁጥር 301 መልስሽ አዎ ከሆነ ምን ያህል ጊዜ የቅድመወሊድ ክትትል አደረግሽ?	-----	
305	ቅድመወሊድ ክትትል ያደረግሽውየት ነ ወ?	1.የ መንግስት ጠፍ ተቋም 2.የ ግል ጠፍ ተቋም 3.ሌላ ካለ----	
306	ስለ ጠቅ ማጥባት ምክር ተሰጥቶሽ ነ በር?	1.አዎ 2.የለም	
307	ልጅዎን የወለዱት የት ነ በር?	1.የ መንግስት ጠፍ ተቋም 2.የ ግል ጠፍ ተቋም 3.በቤት ወስጥ 4.ሌላ ካለ----	
308	ልጅዎን የወለዱት በምን መልኩ ነ ወ?	1.በ ማህፀን በኩል ያለ ምንም መሳሪያ	

		2.በሆዴ በኩል በቀድሞ ገና	
309	ከወሊድ በሁዋላ ክትትል አድርገሻል?	1.አዎ 2.የለም	

**ክፍል 4: - የህጻናት ጤና አመገብን በተመለከተ**

<b>ሀ. ጤና ወተትን በተመለከተ</b>			
401	ልጅሽን ጤና አጥብተሽ ታወቁያለሽ?	1.አዎ. 2.የለም	
402	በተወለደ በምን ያህል ሰዓት ውስጥ ነበር ጤና ያስጀመርሽዎ?	1.በአንድ ሰዓት ውስጥ 2.በአንድ ቀን ውስጥ 3.በሶስት ቀን ውስጥ 4.ከሶስት ቀን በኋላ	
403	ልጅሽ አሁንም ጤና አይጠብ ነው?	1.አዎ. 2.የለም	
404	ህጻኑ የመጀመሪያውን የጤና ወተት ተመግቧል?	1.አዎ. 2.የለም	
405	ካላጠበሸው ምክንያትሽ ምን ነበር?	1.ህጻኑ መጥባት ስላልቻለ 2.ለህጻኑ ጥሩ ስላልሆነ 3.በባህላችን ስለማይጠብ 4.ሌላ ካለ-----	

<b>ለ. የዳጌት ወተትን መመገብን በተመለከተ</b>		
ተ. ቁ	ነ ጥበቻ	ምላሾች

406	ስለ ዳቄት ወተት ሰምተሽ/ አይተሽ ታወቂያለሽ?	1.አዎ 2.የለም
407	ካየሽ /ከሰማሽ ስለዳቄት ወተት ምን አይነት መልዕክት ነበር የሰማሽዎ?	1.ዳቄት ወተት ለህጻኑ እድገት ጥሩ ነው 2. ዳቄት ወተት ለህጻኑ ወብት ስለሚጠጥ 3.ለህጻኑ የአእምሮ እድገት ጥሩ ስለሆነ 4. የጠቅ ወተትን ይተካል 5. ሌላ ካለ-----
408	ከየት ነበር የሰማሽዎ?	1.ከሬድዮ/ከቲቪ 2.ከጠፍ ባለመዎች 3.ከሱፐር ሜኬት 4.ከቤተሰብ/ጓደኛ 5.ሌላ ካለ-----
409	ለዚህ ህጻን የዳቄት ወተት ሰጠሽው ታወቂያለሽ?	1.አዎ 2.የለም
410	ህጻኑ በተወለደ በስንተኛው ቀን ነው የዳቄት ወተት የጀመረው?	-----
411	ከስጠሽው ለመስጠት ምክንያት ምን ነበር?	1.ጠቁ በቂ አልነበረም 2. በእኔ ህመም ምክንያት 3.በህጻኑ ህመም ምክንያት 4.ጠቅ ለማጥባት ጊዜ ስለሌለኝ 5.የጠቅ ወተትን ስለማይተካ 6.የዳቄት-ወተት ከጠቅ የጠሻለ ስለሆነ 7.ሌላ ካለ-----
412	በአሁኑ ሰዓት የዳቄት ወተት እየወሰደ ነው?	1.አዎ 2.የለም
414	ልጅዎ የዳቄት ወተት የሚጣብ ከሆነ ከየት ነው?	1.ከፋርማሲ



