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Could Week recall be accurate measurement of Exclusive Breastfeeding among infants less than 6 months of agein Butajira Ethiopia, 2018?

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List of Abbreviations andAcronyms

EBF-Exclusive breast feeding

EDHS- Ethiopian Demographic and Health survey

FMOH- Federal Ministry of Health

HDSS - Health and Demographic Surveillance Site

HSDP- Ethiopian Health Sector Development Program

IYCF- Infant and young Child Feeding

ORS- Oral Rehydration Solution

PBF-Predominant Breastfeeding

ROC - Receiver Operating Characteristics

SNNPR- Nationalities and Peoples Regional State

UNICEF- United Nation International Children EmergencyFund

WHO- World Health Organization

Abstract

Background:WHO has developed an indicator to measure exclusive breastfeeding using 24 hoursrecall. This single day indicator doesn't capture the usual feeding history which may lead to exaggeration of exclusive breastfeeding rateand misclassification of infants as being exclusively breastfed where infact the infant is not. This indicates the need to look for an indicator which could provide better information on the actual breastfeeding practice.

Objective: To assess the validity ofweek recall in estimating exclusive breast feeding rate when compared to cumulative result of14repeated 24 hour recall among infants less than 6 months of age in Butajira, Ethiopia.

Method: Community based cross sectional study was conducted among 408 mother infant pair less than 6 months of age in ButajiraHDSS. Data on Exclusive breastfeeding practice was collected using 24 hour recall, and short period recalls for 14 consecutive days. Short period recalls was conducted starting from the second day to the last day of interview. During short period recall interview, mother was asked to recall 48 hour feeding practice, 72 hour feeding practice, 96 hour feeding practice and so on until the last day of interview. Data was entered by using Epi data software version 3.2 and exported to STATA for analysis. Estimation of the prevalence of exclusive breastfeeding was done using the methods. McNemar test was done to assess if there was significant difference in EBF rate between the methods. P-value of <0.05 was considered to indicate a significant difference in prevalence. Sensitivity, specificity and positive predictive value was computed to check the validity on the performance of each method in estimating Exclusive breastfeeding prevalence against the cumulative of 14 repeated 24 h recall.

Result: The highest prevalence of exclusive breastfeeding (71.4%) was obtained when single 24 hour recallwas used. 14 repeated 24 hour recall resulted in EBF rate of 47.31%. Taking 14 repeated 24 hour recall as a reference, the lowest discrepancy (6.9%)obtained was from 7 days recall.Seven day(week) recall also reflected EBF practices with sensitivity of 96.7% and specificity of 83.5%.

Conclusion: Current EBF status based on 24 hour EBF recall does not accurately represent the feeding pattern. Week recall had high specificity and presented a prevalence that is close to gold standard methodindicating it could be an alternative method to assess EBF practice.

1. Introduction

1.1 Background

Breastfeeding is the foundation of good nutrition that is ideal for healthy growth and development of infants(1).It is the way of providing young infants with all the necessary nutrients needed for their age through breast milk. According to WHObreast feeding should be initiatedwithin the first one hour after birth, and continued for the upcoming 24 months where by the first 6 months exclusively and the remaining months with complementary foods (2).

Exclusive breastfeeding has been well-recognized as an important public health tool for the primary prevention of child morbidity and mortality(3). It has profound impact on a child's survival, health, nutrition and development by providing all the necessary nutrients, hormones and antibodies. Protections against gastrointestinal infections and allergy are among the chief benefits of breast feeding (1).

An infant is said to be exclusively breastfed when it receives only breast milk which could be directly from the mother, wet nurse or expressed, with no other liquids or solids are given, not even water, with the exception of oral rehydration solution, or drops/syrups of vitamins, minerals or medicines(2).

The World Health Organizationrecommend the use of a defined list of indicators to standardize data collection, analysis and making comparisons between different nations regarding child feeding practice(4). Indicators that are valid, reliable and simple are important to improve health and nutrition of population by paving away to the right action(4). Infant and young child feeding practice indicators are one of the indicators to assess feeding practices since these practices are the major determinants of nutritional status and health of a child (5). These indicators will help to identify the risk groups with nutritional problem, Monitoring or evaluation of interventions that are designed to change practices(6).

Exclusive breastfeeding (EBF) is one indicator which is defined as the proportion of infants less than 6 months of age who are fed exclusively with breast milk for the past 24 hours. This specific indicator is based on current status data derived from 24 hour recall of how the child was fed(7).

1.2 Statement of the Problem

To identify the rate of Exclusive breast feeding WHO developed an indicator which is conducted by asking the mothers with infants less than 6 months of age what they fed their child in the previous 24 hour. It is the proportion of infants less than 6 months of age who are exclusively breast fed in the past 24 hours(7).

This indicator is based on a current status data that is a recall of previous day which reduces the risk of recall biasand is simple to use(6, 8). However the information obtained from the indicator is a single day feeding practice which could not capture the usual feeding historyand fails to take into account the possibility that many infants may have received other drinks or foods earlier(9). This may lead to overestimation and exaggeration of how prevalent exclusive breast feeding actually issince it only shows one day feeding practice(10).

Single day dietary information could not represent the entire feeding history and may mislead in determining a usual infant intake if there is day to day variation in feeding pattern. This can lead to misclassification of the infant as exclusively breast fed where in fact the usual feeding history is otherwise(5).This misclassification and discrepancy between the information we get from the indicator and the actual prevalence can lead to undermining the need for activities to tackle the challenges on breast feeding strategieswhich is very dangerous as the potential to further improve rates of EBF will not be addressed(11).

In previous study done to evaluate the accuracy of 24 hour recall in comparison with seven repeated days recall it was found that the 24 hour recall overestimated the prevalence of EBF practice by 23.5% and stated that the degree of overestimation could be decreased significantly by increasing the observation days of EBF practice(12). Seven repeated day recall is better than the 24 hour recall yet it is not practical since this method won't be feasible and economical for large scale studies. The study suggested that a week recall could be an alternative indicator to single 24 hour recall. Further validation work of the seven days recall method was recommended in order to test how accurately this method could estimate the real practice of EBF. Hence the accuracy of week recall and other alternative methods like the optimal days of recall which could give us valid information on the true practice of EBF still is needed to be checked.

1.3 Rationale of the Study

It is important to have clarity on the methods of assessment and to have a tool which could provide accurate information on the real practice of exclusive breast feeding. Even though 24 hour recall is the method of assessment used currently it doesn't capture the usual feeding pattern.This may leadto misclassification of infants as being exclusively breastfed where infact the usual activity is otherwise.

Thus the present study assessednumber of days of recallinorder to find a valid method that reveals actual practice.This has helped to search for other possible alternative assessment methodsinorder to provide better information and understanding on exclusive breastfeeding status. It also has a role in improving monitoring and evaluation of breastfeeding practice.

2. Literature

2.1 Breastfeeding

Breastfeeding is an essential component of infant and child survival that gives the healthiest start in life[(1)].Breast milk is the main source of nutrients meeting all the nutritional requirements of an infant in the first half year of life and remains an important source of calories and nutrients even after 6 months of age. It provides all of the nutrients including vitamins and minerals that fulfil infant needs for growth in the first six months with no other liquids or food [(3)].

WHO recommended that every child under the age of 6 month should be exclusively breast fed since it is beneficiary for both the child and the mother. Exclusive breast feeding has profound impact on a child's survival, health, nutrition and development. Breast milk carries antibodies from the mother that is protective against gastrointestinal infections and help to combat other disease. The act of breastfeeding itself stimulates proper growth of the mouth and jaw, and secretion of hormones for digestion and satiety. In additionbreastfeeding creates a special bond between mother and child and this interaction has positive repercussions for life, in terms of stimulation, behaviour, speech, sense of wellbeing and security and how the child relates to other people. It is also identified that it has an effect on cognition and lowers the risk of chronic conditions later in life[(1)].

Recommendations stated that an infant should be put on the breast within one hour after birth, be exclusively breast fed for the first 6 month and for additional 18 months or longer, be breast fed along with complementary foods[(2)].Implementing these recommendations could potentially save 1.45 million children's lives each year[(13)]. And according to the lancet 2013 series the risk of mortality and morbidity increases due to deviations from present breast feeding recommendation that suboptimal breast feeding could result in 800,000 deaths of children [(14)]. Globally about half of children younger than 1 month and three in every ten children aged 1-5 month is exclusively breast fed except Eastern Europe countries where the rate of breast feeding is lower. Breast feeding practice among 6-23 month children is higher in Africa (77%) followed by Asia and Latin America[(13)].

2.2 Breastfeeding Rate and Duration

Bearing in mind the all rounded benefit of breast feedingseveral activities and efforts have been carried out worldwide to increase the rate of exclusive breast feeding. However these efforts have failed to bring about significant and sustainable changes especially in developing countries(15). Sub-optimal breastfeeding practices in-particular exclusive breastfeeding (EBF) still prevail in many developing countries including Ethiopia, despite the documented evidence on the vital role of breastfeeding on the health and development of infants.

According to WHO report only 43% of children younger than 6 months are breastfed exclusively[16]and only 23 countries have rates of exclusive breastfeeding of over 60% globally[2].The developing countries contribute only 38% of the prevalence.When we come to Ethiopia the government has tried to create supportive and enabling environment through appropriate policy and strategies to ensure that children are protected from the health problems resulting from malnutrition[17, 18]. The federal ministry of health has published a strategy and set targets to increase exclusive breast feeding practices among infants less than6 months of age(17). In addition it has been trying to enhance the practice of breast feeding by developing manuals, implementing guidelines and promoting on breast feeding. The health extension program is one of the tools being used to promote and council on the benefits and importance of breastfeeding in addition to ANC and PNC service[8]. The program has shown progress even though the practice of breast feeding still remains far from HSDP (IV) plan which was to increase the proportion of exclusively breastfeeding infants under the age of six months to 70% by the end of 2015(18).According to the 2016 EDHS data approximately 52% of women reported initiating breastfeeding within one hour of delivery and 58% of infants less than 6 month of age are exclusively breast fed.Contrary to recommendation by WHOthose children under age 6 months should be exclusively breastfed, 17 % of infants 0-5 months consume plain water, 5% consume nonmilk liquids or other milk, and 11 % consume complementary foods in addition to breast milk. 5% of infants under age 6 months are not breastfed at all. The percentage exclusively breastfed decreases sharply with age from 74 percent of infants age 0-1 month to 64 percent of those age 2-3 months and further to 36 percent of infants age 4-5 months(19).

The level of exclusive breast feeding remains insufficient due to different contributory factors. Thus traditional and cultural beliefs are the leading ones(20).Early use of water and substitute feeds commonly interfere with the initiation and success of breastfeeding. Any food provided to a newborn before the initiation of mother's breastfeeding is considered to be a pre-lacteal feed [(21)].The use of pre-lacteal feeds is a big problem in many areas of the world[(12)] including Ethiopia[(22, 23)].These pre-lacteal feeds are one of the traditional values practiced by majority of the community members, especially in the rural part of the country. According to the EDHS the percentage of newborns who received pre-lacteal feeding in Ethiopia were 27% which was higher in Amhara region that almost half of the children received pre-lacteal feeds[(19)]. Different studies have been conducted to evaluate the prevalence pre-lacteal feeding. A study conducted in 4 regions of the country found that 12.4% mothers feeding their newborns food or liquid other than breast milk in the first two days [(23)].Another survey conducted in Tigray enderta has shown that the rate of exclusive breast feeding is 70% where the practice of pre-lacteal feeding is 12.8 % [(22)].

2.3 Measurement of Breastfeeding

Breastfeeding has been a common feature of all cultures since the survival of mankind has been dependent upon this behavior (24). Referable to the primordial importance of breastfeeding the WHO proposed a set of criteria and indicators for analyzing infant feeding practices aiming at standardizing data collection, analysis and making comparisons between different national and international studies possible (4). Three out of the eight core indicators are directly related to the practice of breast feeding(25). These include:

Early initiation of breastfeeding- Proportion of children born in the last 24 months who were put to the breast within one hour of birth

Exclusive breastfeeding -Proportion of infants 0–5.9 months of age who are fed exclusively with breast milk during the previous day

Continued breastfeeding -Proportion of children 12–15 months of age who are fed breast milk during the previous day

The recommended method of assessment to collect data on the exclusive breastfeeding indicator is 24-hour recall method that is all mothers with children less than 6 months of age would be asked the current age of the child and the kinds of food or fluids given during the previous 24-hours [(6)].The 24 hour dietary recall method required small number of questions in order to report against many indicators important for policy and practice the analysis and interpretation of data. Using 24 hour recall method is simple to use, require minimum level of training and reduces the risk of recall bias[(26)].Though the recommended and currently used method of assessment to collect data on breastfeeding categories is 24-hour recall the WHO itself warned that using the previous day recall period could cause overestimation of proportion of children being exclusively breastfed. This is because some infants who are given other liquids irregularly may not have received them in the day before the survey. This makes estimates of exclusive breastfeeding frequency biased [(9)]. Since the previous day recall fails to take into account the possibility that many infants may have received other drinks or foods earlier the validity of data on exclusive breastfeeding based on single 24-hour periods has been questioned[(27)].