	የምታገኝ ወ/የምትገኝዎት?	2.ከሱፐር ማርኬት 3.ከቤተሰብ/ጓደኛ 4.ከጠፍ ባለሙያዎች 5.ሌላ ካለ ይገለጽ.....
415	ከዚህ በፊት ለተወለደ ልጅ የዳቄት ወተት ሰጠሽ ነበር?	1.አዎ 2.የለም
416	ሰዎች የዳቄት ወተት እንዲጠቀሙ ትመክሪያለሽ?	1.አዎ 2.የለም
417	ስለ ዳቄት ወተት የጎንዮሽ ጉዳት ታወቁያለሽ?	1.አዎ 2.የለም
418	መልስሽ አዎ ከሆነ ብትጠቅሽልኝ?	-----
419	ለእናቶች የሚሰጠው የወሊድ ፈቃድ በቂ ነው ብለሽታስቢያለሽ?	1.አዎ 2.የለም
420	ቤተሰቦችሽ የዳቄት ወተት እንደተጠቀሙ ይገፋፋሽ ነበር?	1.አዎ 2.የለም

**ክፍል5: -እናቶች ስለ ጠት ወተት ጥቅም ያላቸው ግንዛቤና ስለዳቄት ወተት ያላቸው አመለካከት ለመለካት የተዘጋጀ መጠይቅ**

ለእናቶች ስለጠት ማጥባት ያላቸው ግንዛቤ	
ነጥቦች	መልስ
1. ለ6 ወር የጠት ወተት ብቻ ማጥባት ለህጻኑ በቂ ነው :	1.አወነት 2.ሀሰት 3.አላወቅም

2. የጠቅ ወተት ማጥባት ህጻኑን ከበሽታ ይከላከላል፡፡	1.አወነት 2.ሀሰት 3.አላወቅም
3.አርቲሬሻል ወተት መጣብ ከዋጋ አንጻር ወድነው፡፡	1.አወነት 2.ሀሰት 3. አላወቅም
4. የጠቅ ወተት የተሟላ የምግብ ይዘት አለው፡፡	1.አወነት 2.ሀሰት 3. አላወቅም
5. የጠቅ ወተት የእናትና ልጅ ቅርርብ ይፈጥራል፡፤	1.አወነት 2.ሀሰት 3. አላወቅም
6. የጠቅ ማጥባት እርግዝናን ለመከላከል ይረዳል፡፤	1.አወነት 2.ሀሰት 3. አላወቅም
7.የጠቅ ወተት ከአርቲሬሻል ወተት የተሻለ ጥቅም አለው፡፡	1.አወነት 2.ሀሰት 3. አላወቅም
<b>ሀ. እናቶች ስለዳቄት ወተት ያላቸውግንዛቤ</b>	
ነጥቦች	መልስ
1.ዳቄት ወተት ለህጻናት ጤና አስተማማኝ ነው፡፡	1.አስማላሁ 2. ሀሳብ የለኝም 3.አልስማምም.
2.የዳቄት ወተት ህጻናት ከመጠን ያለፈ ክብደት እንዲኖራቸው ያደርገልኝ፤	1.አስማላሁ 2. ሀሳብ የለኝም 3.አልስማምም.

3. የዱቄት ወተት ህጻናትን ለመመገብ ከጠቅ ይልቅ አመቺ ነው፡፡	1.እስማላሁ	2. ሀሳብ የለኝም	3.አልስማማም.
4.የዱቄት ወተት ለእናት ጠፍ ወሳኝ ነው.	1.እስማላሁ	2. ሀሳብ የለኝም	3.አልስማማም.
5. የዱቄት ወተት ህጻናትን መመገብ ዘመናዊነት ነው፡፡	1.እስማላሁ	2. ሀሳብ የለኝም	3.አልስማማም.
6. የዱቄት ወተት የእናትንም ሆነ የቤተሰብ ጭን ይቀንሳል፡፡	1.እስማላሁ	2. ሀሳብ የለኝም	3.አልስማማም.
7.የዱቄት ወተት ህጻናትን መመገብ የጥፋተኝነት ስሜት ይፈጥረብኛል፡፡	1.እስማላሁ	2. ሀሳብ የለኝም	3.አልስማማም.
8. ዱቄት ወተት ህጻናትን መመገብ የሰውነት አቋምን ለመጠበቅ ይረዳል፡፡	1.እስማላሁ	2. ሀሳብ የለኝም	3.አልስማማም.

አመሰግናለሁ!!