2.4 Comparison of Point in Time data and Recall since Birth

Simplest yet most valid and reliable methods are important to measure child feeding practice. An important consideration when collecting data on feeding practices through recall is the time frame used for the recall and the related trade-offs between accuracy and representativeness of the information (9). Studies conducted using different methods to assess EBF practice showed discrepancies in the prevalence of EBF.

Different studies have been conducted using the "point in time data" and recall since birth methods.A point in time data has an advantage of minimizing the risk of recall bias since recall errors is smaller the shorter the recall period is,but may be is less representative of usual practices (9). On the other hand recall since birth may provide us a lifelong data by asking the mothers if any food or liquid is given other than breast milk and if so at what age it was introduced. The findings from the studies comparing the two have shownconsiderable difference. (11, 12, 28-30)

Among studies done comparing rate of exclusive breast feeding using approaches of 24 hour recall and recall since birth one conducted in Brazil among 306 mothers of children 0- 6 months

found a difference of 18.8% in the rate of exclusive breast between the two methods.The findings clearly designate that the 24 hour recall method of assessment overestimates the rate of exclusive breast feeding with a prevalence of 78%[28].Similarly a survey done in eastern Uganda using the same methods has founda difference that ranges 3-23% during 3 and 6 months of age between the two methods of assessment. The 24 hour recall gives higher estimates of exclusive breast feeding (81% and 52% at ages of 3 and 6 months respectively) when compared to recall since birth (7% and 0% at ages of 3 and 6 months respectively). There is a considerable difference between the 24-hourrecall and the dietary recall since birth. The difference between the two methods ranges from 51 to 74% in estimating the rate of EBF[29].

Another study conducted using the same methods has also showed a considerable discrepancy that the 24 hour recall method over estimates the proportion of infants breast fed exclusively (77%) compared to recall since birth (49.1%)[11].

A study in Guatemala was done using methods of 24 hour recall, current status and recall since birth to assess the rate of exclusive breast feeding. The results show that the estimate for EBF rates through the first semester of life vary depending on the interview method used which the rates range from 9% up to 56%. It was found that prevalence of exclusive breast feeding was 56%, 20% and 9% according to the previous day dietary recall, current feeding practices, and recall of feeding practices since birth methods respectively.Based on survey results at 6 months of life, the 24 hour recall method greatly and consistently overestimates the true prevalence of EBF through the firstsemester life[30].

Among other studies conducted questioning validity of 24 hour recall one was conducted by comparing 24 hour recall, multiple 24 hour recall and recall since birth in rural parts of Ethiopia. Results has shown that that the 24 hour recall overestimates the true prevalence of exclusive breast feeding by 23.54% compared to the seven repeated 24 hour recall(53.2%)(12).

2.5 Comparison of Point in Time Data and Longitudinal Study

The decision on which is the best indicator will depend on the purpose of the data being collected and the objective of the research because a point in time data tends to over-estimate while a longitudinal data tends to bring the data closer to the true value(10). Different studies have been conducted estimating the exclusive breast feeding rate comparing the discrepancies

between the data obtained by longitudinal and point in time. It is intelligible that prospective studies are likely to be more accurate but are too expensive to use in most surveys with larger sample size(10).Hence cross sectional design is a feasible alternative compared to prospective studies especially in resource limited settings (29).

A study done aiming to compare prospectively collected breastfeeding data with simulated cross sectional sample from the same population has provide information about the discrepancies between reported breastfeeding rates and actual breastfeeding practices.It has found that the cross-sectional prevalence using the "current status" method (56.2%) was 47.4 % higher than the actual (8.8%) exclusive breastfeeding prevalence calculated from prospectively-collected data(31).

One is done in South Africa using 3 methods of dietary assessment (48 hr recall, weekly recall and 6 month recall methods) has shown differences in findings of EBF. The result has shown that the data obtained from 48 hr recall doesn't accurately represent the lifelong feeding pattern with low specificity and positive predictive value of 65-89% and 31-48% respectively.The finding from 6 month recall was also equally poor. The data from week recall has reflected EBF practiceaccurately with high sensitivity (96%) and specificity (94%)(32).

Another longitudinal prospective study has stated that the 24 hour recall overestimate the overall rate of exclusive breast feeding compared to the prospective study. Using 24 hour recall and prospective study exclusive breast feeding rate was (92% versus 51%) at 2 months of age, (73% versus 30%) 4 month and (11% versus 1.8%) at 6 month of age. This clearly shows the 24 hour recall overestimates real prevalence[24].

A direct comparisonof feeding pattern assessed by single 24 hour recall and mothers' month recall showed significant disagreement between the two methods. Theone-day assessment overestimated exclusive breastfeeding rates among infantsyounger than 4 months by 25%[27] . Similar findings were obtained in an analysis of the EthiopiaDemographic and Health Surveys 2000, where even larger discrepancies were found among children 4–6 months old between the 24-hour recall and the 7-day recall method.The size of discrepancy increases in the 4-6 months of age group where the estimates of EBF based on the 24 hour recall is twice as high (36%) as that based on the 7 day recall (18%).Hence the discrepancies in estimates for infants less than 4 months of age are relatively small (4-6%)[33].This is mainly due to the day to day variation of

infant feeding practices with in short period of time rather than maternal recall is biased or inaccurate(5).

2.6 Accuracy of Maternal Recall in Assessing EBF

Information on exclusive breast feeding practice is often obtained from maternal recall even though the accuracy of data is a big concern especially in case when mothers are askedto recall their practice from many years earlier(26). The issue with maternal recall is the high probability of recall bias. It is suggested to use prospective studies to overcome this problem however it is not feasible or easy to conduct with large sample size or population level(26).To validate the maternal memory of breast feeding different studies have been conducted using different methods(34-37).

Among these studies one is done using 2 years recall after birth and data obtained prospectively throughout the first 6 months of life. It has reported that only 30% of the mothers have recalled the duration of EBF correctly that matched with the prospective data. According to the prospective study it is only 2 mothers who has breast fed their child exclusively for 6 month indicating inaccuracy of data obtained from maternal recall could be a source of error in the actual rate of EBF[(34)].

A systematic review on reliability and validity of maternal recall has found that the ability to recall the duration of breast feeding accurately is lower as the period of recall increases. It suggested that making the duration of recall short period (less than 3 years) could provide accurate estimate of initiation and duration of breast feeding[(35)].

On the other hand some studies stated that maternal recall could provide accurate information on duration of exclusive breast feeding.A study was done comparing data on EBF obtained from 20 years recall after following mother infant pair for one year post partum. The results have found a strong correlation between the two methods breast feeding duration suggesting that the mothers fair accurately recall how long they breast feed their child(36).

Another study done to validate maternal memory about breast feeding and sucking habit of child uses data of maternal recall collected along 36 months and 6 years recall. The result on breast feeding duration from the methods has high correlation suggesting maternal memories are valid[(37)].

3. Objective

3.1 General Objective

- To assess the validity of weekrecall as an alternative indicator of exclusive breastfeeding practice among infants less than 6 months of age in Butajira, Ethiopia 2018.

3.2 Specific Objective

- To identify the number of days of recall which gives optimal accuracywhen compared to cumulative result of fourteen repeated 24 hoursrecall
- To assess the validity of week recallin estimating exclusive breastfeeding rate when compared to cumulative result of fourteen repeated 24 hoursrecall

4. Methods

4.1 Study Area

The study was conducted in Butajira town Health and Demographic Surveillance site (HDSS) for School of Public Health, Addis Ababa University. Butajira is a town and separate woreda in south central Ethiopia. The Butajira DSS is located in Meskan and Mareko District, Gurage Zone, in the Southern Nations, Nationalities and Peoples Regional State (SNNPR) in Ethiopia. The area is located 130 km south of Addis Ababa and 50 km to the west of Zway town in the rift Valley, 8.2^{o}north latitude and 38.5^{o} east longitudes. The main ethnic grouping is Gurage. The Meskan, Mareko, Sodo, Siliti and Dobi are major tribal groups. Two-thirds of the people follow the Islamic religion, with Orthodox Christianity as the second dominant religion in the area. The major language is Guragigna with variations among different tribal groups. Amharic, the national language, is widely spoken in the area, and is also an important written language. The DSS covers are 9 rural and 1 urban kebele. Meskan woreda consists six of the kebeles namely Dirama, Shershera Bido, Bati, Dobena, MisrakMeskan and Wurib, whereas Mareko Woreda consists of Hobie and Mekakelegna Jare Demeka kebele. Dobena and Yeteker are the other two kebeles from Silite Zone and the Tenth kebele is Kebele 04 from Butajira Town(38).

The butajira HDSS conducts quarterly rounds of data collection on birth, death, marriage, new household, out-migration, immigration and internal movement.It is estimated that total number 1250-1400 of infants are born in a year which indicate around 312-350 infants less than 6 months of age could be identified in one of the quarterly data collection period in the DSS.

Study Period

The study was conducted March to April 2018 by trained data collectors.

4.2 Study Design

Community based cross sectional study

4.3 Populations

4.3.1 Source Population

All infant mother pair less than 6 months of age who resides in Butajira from March to April 2018 was the source population.

4.3.2 Study Population

Randomly selected infant mother pair aged less than 6 months who resides in Butajira from March to April 2018.

4.3.3 Inclusion Criteria

All mothers with their child of age less than 6 month who resides in Butajira and who were staying in the study area for the upcoming two weeks

4.3.4 Exclusion Criteria

A mother/ care taker who passed away or unavailable to breast fed the infant

4.4 Sample Size Determination

The Sample size was calculated using the sample size estimation formula for diagnostic tests(39): $n = \frac{[SLF \times \sqrt{\phi} + PF \times (\phi - d^2)^{1/2}]^2}{d^2}$

ϕ = probability of disagreement between the reference technique and contender technique

$d = P_2 - P_1$

P_1= specificity of reference technique/test

P_2= specificity of contender test

SLF= significance level factor corresponding to 95% CI

PL= power factor corresponding to a power of 80% = 0.84

- In this study :

  P_1= Specificity of repeated days recall = 90.7% (12) from the previous study the 5^{th} day recall specificity is taken since the difference is significant until the 5^{th} day)

  P_2= Specificity of short recalls = 92.7% (assuming the disagreement between the two techniques will be 2% and short recalls could give us a specificity of 92.7%)

  SLF=1.96

  PL= 0.84

  D= 92.7% - 90.7 = 2%

  $$N= \frac{[1.96 \times \sqrt{0.02 + 0.84\sqrt{(0.02-(0.02)^2)}}]^2}{(0.02)^2}$$

  = 390, adding the non-response rate of 5 % the total sample size obtained was 408

4.5 Sampling Procedures

All the 10 kebeles were included to fulfill the desired number of sample size. The Butajira DSS conduct quarterly visit to collect data on vital and related events. First the data on birth was obtained from these quarterly updated lists of data. From the obtained birth data mothers with a child less than 6 months of age were listed and sampling frame was constructed. The sampling frame provided information on infant birth date, age, sex and the mother's name, address (kebele, house number). Finally infant mother pair less than 6 months of age was selected from each kebele using simple random sampling technique using the sampling frame.

4.6Data Collection Tools and Procedure

4.6.1 Data Collection Instrument

A structured questionnaire was adopted from EDHS to collect data on socio economic demographic characteristics and for assessing Exclusive breastfeeding a structured questionnaire was adapted from WHO. Pretest was done on 5% of sample volenteres who were not included on the actual data collection.Based on the result from the pretest some modification was done to the questionnaire inorder to improve understandability. Certain fluid item that is commonly given to infants in the area, which previously was not in the questionnaire, was also added.

4.6.2 Data Collectors

Data collectors were recruited and training was given on sampling procedures, techniques of interview and data collection processby the primary investigator for two days.

4.6.3 Data Collection Procedure

Face to face interview was conducted by the trained data collectors using the questioners. Before starting the interview clear explanation on the purpose, benefit and risk of the study was given and informed consent was obtained from the mothers or caregivers. After obtaining the consent study participants were followed for 14 consecutive days. During the first day of interview information on infant characteristics (age and sex), maternal demographic and socioeconomic characteristics (age, educational status, marital status, occupation, and income) was collected which was not be repeated on the next days of data collection.

During the 14 days of follow up two different measurement approaches were employed, one to obtaindata for the gold standard (cumulative result of 14 days repeated 24 hour recall measurment)and the other to short period recalls (a recall over the period of a given number of days). Short recalls were conducted starting from the second day to the last day of interview. During short period recall interview, mothers were asked to recall 48 hour feeding practice, 72 hour feeding practice, 96 hour feeding practice and so on until the last day of the interview.

4.7 Operational Definition

Short period recall- A recall over the period of a given number of days

Reference method/Gold standard method - cumulative result of 14 days repeated 24 hour recall measurment

Sensitivity - the ability of the methods to correctly identify infants who are EBF

Specificity - the ability of the methods to correctly identify those who are not EBF

Positive predictive value - the test’s ability to correctly identify infants who are truly being exclusively breastfed

4.8Data Analysis Technique

The collected data was checked for its completeness and entered to EPI data 3.2 versions and was exported to STATA statistical software for cleaning and analysis. Univariate analysis was done using frequency, percentage and measure of central tendency (mean).

Socioeconomic status was determined by wealth index using PCA (principal component analysis). The following domain went into the model

1. Characteristics of the house including floor, wall, roof, type of toilet facility, source of water
2. Ownership of fixed assets like television, mobile, phone, refrigerator, clock, bed.
3. Main source of fuel for cooking
4. Ownership of agricultural land.
5. Ownership of animal including goat, chicken, sheep, donkey, ox, cow.

Cut off points were given for five equal groups and quintiles representing the poorest to the richest.

Estimation of the prevalence of exclusive breastfeeding was done using the information obtained from the methods multiple 24 hour recall and short recalls. The EBF prevalence estimated by taking all infants of age less than six months who received nothing but breast milk with the exception of medicine and oral rehydration salt as a numerator and all infants less than six months of age as a denominator.

The prevalence of exclusive breastfeeding from single 24 hour recall was obtained by adding all of the foods/drinks that the child might receive in the past 24 hour.If the sum of this list is zero infants were classified as being exclusively breastfed but if this sum is different from zero, they were classified as being non exclusively breastfed.

Prevalence of exclusive breastfeeding fromshort period recall was done by summing all of the foods/drinks that child might receive in the specified number of recall period (2days,3days, 4days, 5days, 6days, 7days, 8days, 9days, 10days, 11days,12days, 13days and 14days recall). If the sum of the items is zero infants were classified as being EBF but if the sum is different from zero they were classified as being non EBF.

Prevalence of 14 repeated 24 hour recall was obtained by adding all of the foods/drinks that the child might receive in fourteen consecutive repeated 24 hour recall. If the sum of this list is zero infants were classified as being exclusively breastfed but if this sum is different from zero, they

were classified as being non exclusively breastfed. Data obtained from this served as best comparison method.

McNemar test was done to evaluate whether significant difference in the prevalence of EBF practice is obtained from the different recall methods. P-value of <0.05 was considered to indicate a significant difference in prevalence. In order to check the validity on the performance of each method in estimating EBF prevalence against the corresponding best comparison (fourteen repeated days recall) Sensitivity which is the the ability of the methods to correctly identify infants who were EBF, specificitythe ability of the methods to correctly identify those who were not EBF, positive predictive value and negative predictive value were computed. Receiver operating characteristics curve was done to compare specificity of the different methods. Finally result was presented by using appropriate tables and graph.

4.9 Data Quality Management

Before data collection-A standardized questionnaire from WHO and EDHS was adopted. The questionnaire was prepared in English initially and translated in to Amharic later. Data collectors and supervisors were recruited and training was given on sampling procedures, techniques of interview and data collection process. Pretest of the questionnaire was done on 5% of sample volunteer mothers who were not included in the actual data collection. This was to check the consistency and understandability of the questionnaire by data collectors and to identify the local food/fluid items that are commonly given for a child in the area so that was included in the questionnaire as itemized check list later.

During data collection- As a way of data quality assurance data collection was made by using standardized questionnaire, training was given to the data collectors before the data collection period and also a recap/refresher training was provided in the middle. Rotation of data collectors, close follow up and supervision was also made to ensure completeness and consistency throughout the data collection period.

After data collection- the data completeness and consistency was rechecked before transfer into computer software. Non over lapping numerical code was given for each question and the coded data was entered into Epi data version 3.2 software prepared templates.

4.10 Ethical Considerations

Letter of ethical approval was sought before starting data collection from research ethics committee of school of Public Health Addis Ababa University. Written informed consent was obtained from respondents after clear explanation was given on the purpose, procedure, potential risks and benefits of participating and the right to withdraw from the study at any time throughout their interview. Confidentiality of study participants was assured and maintained by explaining, their answers will not be shared with anyone other than members of the study team. They were informed that they could stop or pass to the next during the interview process if they encounter any question they don't want to answer. The right of the respondents not to answer some questions or withdraw was respected. Each interview was conducted with strict privacy. Codes were used for identification purpose to maintain participants' trustworthiness of confidentiality.

4.11 Dissemination of Results

The finding of this study will be submitted and presented to school of Public Health College of health science Addis Ababa University. The result will be communicated to FMOH and Butajira HDSS. An attempt will be made to publish on national and international journals to communicate the finding.

5. Result

5.1 Demographic Characteristics

Of the total 408 mother infant pair recruited for this study initially 391 participated throughout the study yielding response rate of 95.8%. The remaining 17 mother infant pairs were lost to follow up. A total 181(46.29%) male and 210(53.7%) female infants participated in the study.Table 1 presents the socio demographic characteristics of the study population.The mean age of the infants was 3 month (±2.5SD) which ranged from 0-6month. The median age of the mothers was 28 years and large proportion (38%) belongs to the age group 25-29.Distribution of education status showed that 36.53% of women have never attended school. Majority of the mothers 315(80.56%) were housewives.

Table 1: Socio- demographic characteristics of mothers/care takers and infants Butajira HDSS,Ethiopia, 2018

Socio economic variables	Frequency	Percentage (%)
Infant's sex		
Male	181	46.29%
Female	210	53.71%
Infant's age		
0-1month	125	31.9%
2-3months	127	32.4%
4-5months	139	35.5%
Mother's age-		
15-19	11	2.8%
20-24	90	23%
25-29	149	38%
30-34	81	20.7%
35-39	47	12%
40-44	13	3.32%
Marital status		
Single	24	6.14%
Married	360	92.07%
Separated	7	1.8%
Education		
Illiterate	144	36.53%
Read & write	4	1.02%
Primary(1-8)	161	41.1%
Secondary(9-12)	60	24.29%
Higher*	22	8.9%
Occupation		
Housewife	315	80.56%
Merchant	32	8.18%
Government employee	17	4.35%
Farmer	27	6.9%
Wealth index		
Lowest	79	20.15%
Low	79	20.15%
Middle	78	19.90%
High	77	19.64%
Highest	78	19.90%

Higher * includes higher education and technical and vocational education

5.2 Exclusive Breastfeeding Practice

The breastfeeding experience was universal among the mothers participated in the study. Exclusive breastfeeding practice was assassed using short period recalls and multiple 24 hour recalls. It was found the estimates of exclusive breast feeding varied among the different methods used.

Multiple 24 hour recalls

Exclusive breastfeeding practice using 24 hour recall was conducted for 14 cosecutive days. It was observed that the estimates of exclusive breastfeeding varied across these different multiple 24 hour recall methods used. The highest prevalence was found from 2 multiple 24 hours recall method (62.66%) which was followed by 3 multiple 24 recall (56.27%). The lowest prevalence (47.3%) was obtained from the 14 days multiple recalls. The data on exclusive breast feeding prevalence obtained from this method showed a decreasing pattern as the number of days of observation increased.

Table 2: Exclusive breast feeding (EBF) prevalence using multiple 24 hour recalls, ButajiraHDSS, Ethiopia, 2018 (n=391)

Multiple days recalls	*Frequency*	*EBF percentage (95% CI)*
2multiple	245	62.66[57.8-67.4]
3 multiple	220	56.27[51.3-61.2]
4 multiple	208	53.2[48.2-58.1]
5 multiple	205	52.43[47.4-57.4]
6 multiple	199	50.90[45.9-55.8]
7 multiple	196	50.13[45.1-55.1]
8 multiple	193	49.36[44.3-54.3]
9 multiple	191	48.84[43.8-53.7]
10 multiple	190	48.59[43.6-53.5]
11 multiple	190	48.59[43.6-53.5]
12 multiple	188	48.08[43.1-53.1]
13 multiple	186	47.57[42.5-52.5]
14 multiple	185	47.31[42.1-52.1]

Short period recalls

Using short period recalls the practice of exclusive breastfeeding was assessed by asking the mothers to recall 48 hour feeding practice, 72 hour feeding practice, 96 hour feeding practice and so on until the last day of the interview. Using these methods the prevalence of EBF ranges from 54.24 to 71.4%. The highest prevalence of EBF using short period recalls was observed from single 24 hour recall (71.4%) which is followed by EBF practice based on 2 days recall (64.45%). The seventh day recall showed the lowest prevalence of EBF practice (54.24%). The magnitude of EBF decreased as the number of days of observation increased until the 7^{th} day and starts to rise again as the recall period increases. Table 3 shows prevalence of EBF observed from the different short period recall methods.

Table 3: Exclusive breast feeding prevalence using short period recalls, Butajira HDSS, Ethiopia 2018

Short recalls	Frequency	EBF percentage (95% CI)
24hour recall	279	71.36[66.8-75.8]
2 days recall	251	64.45[59.4-68.9]
3 days recall	227	58.32[52.14-62.9]
4 days recall	223	56.52[52.1-61.9]
5 days recall	220	56.27[51.3-61.2]
6 days recall	213	54.4[49.5-59.4]
7 days recall	212	54.24[49.3-59.2]
8 days recall	218	55.5[50.8-60.6]
9 days recall	224	58.06[52.3-62.2]
10 days recall	236	60.87[55.4-65.2]
11 days recall1	241	61.64[57-66.7]
12 days recall	242	61.64[57-66.7]
13 days recall	244	62.92[57.5-67.2]
14 days recall	250	63.94[59.03-68.5]

5.3 Comparison between the Short recalls and Multiple 24 hour Recalls

Each data on EBF from short period recalls (the recall over the period of given number of days) was compared to the cumulative result of 14 repeated 24 hour recalls. A considerable difference was observed from the comparison made between these methods. The difference of EBF estimate between the methods ranges from 6.9-24.05%.The discrepancy between 24 hour recall and 14 multiple days recall in estimating EBF was found to be 24.05 (95% CI 19.5, 28.5). In other words one could conclude that 71.4% of infants were exclusively breast fed using 24 hour recall whereas if the cumulative assessments are taken into account this estimate is only 47.31%. Using 2 days recall EBF practice was estimated to be 64.45% whereas using cumulative result of 14 repeated 24 hour recalls it was only 47.31% infants who were exclusively breast fed.This prevalence of EBF lowers to 54.2% when the recall period extends to 7 days. Estimates of EBF obtained by seven days recall overestimate the prevalence by 6.9 %(95% CI 3.5, 10.2). The difference was statically significant since p-value was <0.001. Table 3 shows the patterns of change in the estimates of EBF prevalence obtained from short period recalls.

Another comparison was made between the multiple recalls.When the multiple recalls compared to the multiple 14 days recall the difference ranges 0.26-15.35%.By taking the 14 multiple days recall as a reference the overestimation from 2 multiple days recall and 3multiple days recall was 15.35% and 9.17% respectively.This overestimation significantly decreases as the number of observation increases.

Table 3: Patterns of changes in estimates of EBF prevalence between short period recalls and multiple 24 hour recall by using 14 days as reference, ButajiraHDSS, Ethiopia, 2018

Number of days to recall	EBF percentage (95% CI)	14 multiple recall (95% CI)	% of overestimation (95% CI)	McNemar's P-value
24hour recall	71.36[66.8-75.8]	47.31[42.3-52.2]	24.05[19.5-28.5]	<0.0001*
2 days recall	64.2[59.4-68.9]	47.31[42.3-52.2]	16.87[12.8-20.9]	<0.0001*
3 days recall	58.3[52.14-62.9]	47.31[42.3-52.2]	10.74[6.9-14.5]	<0.0001*
4 days recall	57.03[52.1-61.9]	47.31[42.3-52.2]	9.71[6.3-13.07]	<0.0001*
5 days recall	56.27[51.3-61.2]	47.31[42.3-52.2]	8.96[5.4-12.5]	<0.0001*
6 days recall	54.4[49.5-59.4]	47.31[42.3-52.2]	7.16[3.5-10.74]	<0.0001*
7 days recall	54.24[49.3-59.2]	47.31[42.3-52.2]	6.93[3.5-10.2]	<0.0001*
8 days recall	55.7[50.8-60.6]	47.31[42.3-52.2]	8.44[4.7-12.1]	<0.0001*
9 days recall	57.29[52.3-62.2]	47.31[42.3-52.2]	9.97[6.2-13.6]	<0.0001*
10 days recall	60.35[55.4-65.2]	47.31[42.3-52.2]	13.04[8.89-17.2]	<0.0001*
11 days recall1	61.89[57-66.7]	47.31[42.3-52.2]	14.57[10.2-18.9]	<0.0001*
12 days recall	61.89[57-66.7]	47.31[42.3-52.2]	14.57[10.2-18.9]	<0.0001*
13 days recall	62.4[57.5-67.2]	47.31[42.3-52.2]	15.08[10.8-19.3]	<0.0001*
14 days recall	63.94[59.03-68.5]	47.31[42.3-52.2]	16.62[12.2-21.0]	<0.0001*

* McNemar's test p value <0.05

The difference in exclusive breastfeeding rate was examined among the different age groups categorized. The proportion of infants who were exclusively breastfed decrease as the age of the infants incrases regardless of the method used. Using short period recalls the prevalence ranges 74.4-88% among 0-1 month age of infants, 60.63-81.8% among 2-3 month age of infantsand 29.5-46.7% among 4-5 month age of infants. Comparing with the cumulative result of 14 repeated 24 hour recall a significant overestimation was observed for the first and third age groups. Using seven days recall lowest overestimation of EBF was observed among the age category of 2-3 months and 4-5 months. The tendency of this seven days recall to overestimate EBF practice was 7.2% (95% CI 0.7, 12.02) among 0-1 month infants,6.29% (95% CI -0.1, 12.7) among 2-3 month age of infants and 7.19 (95% CI 1.13-13.05) among 4-5 month age of infants. This overestimation was found to be statistically significant among all the age groups except 2-3 months.

Table 5: Patterns of changes in estimate of EBF prevalence comparing14 multiple 24 hour recall and short period recalls among different age group, Butajira HDSS, Ethiopia, 2018

Age group(0-1 month(n=125)				
Recall period	**EBF percent(95% CI)**	**14 multiple days recall**	**% overestimation (95% CI)**	**McNemar test**
24 hour recall	88.0[80.9-92.6]	68.00%	20[12.12-27.8]	<0.0001*
2 days recall	80.8[72.8-86.8]	68.00%	12.8[6.1-19.4]	<0.0001*
3 days recall	75.2[67.6-82.06]	68.00%	7.2[0.8-13.5]	<0.0126*
4 days recall	74.4[65.9-81.3]	68.00%	6.4[0.7-12.02]	< 0.0114*
5 days recall	74.5[65.9-81.3]	68.00%	6.5[0.7-12.02]	< 0.0114*
6 days recall	74.4[65.9-81.3]	68.00%	6.4[0.7-12.02]	< 0.0114*
7 days recall	75.2[67.6-82.7]	68.00%	7.2[0.7-12.02]	< 0.0114*
8 days recall	76.8[68.4-83.4]	68.00%	8.8[2.1-15.4]	<0.0045*
9 days recall	76.8[68.4-83.4]	68.00%	8.8[2.1-15.4]	< 0.0045*
10 days recall	80[71.9-86.1]	68.00%	12[4.3-19.6]	<0.0011*
11 days recall	79.2[71.1-85.5]	68.00%	11.2[3.6-18.7]	<0.0017*
12 days recall	78.4[70.2-84.8]	68.00%	10.4[2.6-18.1]	<0.0046*
13 days recall	84[76.3-89.5]	68.00%	16[8.7-23.2]	<0.0001*
14 days recall	85.6[74.5-88.1]	68.00%	17.6[9.7-25.4]	<0.0001*
Age group(2-3 month(n=127)				
Recall period	**EBF percent(95% CI)**	**14 multiple days recall**	**% overestimation (95% CI)**	**McNemar test**
24 hour recall	81.8[12.2-25.9]	54.33%	27.5[19.00-36.11]	<0.0001*
2 days recall	71.65[63.1-78.9]	54.33%	17.32[9.6-25.04]	<0.001*
3 days recall	66.14[57.3-73.9]	54.33%	11.8[5.01-18.6]	<0.0003*
4 days recall	64.57[55.772.48]	54.33%	10.23[3.7-16.7]	<0.001*
5 days recall	64.57[55.772.48]	54.33%	10.23[3.3-17.1]	<0.0023*
6 days recall	61.42[52.6-69.5]	54.33%	7.08[0.5-14.11]	<0.029*
7 days recall	60.63[51.7-68.8]	54.33%	6.29[-0.1-12.7]	<0.0574
8 days recall	62.2[53.3-70.3]	54.33%	7.87[1.06-14.6]	<0.0213*
9 days recall	67.7[58.9—75.3]	54.33%	13.3[6.6-20.09]	<0.001*
10 days recall	66.93[58.2-74.6]	54.33%	12.5[5.26-19.9]	<0.0004*
11 days recall	69.29[60.6-76.7]	54.33%	14.9[6.9-23.01]	<0.0002*

12 days recall	66.93[58.1-74.6]	54.33%	12.5[5.26-19.9]	<0.0004*
13 days recall	66.14[57.4-73.9]	54.33%	11.8[4.2-19.4]	<0.0011*
14 days recall	70.8[59.8-76.1]	54.33%	16.5[8.5-24.4]	<0.0001*
Age group(4-5 month(n=139)				
Recall period	**EBF percent(95% CI)**	**14 multiple days recall**	**% overestimation (95% CI)**	**McNemar test**
24 hour recall	46.7[44.8-61.4]	22.3%	24.4[16.6-32.3]	<0.0001*
2 days recall	42.5[34.4-50.9]	22.3%	20.2[12.7-27.5]	<0.0001*
3 days recall	35.3[27.7-43.6]	22.3%	12.9[5.6-20.23]	<0.0003*
4 days recall	34.5[27.0-42.9]	22.3%	12.2[6.06-18.39]	<0.0001*
5 days recall	32.4[25-40.7]	22.3%	10.1[3.6-16.5]	<0.0013*
6 days recall	30.22[23.1-38.5]	22.3%	7.9[1.19-14.6]	<0.0192*
7 days recall	29.5[22.4-37.8]	22.3%	7.19[1.13-13.05]	<0.0192*
8 days recall	30.94[23.7-39.2]	22.3%	8.6[2.1-15.1]	< 0.0075*
9 days recall	30.22[23.1-38.5]	22.3%	7.9[1.5-14.29]	<0.0127*
10 days recall	36.69[29-45.1]	22.3%	14.3[6.8-21.8]	<0.0001*
11 days recall	39.57[31.7-48]	22.3%	17.3[9.3-25.1]	<0.0001*
12 days recall	42.45[34.4-50.9]	22.3%	20.2[12.4-27.8]	<0.0001*
13 days recall	39.57[31.6-48]	22.3%	17.3[9.3-25.1]	<0.0001*
14 days recall	38.13[28.3-44.4]	22.3%	15.8[7.8-23.8]	<0.0001*

* McNemar's test p value <0.05

5.4 Comparison of Sensitivity and Specificity of Different Methods used in Estimating EBF

In order to evaluate the ability of the methods in estimating exclusive breast feeding practice the estimate from the short period recalls were compared to the 14 multiple days recall. Table 6 shows the different methods of recalling EBF status against cumulative result of 14 repeated 24 hour recalls. The sensitivity, specificity, positive and negative predictive values, and area under roc curve for each comparison is documented. The meaning of sensitivity in this analysis is the ability of the methods to correctly identify infants who are EBF, while the specificity is the ability of the methods to correctly identify those who are not EBF. Positive predictive value is

the test's ability to correctly identify infants who are truly being exclusively breastfed. The data from single 24 hour recall showed low specificity (54.4%) and poor positive predictive value (66.3%) for the entire EBF history. In other words, some infants were classified as EBF from the 24 hour recall, when in fact the entire feeding history indicated that they had received fluids/feeds other than breast milk at some time. The two days recall has showed a sensitivity of 99.5% and specificity of 67.1% meaning that 2 days recall accurately identified those infants who had been exclusively breastfed but not true in identifying infants who had not been EBF when compared to 14 multiple 24 hours recall. The ability of the short period recalls to correctly identify those who are not EBF (specificity) tends to improve until the seventh day. Highest specificity and positive predictive value was found when seven days recallwas used. This shows seven days recall has a better ability in identifying those who are not exclusively breastfed and those who are truly being breastfed.

Table 6: comparison of short period recalls with 14 repeated days 24 hour recall as a reference in determining EBF, Butajira HDSS, Ethiopia, 2018

Test method	Sensitivity%	Specificity%	PPV%	NPV%	AUC
24 hr recall	100[98-100]	54.4[47.3-61.3]	66.3[60.4-71.8]	100[96.8-100]	0.77[0.74-0.81]
2 days recall	99.5[97-100]	67.1[60.3-73.5]	72.9[67.4-78.7]	99.3[96.1-100]	0.833[0.801-0.8]
3 days recall	96.7[93-98.8]	76.3[69.9-81.9]	78.4[72.5-83.6]	96.3[92.2-98]	0.865[0.834-0.8]
4 days recall	98.9[96.1-99.8]	80.2[74.1-85.4]	81.6[75.9-86.5]	98.8[95-99.9]	0.89[0.869-0.9]
5 days recall	97.3[93.8-99.1]	80.2[74.1-85.4]	81.4[76.1-86.7]	97.1[93.3- 99]	0.887[0.86-.919]
6 days recall	95.7[91.6-98.1]	82.1[76.1-87]	82.6[76.9-87.5]	95.5[91.3-98]	0.889[0.855-0.9]
7 days recall	96.7[93.0-98.8]	83.5[77.8-88.3]	84[78.4-88.7]	96.6[93-98.8]	0.901[0.8- 0.93]
8 days recall	96.2[92.3-98.5]	80.2[74-85.4]	81.2[75.4-86.2]	96.0[91.8- 98]	0.881[0.85-0.91]
9 days recall	96.7[93.0-98.8]	77.8[71.5-83.2]	79.5[73.6-84.6]	96.4[92-98.7]	0.87[0.84-0.906]
10 days recall	95.7[91.6-98.1]	71.0[64.3-77.1]	75.0[69-80.0]	94.8[90.1-7.7]	0.833[.801-.869]
11 days recall	95.7[91.6-98.1]	68.1[61.3- 74.4]	72.7[66.7-78.2]	94[89.7- 97.7]	0.82[0.78 -0.85]
12 days recall	96.2[92.3-98.5]	68.6[62-74.9]	73.1[67.1- 79]	95.3[90.6-98]	0.824[0.79-0.86]
13 days recall	97.3[93.8-99.1]	68.6[61.8-74.9]	73.4[67.3-78.8]	96.6[92-98.9]	0.829[0.79-0.86]
14 days recall	96.2[92.3-98.5]	64.7[57.8-71.2]	70.8[64.7-76.4]	95.0[90-98]	0.804[0.77-0.84]

PPV-Positive Predictive ValueNPV- Negative Predictive ValueAUR- Area Under roc Curve

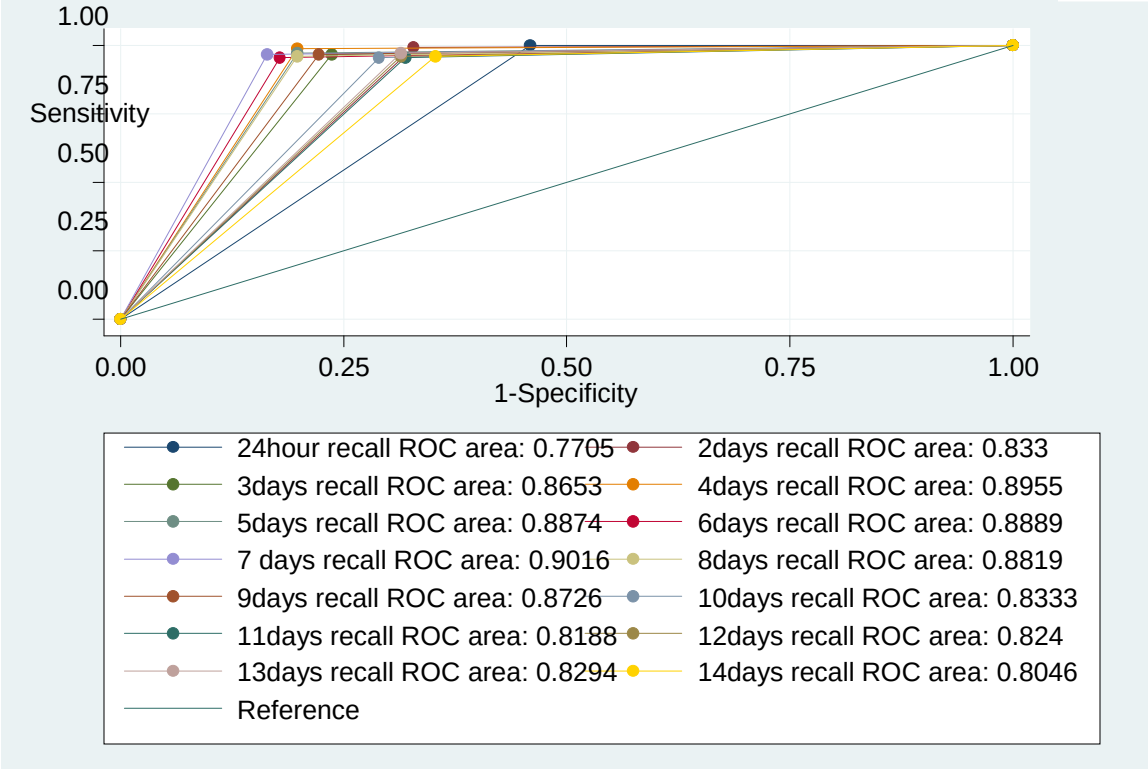

Figure 1: Sensitivity and specificity of short period recalls by using 14 days observation as a reference

Sensitivity and specificity of short period recalls was also conducted across the different age groups (Table 7). The specificity in all age group increased as the number of recall days increased until the 7th day and decreased then. Among the 0-1 age group the specificity increased from 37.5% obtained by 24 hour recall to 77.3% obtained by 6days recall. Similarly in the 2-3 months age group it increased from 39.7% obtained by 24 hour recall to 81% obtained by 7 days recall. The improvement in specificity was also observed among infants in the 4-5month age group.

Table 7: Sensitivity and specificity of the different methods by using 14 days observation as a reference method across different age groups, Butajira HDSS, Ethiopia, 2018

Age group(0-1 month(n=125)					
Recall periods	**Sensitivity%**	**Specificity%**	**PPV%**	**NPV%**	**AUR**
24 hour recall	100[95.8-100]	37.5[22.7-54.2]	77.3[68.3-84.7]	100[78.2-100]	0.688[0.612-0.763
2 days recall	100[95.8-100]	60[43.3-75.1]	84.2[75.6-90.7]	100[85.8-100]	0.8[0.723-0.877]
3 days recall	97.6[91.8-99.7]	72.5[56.1-85.4]	88.3[80-94]	93.5[78.6-99.2]	0.85[0.779-0.923]
4 days recall	98.8[93.6-100]	77.5[61.5-89.2]	90.3[82.4-95.5]	96.9[83.8-99.9]	0.882[0.815-0.948]
5 days recall	98.8[93.6-100]	77.5[61.5-89.2]	90.3[82.4-95.5]	96.9[83.8-99.9]	0.882[0.815-0.948]
6 days recall	98.8[93.6-100]	77.5[61.5-89.3]	90.3[82.4-95.5]	96.9[83.8-99.9]	0.882[0.815-0.948]
7 days recall	98.8[93.6-100]	72.5[56.1-85.4]	88.4[80.2-94.1]	96.7[82.8-99.9]	0.857[0.786-0.928]
8 days recall	97.6[91.8-99.7]	67.5[50.9-81.4]	86.5[78-92.6]	93.1[77.2-99.2]	0.826[0.75-0.901]
9 days recall	96.5[90-99.3]	65[48.3-79.4]	85.4[76.7-91.8]	89.7[72.6-97.8]	0.807[0.73-0.885]
10 days recall	96.5[90-99.3]	55[38.5-70.7]	82[73.1-89]	88[68.8-97.5]	0.757[0.677-0.838]
11 days recall	96.5[90-99.3]	57.5[40.9-73]	82.8[73.9-89.7]	88.5[69.8-97.6]	0.77[0.69-0.85]
12 days recall	95.3[88.4-98.7]	57.5[40.9-73]	82.7[73.7-89.6]	85.2[66.3-95.8]	0.764[0.683-0.845]
13 days recall	85.2[66.3-5.8]	50[33.8-66.2]	81[72.1-88]	100[83.2-100]	0.75[0.672-0.828]
14 days recall	98.8[93.6-100]	52.5[36.1-68.5]	81.6[72.7-88.5]	95.5[77.2-99.9]	0.757[0.677-0.836]
Age group(2-3 month(n=127)					
Recall periods	**sensitivity%**	**Specificity%**	**PPV%**	**NPV%**	**AUR**
24 hr recall	100[94.8-100]	39.7[27-53.4]	66.3[56.4-75.3]	100[85.2-100]	0.698[0.635-0.762]
2 days recall	98.6[92.2-100]	60.3[46.6-73]	74.7[64.5-83.3]	97.2[85.5-99.9]	0.794[0.729-0.86]
3 days recall	98.6[92.2-100]	72.4[59.1-83.3]	81[70.9-88.7]	97.7[87.7-99.9]	0.855[0.795-0.915]
4 days recall	98.6[92.2-100]	75.9[62.8-86.1]	82.9[73-90.3]	97.8[88.2-99.9]	0.872[0.815-0.929]
5 days recall	97.1[89.9-99.6]	74.1[61-84.7]	81.7[71.6-89.4]	95.6[84.9-99.5]	0.856[0.796-0.916]
6 days recall	94.2[85.8-98.4]	77.6[64.7-87.5]	91.8[80.4-97.7]	83.3[73.2- 90.8]	0.859[0.798-0.92]
7 days recall	95.7[87.8-99.1]	81[68.6-90.1]	85.7[75.9-2.6]	94[83.5-98.7]	0.883[0.827-0.94]
8 days recall	95.7[87.8-99.1]	77.6[64.7-87.5	83.5[73.5- 90.9]	93.8[82.8-98.7]	0.866[0.807-0.925]
9 days recall	100[94.8- 100]	70.7[57.3- 81.9]	80.2[70.2- 88]	100[91.4- 100]	0.853[0.794-0.913]
10 days recall	97.1[89.9- 99.6]	69[55.5- 80.5]	78.8[68.6- 86.9]	95.2[83.8-99.4]	0.83[0.767-0.894]
11 days recall	95.7[87.8- 99.1]	62.1[48.4- 74.5]	75[64.6 - 83.6]	92.3[79.1- 98.4]	0.789[0.721-0.856]
12 days recall	97.1[89.9- 99.6]	69[55.5- 80.5]	78.8[68.6-86.9]	95.2[83.8- 99.4]	0.83[0.767-0.894]
13 days recall	95.7[87.8- 99.1]	69[55.5- 80.5]	78.6[68.3-86.8]	93[80.9- 98.5]	0.823[0.758-0.888]
14 days recall	95.7[87.8-99.1]	63.8[50.1-76]	75.9[65.5-84.4]	92.5[79.6-98.4]	0.797[0.73-0.864]

Age group(4-5 month(n=139)					
Recall periods	**Sensitivity%**	**Specificity%**	**PPV%**	**NPV%**	**AUR**
24hr recall	100[88.8-100]	68.5[58.9-77.1]	47.7[35.1-60.5]	100[95.1-100]	0.843[0.799-0.887]
2 days recall	100[88.8- 100]	74.1[64.8- 82]	52.5[39.1-65.7]	100[95.5-100]	0.87[0.829- 0.912]
3 days recall	90.3[74.2- 98]	80.6[71.8-87.5]	57.1[42.2- 71.2]	96.7[90.6-99.3]	0.854[0.79-0.919]
4 days recall	100[88.8- 100]	84.3[76- 90.6]	64.6[49.5-77.8]	100[96-100]	0.921[0.887- 0.956]
5 days recall	93.5[78.6-99.2]	85.2[77.1- 91.3]	64.4[48.8-78.1]	97.9[92.5-99.7]	0.894[0.838 -0.949]
6 days recall	87.1[70.2- 96.4]	86.1[78.1- 92]	64.3[48-78.4]	95.9[89.8-98.9]	0.866[0.798- 0.934]
7 days recall	93.5[78.6-99.2]	88.9[81.4-94.1]	70.7[54.5-83.9]	98[92.8-99.8]	0.91[0.859- 0.965]
8 days recall	90.3[74.2- 98]	86.1[78.1- 92]	65.1[49.1- 79]	96.9[91.1-99.4]	0.882[0.82-0 .944]
9 days recall	90.3[74.2-98]	87[79.2-92.7]	66.7[50.5-80.4]	96.9[91.2- 99.4]	0.887[0 .825-0.949]
10 days recall	90.3[74.2-98]	78.7[69.8-86]	54.9[40.3-68.9]	96.6[90.4-99.3]	0.845[0.78-0.911]
11 days recall	90.3[74.2-98]	75[65.7-82.8]	50.9[37.1-64.6]	96.4[89.9-99.3]	0.827[0.76-0.89]
12 days recall	96.8[83.3- 99.9]	73.1[63.8-81.2]	50.8[37.5- 64.1]	98.8[93.2-100]	0.85[0.797-0.902]
13 days recall	90.3[74.2- 98]	75[65.7-82.8]	50.9[37.1- 64.6]	96.4[89.9- 99.3]	0.827[0.76-0.894]
14 days recall	87.1[70.2- 96.4]	78.7[69.8- 86]	54[39.3-68.2]	95.5[88.9-98.8]	0.829[0.758-0.9]

Specificity sensitivity and PPVof the data obtained from seven day recall was done across different variables. The specificity of 7 days recall was higher among the age group of 4-5month (88.9%) and was lower among 0-1month infants (72.5%). Higher specificity was observed when we compare mothers who attended school with those who did not (86.4% vs 78.4%). The variability was also observed among housewife and working mothers with specificity of 90% and 81.9% respectively.

Table 8: Sensitivity and specificity of 7 days recall by 14 multiple 24 hours recall as a reference method across different variables, ButajiraHDSS, Ethiopia, 2018 (n=391)

Variables	Sensitivity%	Specificity%	PPV%	NPV%	AUR
Infant's age					
0-1month	98.8[93.6-100]	72.5[56.1-85.4]	88.5[80.2-94.1]	96.7[82.8-99.9]	0.875[0.79-0.93]
2-3month	95.7[87.8-99.1]	81[68.6-90.1]	85.7[75.9-92.6]	94[83.5-98.7]	0.88[0.83-0.94]
4-5month	93.5[78.6-99.2]	88.9[81.4-94.1]	70.7[54.5-83.9]	98[92.8-99.8]	0.912[0.86-0.97]
School attendance					
Yes	96.5[91.3-99]	86.4[79.3-91.7]	86[78.8-91.5]	96.6[91.5-99.1]	0.914[0.88-0.95]
No	97.1[90.1-99.7]	78.4[67.3-87.1]	81[70.9-88.7]	96.7[88.5-99.6]	0.878[0.83-0.93]
Occupation status					
Working	98[94.2-99.6]	81.9[75.2-87.5]	83[76.6-88.2]	97.8[93.8-99.6]	0.9[0.868-0.931]
Housewives	91.7[77.5-98.2]	90[76.3-97.2]	89.2[74.6-97]	92.3[79.1-98.4]	0.908[0.84-0.97]
Socioeconomic status					
Poorest	95.6[84.9-99.5]	84.8[68.1-94.9]	89.6[77.3-96.5]	93.3[77.9-99.2]	0.902[0.83-0.971]
Poorer	100[91-100]	90[76.3-97.2]	90.7[77.9-97.4]	100[90.3-100]	0.95[0.903-0.997]
Middle	97.2[85.5-99.9]	76.7[61.4-88.2]	77.8[62.9-88.8]	97.1[84.7-99.9]	0.87[0.8-0.939]
Rich	93.9[79.8-99.3]	79.5[64.7-90.2]	77.5[61.5-89.2]	94.6[81.8-99.3]	0.87[0.794-0.94]
Richest	96.9[83.8- 99.9]	87[73.7-95.1]	83.8[68-93.8]	97.6[87.1-99.9]	0.919 [0.86-.977]

The performance of 14 days recall varied across different variables. Using 14 multiple days recall as a reference method higher specificity was observed among the age group of 4-5 months of age (75.9%). The specificity of mothers who attended school was higher when compared to those who do not attend school (69.2% vs 56.8%). Similarly variabily was observed among those mothers who were working and house wives.The specificity of working mothers was slightly lower than that of house wives.

Table 9: Sensitivity and specificity of 14 days recall by 14 multiple 24 hours recall as a reference method across different variables, ButajiraHDSS, Ethiopia, 2018 (n=391)

Variables	Sensitivity	Specificity	PPV	NPV	AUR
Infant's age					
0-1month	98.8[93.6-100]	42.5[27-59.1]	78.5[69.5-85.9]	94.4[72.7-99.9]	0.71[0.63-0.79]
2-3month	97.1[89.9-99.6]	59.3[45.7-71.9]	73.3[63-82.1]	94.6[81.8-99.3]	0.78[0.72-0.85]
4-5month	87.1[70.2-96.4]	75.9[66.7-83.6]	50.9[36.8-64.9]	95.3[88.5-98.7]	0.815[0.74-0.887
School attendance					
Yes	94.7[88.9-98]	69.2[60.6-76.9]	72.5[64.6-79.5]	93.9[87.1-97.1]	0.82[0.78-0.86]
No	98.6[92.3-100]	56.8[44.7-68.2]	68.3[58.3-77.2]	97.7[87.7-99.9]	0.78[0.72-0.83]
Occupation status					
Working	100[90-100]	64.5[49.4-79.9]	71.4[56.7-83.4]	100[87.2-100]	0.83[0.76-0.9031]
Housewives	95.3[90.6-98.2]	65.9[56.7-71.7]	70.6[63.8-76.8]	93.9[87.7-97.5]	0.79[0.76-0.84]

6. Discussion

This study was undertaken with the aim of assessing an alternative indicator that could accurately measure exclusive breastfeeding practice. In order to come up with an alterantive method we compared short period recall methods by taking 14 multiple 24 hour recall as the best comparsion method. A considerable disagreement was observed between these methods used.The highst prevalence of exclusive breastfeeding was found when single 24 hour hour recall was used (71.1%). This prevalence lowers to 47.1% when 24 hour recall was repeated for 14 days making the overestimation from single 24 hour recall 24.1%.Usingshort period recall methods, the lowest prevalence of EBF observed from 7 days recall (54.24%). Comparing with 14 multiple 24 hour recalls the overestimation of short period recalls ranges from 6.9% - 24.1%. Seven days recall was found to have the lowest overestimation (6.9%). The lowest specificity of 54.4% and PPV of 66.3% was found from single 24 hr recall where asthet highest specificity of 83.5% and PPV 84% was found from 7 days recall.

A disagreement on the prevalence of EBF was observed among the different methods of recall used. The prevalence of EBF decrease as we go from two days recall to seven days recall which ranges 64.2-54.24%, then starts to increase as we go from 8 days recall to 14 days recallranging 55.8-63.94%. Similarly the pattern of overestimation obtained from these short periods recalls derecrease as we go from two days recall to seven days recall (16.64-6.93%) and inreasese as we go from 8 days recall to 14 days recall.

The decreasing pattern in EBF estimationfrom short period recalls might be due to the day to day variation in infants feeding practice.This can be explained by the probability of the mother giving the child food/fluid items in addition to breast milk as the days varied.The possibility of giving these additional fluid/foods might be different with respect to the day's nature. For example in previous study which was also acknowledged in ours there is a culture of giving an infant a plant called 'anita kitel' instudy area believing it would help the infant to gain weight. This plant is given twice a week on Wednesdays and Saturdayswhich aremarket days of the area. These types of cultures and changes in infant feeding that have an impact on the prevalencecould not be addressed using a single day measurement unless we step up the assessment period.A study done comparing multiple 24 hour recalls with 7 observation days has also found similar findings on the pattern of discrepancystating the possibility of capturing the day to day variation

increased as the observation of days increase (12). Another study done comparing EBF rate obtained by single 24 hour recall with short recalls obtained at 2, 4 and 6 months concluded that using point in time data to assess EBF rate is subjected to error. It was stated the disagreement between the methods is mainly due to the day to day variation in feeding patterns that could be captured by the short recalls(40) since infant feeding practices vary widely within short periods of time(5).

The other thing we found was when the recall period extends beyond seven day (a recall within the period of 8-14 days) the rate of exclusive breastfeeding starts to rise again.Eventhough we would expect high agreement between the two methods as the tests were dependentthe two methods describe the reality in different ways. This might be due to inability of the mothers to remember the exact additional fluid/foods given to the infant as the number of days to recall increase.Recall methods may result in misclassification if respondents' recall ability is poor(27).The length of the recall period may also affect the estimated prevalence of feeding practices since mothers may not recall accurately the true fluidity of these practices during early infancy and the rapid changes occurring when mothers move in and out of certain practices(5). Explaning disagreement between two methods used to estimate the duration of EBF one study stated that the problem might be due to the probability of interefering with both the memory and maybe also with the natural practices by making mothers more conscious about what they are giving by conducting a study(41).

The main threat to the validity of recall methods is recall bias(5).Research outcomes concerning the accuracy of maternal recall of breastfeeding practices are not uniform. A research done comparing data obtained prospectively throughout the first 6 months of life with recall method has found maternal recall inaccurate. According to the prospective study it is only 2 mothers who has breast fed their child exclusively for 6 month indicating inaccuracy of data obtained from maternal recall could be a source of error in the actual rate of EBF(34). Although using short period recalls of 8-14 days there could be difficulty of remembering all the food/fluid items given for the infant as the period to recall increases.

On the other handother findings have found the maternal recall of breastfeeding initiation and duration valid and reliable, especially when the recall period is short (< 3 years) (35). Similarly, another study has concluded data collected on infant feeding practices by maternal recall is accurate for events that took place less than 18 months previously. The other possible

explanation is since there is a general knowledge of exclusive breast feeding practice considered as a good practice it may lead to overreporting of the positive practice (EBF). Though the probability of recall bias is high as the the recall period increase there is high chance of making a room for indicator to pick any movement in the infant feeding pattern by collecting data over a period of duration(). This is because an infant can be exclusively breastfed for a period of time andreceive mixed foods in some other time.

When prevalence of EBF using 14 multiple days recall was compared with 24 hour recall prevalence, differences were noted at the various age groups of the infant, with the latter prevalence being higher at all ages of the infant. This discrepancy between the reference method and the 24 hour recall among the age groups ranges from 20-27.5%.Seven days recall has presented prevalenceof EBF differently among the age groups. By comparing with the reference method the overestimation among the age groups ranged 6.29-7.2%.

Sensitivity and specificity of short period recalls was also evaluated. Comparing with 24 hours recall short period recalls relatively showed better picture of exclusive breast feeding practice. But even between these short periods recall methods there was a significant difference in the performance of estimating the practice. By using 14 repeated 24 hour recalls as a reference the sensitivity of short period recalls ranges 95.1-100%. The lowest specificity (54.4%) and positive predictive value (66.3%) was observed from a single 24 hour recall implying the 24 hour recall method doesn't sufficiently exclude those who were not exclusively breast feeding.

A significant difference was found when the 2 days recall was compared to the reference method. A disagreement between the two methods reaches as high as 16.87% with specificity of 67.5 % and positive predictive value of 73.3%. This showsyet mothers who had exclusively breast fed over the previous 2 days had not necessarly breast fed consistently in the rest of time. Several previous studies have also showed disagreement between different methods of recall.A study done in South Africa comparing 48 hour recall with data collected longitudinally using three 48 hour interviews in a week as a reference has similarly found low specificity (65–89%) and positive predictive value (31–48%) of 48 hours recallconcluding reported breast feeding practices over the previous 48 hours could not reflect EBF practices(32). Even though 2days recall showed better estimate than 24 hour recall it still doesn't capture the true movment in feeding pattern.

The ability of the short period recall methods in representing the feeding pattern improved up to the seventh day. Seven days (week) recall have showed a significant improvement on specificity (83.5%) and positive predictive value of (84%) indicating it had a better ability representing the two weeks feeding pattern.A study done to validate methods of collecting data on the duration of exclusive breastfeeding has found similar results on the accuracy of seven days recall. Comparing with thrice weekly recall over the same period of time the study has found Seven day recall accurately reflected EBF practices with 96%sensitivity and 94%specificity(32).

Specificity of 7 days recall was done across different variables. The specificity of 7 days recall was higher among the age group of 4-5month (88.9%) and was lower among 0-1month infants (72.5%). This might be due to the fact that as the ages of the infant increase the probability of giving additional foods increase which could be identified in a better way by seven days recall since it includes everyday of the week. Poor specificity of EBF was observed among women who worked outside the home (81.9%). This might be due to mothers who stayed at home tends to breast fed exclusively whereas those who do not stayed home and working out side may add some drinks/foods since they could not be available the whole time and exclusively breastfed.

The overestimation of EBF persistently increased when we asked a mother to recall a feeding practice beyond a week. On the other hand the specificity and PPV also drops as the recall period extends 8-14 days ranging (80.1-65%) and (81.2-71.2%) respectively. The presence of more cases of EBF in the longer days of recall greater than 7^{th} day potentially indicates the presence of more false positive cases of EBF that the positive predictive value drops as the recall duration increases. This shows even though the prevalence of EBF reported using longer duration is high the mothers had not necessarly exclusively breastfed over these recall period.

Of the short recalls 14 days(two weeks) recall had a specificity of 65% and positive predictive value of 71.22%.

The day to day variation of feeding practice could not be captured by a single day assessment rather by following for a period of time. It is intelligible that prospective studies are likely to be more accurate since it helps us to see phenomenon of infants moving in and out of feeding categories(10).Mothers may exlusively breast fed their child at some time points and add some drink/food items at other times. From the consecutive days data we have found the prevalence of EBF decreases as the number of days of observation increase. This shows that the practice is not

consistent since those mothers who were reported being EBF at the beginning give other foods in addition to breast milk in the following days. This could help us to see the real picture of infants feeding history inorder to categorize EBF status accordingly. But this could be costly and time consuming indicating the need for other feasible alternative indicator/methodwith higher specificity. So having short period recall might fill this gap. By havinga number of days to recall we could distinguish those who are really EBF and who are not. This would help to avoid the misclassification from single 24 hour recall which is very dangerous because the potential to further improve EBF rate will not be addressed by overlooking opportunities to advance child health. But these recall periods should be short since there is risk of recall bias. As indicated by the result the specificity and positive predictive value of the short period recalls increases as the recall periodincreases up to the seventh day.By asking the mothers to recall what they have given in the past week we have found a better picture of the feeding history. A week recall gave us information that is closer to the true value.This could provide us a better picture on the usuall infants feeding practice by identifying the day to day variation since it involves all the days of the week.

Based on these findings infant feeding patterns vary on a daily basis and using a single day assessment to describe them may be misleading, with important consequences. Infant feeding patterns are complex as an infant can be exclusively breastfed for a period, receive other food due to a change in circumstances, and then return to exclusive breastfeeding again. This complexity can be captured by continuous assessment which is not a feasible in certain circumstance especially in resource limited setting. From our finding by taking improved specificity and feasibility into consideration the use of seven days (week) recall could be an alternative method to assess EBF practice.

7. Strength andLimitation

The strength of this study is taking repeated measure for consecutive days and itemized check list to aid the short period recalls method and minimize recall bias.

The major limitation of this study was social desirability bias that might be introduced due to conducting 24 hour recall and the short period recalls for fourteen consecutive days. Though we couldn't avoid it all different attempts were made to minimize this desirability bias. Theseincludes clearly explaining the objective of the study and rotating data collectors each day inorder to distruct the study participants.

8. Conclusion and Recommendation

The current study evaluated different methods in estimating exclusive breast feeding. Different methods used resulted in significant difference in EBF prevalence. Seven day (week) recall resulted in the lowest overestimation of EBF prevalence while single 24 hour recall resulted in the highest compared to reference method. It was affirmed the current EBF status based on 24 hour EBF recall overestimate the practice and does not accurately represent the usualfeeding pattern. Week recall had high specificity and presented a prevalence that is close to reference method.

Inconclusion though researchs suggest feeding data should be collected prospectively in order to gather a lifetime feeding history, by taking the improved specificity and feasibility into consideration the use of week recall could be an alternative method to assess exclusive breastfeeding practice. Week recall could capture the day to day variationsince it includes all days of the week which provides us better understanding andinformationof newborn feeding practices that is close to the real practice.We recommend WHO to consider the use of week recall over 24 hour recall in assessing exclusive breastfeeding.

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Annexes

Annex 1: Subject information sheet

Addis Ababa University

School of public health

Information sheet

Hello, My name is ……I am here to have an interview with you on behalf of Sewitemariam Desalegn. She is a student of Addis Ababa University School of public health conducting a research on the accuracy of week recall in estimating exclusive breast feeding prevalence for partial fulfillment of masters of public health. She received permission from Addis Ababa university school of public health to conduct this study.

You are selected randomly to participate in this study because you are a mother with a child age less than 6 months. Your participation in this study is voluntary. If you agree to participate in the study, you will be followed for 14 consecutive days and asked to answer some questions about yourself, your delivery experience and your breastfeeding practice. The interview with you will take about 20 minutes. It is your right to be willing to participate in the study or not. If you are willing, you have the right to stop at any time or withdraw without giving any reason which you will not be subjected to any ill-treatment.

The study will help you to give the appropriate nutritional care for your child and exercise the recommended breastfeeding practice. It also helps policy makers, and researchers to give appropriate attention on issues of exclusive breastfeeding indicators and provide alternative methods of assessment. The information that you provide will be kept confidential by using only code numbers and locking the data. Only the members of the study team will have the access to the non coded data and the data will not be used for purposes other than the study. Your willingness and active participation is very important for the success of this study.

If you need any further information or explanation regarding to the study, you can have this address to contact.

Name – Sewitemariam DessalegnTel no – 0912121097 E-mail – sewitdesa@gmail.com

Do you have any questions?

Based on the information provided are you willing to participate in the study?

Yes____ No_____

If Yes- read the consent form to the participant, sign it and continue the interview.

If No- Thank and skip to the next participant.

Annex 2: Informed consent

Informed consent Certified by:

Respondent's signature ----------Date----------

Interviewer: Name---------- Signature----------

Questionnaire number----------

Date of interview----------Time started----------Time completed----------

Result of interview:

1. Completed ☐
2. Respondent not available ☐
3. Refused ☐
4. Partially completed ☐

Checked by: Supervisor: Name _____ Signature_____

Annex 3: Questionnaire

Part 1: Identification

No/code _____district_____ kebele name_____

Name of the respondent _____relation of respondent with the child _____

Name of the interviewer _____Date of the interview _____

Time started_____ Time finished _____

Part 2: infant charaterstics

No	Question	Alternative/response	Skip
201	Name of the child		
202	Sex of the child	Male……..1 Female……..2	
203	Date of birth of the child (day, month, year)	___/__/____	
204	Age of the child in months		

Part3: Maternal and household socioeconomic and demographic characteristics

No	Question	Alternative/response	Skip
301	In what month and year were you born	Month…… Don't know month ..... 99 Year..... Don't know year..... 99	
302	How old are you now? compare and correct and /or if inconsistent	……..years	
303	What is your marital status	Not married/Single……...1 Married……..2 separated……....3 Divorced……....4	

		Widowed……5	
304	What is your Religion	Orthodox…….1 Muslim……2 Protestant……3 Catholic……....4 Other(specify)……..99	
305	To which ethnic group do you belong?	Oromo .....1 Amhrara .....2 Gurage .....3 Tigray .....4 Afra .....5 Silete.....6 Other (specify) 99	
306	Have you attend any school?	Yes……..1 No……2	If no skip to question no.307
307	What is the highest level of education you attend?	Primary (1-8 grade) ……1 Secondary (9-10) ……2 Technical/vocational……3 Higher(specify)_____.....4	
308	What is your occupation?	Government employee……1 Private employee…….2 Merchant…….3 Daily laborer……4 Farmer…….5 House wife……..6 Student ……...7 Unemployee ……..8 Maid/ servant ……9 Other(specify)……..99	
309	What is the main source of	Piped inside dwelling 1	

	drinking water for member of your house holds?	Piped to yard/plot .....2 Public tap.....3 Protected well/spring .....4 Unprotected well/spring.....5 Protected well .....6 Unprotected well .....7 Pond/lake/River/stream/spring/Dam..8 Rain water .....9 Tanker truck .....10 Bottled water.....12 No fixed facility .....96 Other(specify)……..99	
310	How long it takes to fetch water and comeback?	Time:_____	
311	What kind of toilet facility do you use?	Flush to septic tank .....1 Flush to Pit latrine …….....2 Flush to piped sewere system……3 Flush to somewhere else……4 Traditional pit toilet.....5 Pit latrine with slab .....6 Pit latrine without slab .....7 Ventilated improved pit latrine .....8 Composting toilet…….9 No facility/bush/field……..……..10 Other (specify) _____....99	
312	Does your household have	Electricity .....1 Watch/clock.....2 Radio .....3 Television.....4 Mobile Telephone 5	

		House Phone .....6 Refrigerator .....7 Table..……...8 Chair.....9 A bed with cotton/Sponge/Spring mattress .....10 Electric Mitad.....11 Kerosene Lamp/pressure .....12 Solar .....13 Flash light that works with battery..14	
313	What type of fuel do you mainly use for cooking?	Electricity .....1 LPG/natural gas.....2 Biogas.....3 Kerosene.....4 wood.....5 Charcoal .....6 Straw/shrubs/grass .....7 Animal Dung.....8 Agricultural crop .....9 Other (specify)……..99	
314	Does any member of this house hold own	Bicycle.....1 Motorcycle/scooter/Bajaj .....2 Animal drawn cart.....3 Car/Truck 4	
315	Does this household own any livestock, herds, other farm animals, or poultry?	Yes……1 No……..2	If no skip to question # 317
316	How many of the following animals do this household own?	Milk cow or bulls / / Livestock/other cattle / /	

		Horse, donkey, mules / / Sheep / / Goats / / Chicken / / Beehives / /	
317	Does any member of this household own any crop land?	Yes……1 No……..2	If no skip to question # 319
318	How many (local units) of agricultural land do members of this household own?	Local units_____	
319	Main material of the roof	Thatch/leaf/mud .....1 Plastic .....2 Bamboo .....3 Wood planks .....4 Corrugated iron/metal .....5 Wood .....6 Cement/concrete .....7 Other (specify) 99	
320	Main material of the floor	Earth/Sand……..1 Dung……...2 Wood/planks……...3 palm/bamboo……..4 Polished wood or parquet……...5 Vinyl or asphalt strips…….6 Ceramic tiles……...7 Cement……....8 carpet……..9 Other(specify) ……..99	
321	Main material of the wall	No walls 1	

		Cane/Trunks/Bamboo/Reed .....2 Dirt .....3 Wood with Mud .....4 Stone with mud .....5 Card board .....6 Stone with lime/cement .....7 Bricks .....8 Wood planks/shingles .....9 Other(specify) …….99	

Part 4: Exclusive breast feeding practice by using 24 hour recall

No	Question	Categories	Special instruction		
401	Are you currently breastfeeding (name)?	Yes……..1 No……2 Don't know……..98	If No skip to question # 403		
402	Was (name) breastfedyesterday during the day orat night?	Yes……..1 No……2 Don't know……..98	If No skip to question # 404		
403	Sometimes babies are fedbreast milk in different ways. Did (name) consume breastmilk by a cup, spoon, or bottle, or has been breastfedby another women yesterday during the day or at night?	Yes……..1 No……2 Don't know……..98			
404	Was (NAME) given any vitamin drops or other medicines as drops yesterdayduring the day or at night?	Yes……..1 No……2 Don't know……..98			
405	Was (NAME) given ORS yesterday during the day or at night?	Yes……..1 No……2 Don't know……..98			
406	I would like to ask you about liquids that [NAME] may have had yesterday during the day and at night. Yesterday, during the day or at night, did [NAME] receive any of the following?		Yes	No	Don't know
A	Plain water		1	2	98
B	Infant formula		1	2	98
C	Animal milk		1	2	98
D	Juice or juice drinks		1	2	98
E	Yogurt		1	2	98
F	Thin porridge		1	2	98
G	Tea or coffee with milk		1	2	98
H	Any other water-based liquids		1	2	98
407	Yesterday, during the day or at night, did [NAME] eat any of the		Yes	No	Don't

	following foods?			know
A	Porridge, bread, rice, noodles or other foods made from grains	1	2	98
B	Any commercially fortified baby food	1	2	98
C	Any food made from teff, like injera, kita	1		98
D	Pumpkin, carrots, squash or sweet potatoes yellow or orangeinside	1	2	98
E	White potatoes, cassava, bulla or any other foods made from roots	1	2	98
F	Any dark green leafy vegetables	1	2	98
G	Ripe mangoes, ripe papayas	1	2	98
H	Any other fruits or vegetables	1	2	98
I	Liver, kidney, heart or other organ meats	1	2	98
J	Any meat, such as beef, pork, lamb, goat, chicken	1	2	98
K	Eggs	1	2	98
L	Any fresh or dried fish or shellfish?	1	2	98

Part 6.Exclusive breast feeding practice using short period recalls

Instraction: write the number of days to recall on the space provided

Now I an going to ask you your infant feeding practice in the previous _____days

Days to recall _____

No	Question	Categories	Special instruction
501	Are you currently breastfeeding (name)?	Yes……1 No……..2 Don't know……98	If No skip to question # 503
502	Was (NAME) breastfed the previous _____during the day or at night?	Yes……1 No……..2 Don't know……98	If No skip to question # 504
503	Was (NAME) given any vitamin drops or other medicines as drops during the previous _____at day or night?	Yes……1 No……..2 Don't know……98	
504	Did (name) consume breast milk by a cup, spoon, or bottle, or has been breastfed by another women during the previous _____at day or at night?	Yes……1 No……..2 Don't know……98	
505	Was (NAME) given ORS the previous _____during the day or at night?	Yes……1 No……..2 Don't know……98	

506	Did [NAME] receive any of the following liquids in the previous _____during the day or at night?	Yes	No	Don't know
A	Plain water	1	2	98
B	Infant formula	1	2	98
C	Animal milk	1	2	98
D	Juice or juice drinks	1	2	98
E	Yogurt	1	2	98
F	Thin porridge	1	2	98

G	Tea or coffee with milk	1	2	98
H	Any other water-based liquids	1	2	98
507	Did [NAME] eat any of the following foods liquids in the previous _____during the day or at night?	Yes	No	Don't know
A	Porridge, bread, rice, noodles or other foods made from grains	1	2	98
B	Any commercially fortified baby food	1	2	98
C	Any food made from teff, like injera, kita.	1	2	98
D	Pumpkin, carrots, squash or sweet potatoes that are yellow or orange inside	1	2	98
E	White potatoes, cassava, bulla or any other foods made from roots	1	2	98
F	Any dark green leafy vegetables	1	2	98
G	Ripe mangoes, ripe papayas	1	2	98
H	Any other fruits or vegetables	1	2	98
I	Liver, kidney, heart or other organ meats	1	2	98
J	Any meat, such as beef, pork, lamb, goat, chicken	1	2	98
K	Eggs	1	2	98
L	Any fresh or dried fish or shellfish	1	2	98

Annex 4: Amharic version of information sheet

አዲስአበባዩኒቨርስቲ

ህብረተሰብጤናሳይንስኮሌጅ

የመጠየቂያ/መረጃቅፅ /

ጤና ይስጥልኝ፤ ስሜ_____ይባላል፡፡ የመጣሁት በአዲስ አበባ ዩኒቨርስቲ ህብረተሰብ ጤና ሳይንስ ተማሪ የሆነችውን ሰዊተማርያም ደሳለኝን ወክዬ ነው፡፡ የሁለተኛ ድግሪ መመረቂያ ጥናቷን የምትሰራው የእናት ጡት ማጥባት ልምድን መሰረት ያደረገ እና ልምዱን ለማጥናት የተዘጋጁት አመልካቾቹስ ማሻሻያ ቢደረግላቸው ምን ያህል ትክክለኛ መረጃ ይሰጣሉ የሚለውን በተመለከተ ነው፡፡ ጥናቱን ለማድረግ ከአዲስ አበባ ዩኒቨርሲቲና ጤና ቢሮ ፈቃድ አግኝታለች፡፡

እርስዎ የተመረጡት በዚህ አካባቢ ነዋሪና እድሜው ከስድስት ወር በታች የሆነ ህፃን ልጅ እናት ስለሆኑ ነው፡፡በጥናቱ ላይ መሳተፍ ሙሉ በሙሉ በርስዎ ፈቃድ ላይ የተመሰረተ ሲሆን ለመሳተፍ ከተስማሙ ጥናቱ ለተከታታይ አስራ አራት (14) ቀናት የሚካሄድ ይሆናል፡፡ መጠይቁ የተለያዩ ክፍሎችን ያካተተ ሲሆን ስለራስዎ፤የልጅዎ አወላለድ አንዲሁም የጡት ማጥባት ልምድዎ እንጠይቆታለን፡፡ ቃለ መጠይቁ ወደ 20 ደቂቃ የሚፈጅ ይሆናል፡፡ በጥናቱ የመሳተፍ ወይም አለመሳተፍ ሙሉ መብት አለዎት አንዲሁም ለመሳተፍ ፈቃደኛ ከሆኑ በኃላ በፈለጉት ጊዜ ማቋረጥ ወይም ማቆም ይችላሉ ፡፡ ይህም በጥናቱ አለመሳተፍ የሚደርስቦ ጉዳት የለም፡፡ከዚህ ጥናት የተሰበሰበው መረጃ ሙሉ ሚስጥራዊነቱ የተጠበቀ ይደረጋል፡፡ ከጥናት ቡድኑ ውጪ ማንም የተሰበሰበውን መረጃ ማግኘት አይችልም፡፡እንዲሁም መረጃው ከጥናቱ አላማ ውጪ ለምንም አንጠቀምበትም፡፡

በጥናቱ በመሳተፍዎ ለልጅዎ የተሟላ ጤንነት አጅጉን አስፈላጊና ጠቃሚ ስለሆነው ተገቢ የአመጋገብ ስረአቶች ልምድ ይማራሉ፡፡ በተጨማሪም ጥናቱ ለጡት ማትባት ልምድ ተገቢ የሆነው ትኩረት እንዲሰጠውና ጡት ማጥባት ልምድ አመለካቾች በተሻለ አመልካቾች ለመለወጥ ጥረት አንዲያደርጉ ለሚመለከታቸው አካላት በር ይከፍታል፡፡የእርስዎ ፈቃደኝነትና የነቃ ተሳትፎ ለዚህ ጥናት ስኬታማነት አስፈላጊ ነው፡፡

ስለ ጥናቱ ጥያቄ ወይም ተጨማሪ መረጃ ከፈለጉ በዚህ አደራሻ መጠየቅ ይችላሉ፡፡

ስም፡- ሰዊተማርያም ደሳለኝ

ስልክቁጥር፡-0912121097 ኢሜል፡-sewitdesa@gmail.com

የስምምነት መጠየቂያ/ማረጋገጫ ቅፅ

ከላይ በተሰጡት መረጃ መሰረት በዚህ ጥናት ለመሳተፍ ፈቃደኛ ኖት

1 አዎ(ቃለመጠይቁ ይቀጥል)

2 አይደለሁም (አመስግነህ ወደ ሚቀጥለው ተሳታፊ እለፍ)

የተሳታፊው ፊርማ_____ቀን_____

ቃለመጠይቅ አድራጊው ስም_____ፊርማ_____

ቁጥር_____

የቃለመጠይቅ የተካሄደበት ቀን_____የተጀመረበት ሰዓት_____ያለቀበት ሰዓት_____

መጠይቁታይቷል/ ተፈትሾል_____

የቃለመጠይቁውጤት፡ 1.ሙሉበሙሉ የተሟላ

2. ያልተገኙ

3. ፍቃደኛ ያልሆኑ

4. በከፊል የተሟላ

በተቆጣጣሪዎች ተረጋግጧል ፤ስም_____ፊርማ_____

ክፍልአንድ፡መለያ

ቁጥር_____ **ቀጠና**_____**ቀበሌ**_____**የመጠይቁቀን**_____

የተሳታፊው/ የመላሹስም_____**ተሳታፊውከህጻኑጋርያላቸውግንኙነት**_____

የጠያቂውስም_____**የተጀመረበትሰአት**_____**ያለቀበትሰአት**_____

ክፍልሁለት - የሕጻኑመረጃ

ቁጥር	ጥያቄ	አማራጭ	ይዘለል
201	የህጻኑ ስም		
202	ጸታ	ወንድ.....1 ሴት.....2	
203	ህጻኑ የተወለደበት (ቀን/ወር/ ዓ.ም)	___/___/_____	
204	የህጻኑ እድሜ በወራት		

ክፍል3፡ አጠቃላይ የእናትና የኑሮ ሁኔታ

ቁጥር	ጥያቄ	አማራጭ	ይዘለል
301	መቼ ነው የተወለድሽው (ቀን/ወር/ዓ.ም)	ወር..... አላውቀውም.....98 ዓ.ም..... አላውቀውም.....98	
302	እድሜሽ ስንት ነው (በአመት)		
303	የጋብቻ ሁኔታ	ያላገባች .....1 ያገባች.....2 የተለያየች.....3 የተፋታች.....4 የሞተባት.....5	
304	ሀይማኖት	ኦርቶዶክስ.....1 ሙስሊም.....2 ፕሮቴስታንት.....3 ካቶሊክ.....4 ሌላ(ይጠቀስ).....99	
305	ብሄሮት ምንድኖ?	ኦሮሞ..... 1 አማራ ..... 2 ጉራጌ 3	

		ትግራ .....4 አፋር .....5 ስልጤ .....6 ሌላ ካለ ይጠቀስ.....99	
306	ትምህርት ተምረሽ ታውቂያለሽ	አዎ.....1 አይ.....2	
307	የትምህርት ደረጃሽ ከሚከተሉት የቱ ነው	የመጀመሪያ ደረጃ.....1 ሁለተኛ ደረጃ.....2 ሠርተፍኬት.....3 ከፍትኛ ደረጃ.....4	
308	የስራ ዘርፍ ምንድን ነው	የ መ ን ግ ስ ት ሰ ራ ተ ኛ .....1 የግል.....2 ነጋዴ.....3 የቀን ሰራተኛ.....4 ገበሬ.....5 የቤት እመቤት.....6 ተማሪ.....7 ስራ የሌላት.....8 የቤት ሰራተኛ.....9 ሌላ.....99	
309	ውሃ ከየት ነው ምትቀዱት	የቤት ዉስጥ ቧንቧ .....1 የግቢ ዉስጥ ቧንቧ.....2 የሰፈር ዉስጥ ቧንቧ/ቦኖ.....3 የተከለለ የጉድጓድ ዉሃ .....4 ያልተከለለ የጉድጓድ ዉሃ .....5 የተከለለ የምንጭ ዉሃ.....6 ያልተከለለ የምንጭ ዉሃ.....7 የወራጅ ወነዝ/ኩሬ/ሀይቅ.....8 የዝናብ ውሃ.....9 የቦቴ/ታንከር ዉሃ.....10 የታሸገ ውሃ.....11 ሌላ ካለ ይገለጽ.....99	
310	ውሃ ለመቅዳት ምን ያህል ጊዜ ይፈጅብሻል	ሰዓት_____	
311	የምትጠቀሙት የመጸዳጃ አይነት	የሚሰራ በውሃ የሚወረድ መጸዳጃ ቤት.....1	

		የማይሰራ በውሃ የሚወርድ መጸዳጃ ቤት…….....2 የሚሰራ የጉድጓድ መጸዳጃ……...3 የማይሰራ የጉድጓድ መጸዳጃ ቤት ……..…..4 ሜዳ ላይ……...5 ሌላ ካለ ይጠቀስ	
312	ለማብሰያ የምትጠቀሙት የትኛውን ነው	ኤሌክትሪክ……..1 የተፈጥሮ ጋዝ……2 ባዮ ጋዝ……..3 ነጭ ጋዝ…….4 እንጨት…….....5 ከሰል…….....6 ሳር/ቅጠል/አገዳ…….....7 ኩበት…….....8 የግብርና እፅዋት…….....9 የጸሀይ ብርሃን…….....10 ሌላ ካለ ይጠቀስ_____.....99	
313	ከሚከተሉት ውስጥ በቤት ውስጥ የሚገኘው የትኛው ነው	ኤሌክትሪክ……1 ሰአት(የግድግዳ)……2 ራዲዮ……3 ቴሌቪዥን……4 ሞባይል……5 የቤት ስልክ……..6 ማቀስቀዣ/ፍሪጅ……..7 ጠረጴዛ……8 ወንበር……9 የእስፖንጅ/ጥጥ ፍራሽ ያለዉ አልጋ…….10 የኤሌክትሪክ ምጣድ……..11 የጋዝ መብራት……..12 በፀሃይ ሀይል የምሰራ መብራት/ሶላር……13 በባትሪ የሚሰራ መብራት……14	
314	ከሚከተሉት ውስጥ በቤት ውስጥ የሚገኘው የትኛው ነው	ሳይክል……..1 ሞቶርሳይክል/ባጃጅ……...2 ጋሪ……3 መኪና……4	

315	በቤት ውስጥ ከብቶች አላችሁ	አዎ.....1 የለም.....2	የለም ከሆነ ወደ ጥያቄ ቁጥር 317 ይሂዱ
316	ከሚከተሉት ውስጥ ቤተሰቡ ስንት የቤት እንስሳት አሉት?	በቁጥር	
	- ላም		
	- በሬ/ከብት		
	- ፈረስ/አህያ/በቅሎ		
	- በግ		
	- ፍየል		
	- ዶሮ		
	- የንብ ቀፎ		
317	የእርሻ መሬት አላችሁ	አለን.....1 የለንም.....2	የለንም ከሆነ ወደ ጥያቄ ቁጥር 219 ይሂዱ
318	ምን ያህል/መደብ መሬት ነው ያላችሁ		
319	የቤቱ ጣሪያ የተሰራው ከምንድን ነው	የሳር ክዳን.....1 ፕላስቲክ.....2 ሸንበቆ.....3 ጣውላ.....4 ቆርቆሮ.....5 እንጨት.....6 ሲሚንቶ/.....7 ሌላ ካለ ይጠቀስ.....99	
320	መሬቱ/ወለሉ የተሰራበት ቁስ ከምንድን ነው የተሰራው	አፈር/አሸዋ.....1 ጭቃ.....2 እንጨት.....3 ሸንበቆ/ቀርከሃ.....4 ቀለም የተቀባ የወለል ጣውላ.....5 አምነ በረድ.....6	

		ሴራሚክ……7 ሲሚንቶ……8 ምንጣፍ/ስጋጃ……9 ሌላ ካለ ይጠቀስ……..99	
321	የቤቱ ግድግዳ የተሰራበት ዋነኛ የግንባታ ቁሳቁስ ምንድነው?	እንጨትና ጭቃ……1 ዘንባባ/ሸንበቆ/ቀርከሃ/ሣር……..2 ጭቃ……..3 ድንጋይ ናጭቃ……..……4 ካርቶን……5 ድንጋይና ሲሚንቶ……6 ጡብ……..7 ጣውላ……8 ብሎኬት……9 ቆርቆሮ……10 ሌላ ካለ ይገለጽ……..……99	

ክፍል 4፡ የእናት ጡት ማጥባት ልምድ ባለፉት 24 ሰዓታት ውስጥ ቀን_____

ቁጥር	ጥያቄ				
401	በአሁኑ ጊዜ እያጠባሽ ነው/አሁንም እያጠባሽ ነው	አዎ.....1 አይ.....2 አላውቅም.....98		አይ ከሆነ ወደ ጥያቄ ቁጥር 403 ይሂዱ	
402	ልጅሽ ባለፉት 24 ሰዓታት ውስጥ ቀንና ማታ ጡት ጠብቶ ነበር	አዎ.....1 አይ.....2 አላውቅም.....98		አይ ከሆነ ወደ ጥያቄ ቁጥር 404 ይሂዱ	
403	ልጅሽ በትናንትናው ዕለት ቀንና ማታ በኩባያ/በማንኪያ ወይም ከሌላ እናት የጡት ወተት አግኝቶ ነበር	አዎ.....1 አይ.....2 አላውቅም.....98			
404	ልጅሽ ቫይታሚን ወይም መድሀኒት በትናንትናው ዕለት ተሰጥቶት ነበር	አዎ.....1 አይ.....2 አላውቅም.....98			
405	ልጅሽ ኦ.አር.ኤስ በትናንትናው ዕለት ተሰጥቶት ነበር	አዎ.....1 አይ.....2 አላውቅም.....98			
406	አሁን ደግሞ ልጅሽ በትናንትናው ዕለት ቀንና ማታ ሊወስዳቸው የሚችላቸውን ፈሳሽ ነገሮችበተመለከተ እጠይቅሻለሁ፡፡ ከሚከተሉት ውስጥ ልጅሽ የትኛውን ወስዷል(ከአንድ በላይ መልስ መስጠት ይቻላል)		አዎ	አይ	አላውቅም
ሀ	ውሃ		1	2	98
ለ	ፎርሙላ/የቆርቆሮ ወተት		1	2	98
ሐ	የላም ወተት		1	2	98
መ	ፍራፍሬ ጭማቂ		1	2	98
ሠ	እርጎ		1	2	98
ረ	ቀጠን ያለ ገንፎ		1	2	98
ሰ	ሻይ/ቡና በወተት		1	2	98
ሸ	አኒታ ቅጠል		1	2	98
ቀ	የአብሽ ውሃ		1	2	98
በ	ሌላ ካለ ይጠቀስ _____				
407	ከሚከተሉት ውስጥ በትናንትናው ዕለት ቀን/ማታ የትኛውን ምግብ ወስዷል		አዎ	አይ	አላውቅም
ሀ	ገንፎ; ዳቦ; ሩዝ ወይም ከጥራጥሬ የተሰሩ ሌሎች ምግቦች		1	2	98
ለ	የታሸጉ የህጻናት ምግቦች		1	2	98
ሐ	እንጀራ/ቂጣ ወይም ሌላ ከጤፍ የተዘጋጁ ምግቦች		1	2	98
መ	ዱባ; ካሮት; ስኳር ድንች		1	2	98
ሠ	ቡላ; ድንች ወይም ከስራስር የተዘጋጀ ምግቦች		1	2	98
ረ	ጎመን አትክልቶች		1	2	98
ሰ	ማንጎ፤ፓፓዬ		1	2	98
ሸ	ሌሎች ፍራፍሬ ወይም አትክልቶች		1	2	98
ቀ	ጉበት፤ኩላሊት፤ ልብ		1	2	98
በ	ስጋ፤ ዶሮ		1	2	98
ተ	እንቁላል		1	2	98
ቸ	አሳ		1	2	98
ነ	ሌላ ካለ ይጠቀስ _____				

ክፍል5፡ የእናት ጡት ማጥባት ልምድ ባለፈው ቀናት ውስጥቀን_____

ቀን 2:-አሁን ደግሞ ባለፉት_____ቀናት ውስጥ ስላለው የጡት ማጥባት ልምድሽ እጠይቅሻለሁ

ቁጥር	ጥያቄ				
501	በአሁኑ ጊዜ እያጠባሽ ነው/አሁንም እያጠባሽ ነው	አዎ.....1 አይ.....2 አላውቅም.....98			አይ ከሆነ ወደ ጥያቄ ቁጥር 503 ይሂዱ
502	ልጅሽ ባለፉት _____ቀናት ውስጥ ቀንና ማታ ጡት ጠብቶ ነበር	አዎ.....1 አይ.....2 አላውቅም.....98			አይ ከሆነ ወደ ጥያቄ ቁጥር 503 ይሂዱ
503	ልጅሽ ባለፈው _____ቀንና ማታ በኩባያ/በማንኪያ ወይም ከሌላ እናት የጡት ወተት አግኝቶ ነበር	አዎ.....1 አይ.....2 አላውቅም.....98			
504	ልጅሽ ባለፉት ሁለት ቀናት ውስጥ ቫይታሚን ወይም መድሀኒት ተሰጥቶት ነበር	አዎ.....1 አይ.....2 አላውቅም.....98			
505	ልጅሽ ባለፉት _____ቀናት ውስጥ ኦ.አር.ኤስ ተሰጥቶት ነበር	አዎ.....1 አይ.....2 አላውቅም.....98			
506	ከሚከተሉት ውስጥ ልጅሽ ባለፉት _____ቀናት ውስጥ ቀንና የትኛውን ወስዷል (ከአንድ በላይ መልስ መስጠት ይቻላል)		አዎ	አይ	አላውቅም
ሀ	ውሃ		1	2	98
ለ	ፎርሙላ/የቆርቆሮ ወተት		1	2	98
ሐ	የላም ወተት		1	2	98
መ	ፍራፍሬ ጭማቂ		1	2	98
ሠ	እርጎ		1	2	98
ረ	ቀጠን ያለ ገንፎ		1	2	98
ሰ	ሻይ/ቡና በወተት		1	2	98
ሸ	አኒታ ቅጠል		1	2	98
ቀ	የአብሽ ውሃ		1	2	98
በ	ሌላ ካለ ይጠቀስ_____				
507	ባለፉት _____ቀናት ውስጥ ቀን/ማታ የትኛውን ምግብ ወስዷል		አዎ	አይ	አላውቅም
ሀ	ገንፎ; ዳቦ; ሩዝ ወይም ከጥራጥሬ የተሰሩ ሌሎች ምግቦች		1	2	98
ለ	የታሸጉ የህጻናት ምግቦች		1	2	98
ሐ	እንጀራ/ቂጣ ወይም ሌላ ከጤፍየተዘጋጁ ምግቦች		1	2	98
መ	ዱባ; ካሮት; ስኳር ድንች		1	2	98
ሠ	ቡላ; ድንች ወይም ከስራስር የተዘጋጀ ምግቦች		1	2	98
ረ	ጎመን አትክልቶች		1	2	98
ሰ	ማንጎ፤ፓፓዬ		1	2	98
ሸ	ሌሎች ፍራፍሬ ወይም አትክልቶች		1	2	98
ቀ	ጉበት፤ ኩላሊት፤ ልብ		1	2	98
በ	ስጋ፤ ዶሮ		1	2	98
ተ	እንኩላል		1	2	98
ቸ	አሳ		1	2	98
ነ	ሌላ ካለ ይጠቀስ_____				