

**COMMUNITY HEALTH DEPARTMENT
MEDICAL FACULTY
ADDIS ABABA UNIVERSITY**

The status of breast-feeding among mothers of children aged less than two years and implications for the occurrence of acute diarrhea, Jimma, Southwest Ethiopia.

A thesis paper to be submitted in partial fulfillment of the requirements for the degree of Masters of Public Health, Faculty of Medicine, AAU.

Biruk k. T/selassie

March, 2002, Addis Ababa

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March, 2002, Addis Ababa

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ABSTRACT

To assess the status of breast-feeding among mothers of children aged less than two years and implications for the occurrence of acute diarrhea; a community based cross-sectional study was conducted in Jimma town, Southwest Ethiopia. A multi-stage systematic sampling technique was applied. Experienced and qualified interviewers were employed and a pre-tested questionnaire was utilized for this purpose. A total of 412 mothers aged 15-49 with under-two years children were taken, after the calculation using the formula to estimate a single population proportions, to examine the status of breast-feeding and implications for the occurrence of acute diarrhea. It was found that out of the total study subjects, 407 (98.8%) of the children had ever breast-fed at any time after birth, and among children who have ever breast-fed, 339 (83.3%) have initiated breast-feeding early within 24 hours after birth.

It was also found that out of the children aged four and above months ($n=333$), 207 (62.2%) of them were predominantly breast-fed, and from the same age group, 23 (6.91 %) have exclusively breast-fed for the first 4-6 months after birth. From the children who have exclusively breast-fed, 7 (30.4%) and from those predominantly breast-fed, 92 (44.4%) developed acute diarrhea. These differences were not statistically significant. However, out of the children who have initiated breast-feeding early after birth, 132 (38.9%) developed acute diarrhea as compared to those who have initiated late after 24 hours. Still the differences are not significantly associated with the occurrence of acute diarrhea ($p<0.107$).

The over all practices of breast-feeding was found to be influenced by the state of attending postnatal care, which showed significant association ($p<0.010$). Mothers who have attended

postnatal clinic are protected from having good practice of breast-feeding, as compared to the others [adjusted OR=0.50 (0.296,0.85)], which is a unique finding contradicts with the general truth. Maternal knowledge about the benefits of breast-feeding, on the other hand, were found to be influenced by variables such as maternal relations to the head of the household ($p<0.029$), attending of formal school ($p<0.008$), attending of antenatal care ($p<0.015$) and attending of health education ($p<0.013$). All these variables showed significant association with the outcome variable, which indicated mothers who have married, attended formal school, antenatal care and health education are in favor of having satisfactory knowledge about the benefits of breast-feeding.

The occurrence of acute diarrhea was found to be influenced by some breast-feeding and health service related characteristics. For example, children from mothers who have unsatisfactory knowledge about exclusivity and duration of breast-feeding are protected from having the risk of acute diarrhea [(adjusted OR = 0.29 (0.12, 0.73)] as compared to those from mothers who have satisfactory knowledge. It is concluded that despite the rapid demographic shifts, maternal practices about breast-feeding is optimal except the practice of exclusivity. However, it can be concluded that mothers' interacting with certain social, cultural, and economic variables, are important factors influencing their child feeding decisions.

Finally, it is recommended that even in this population with free access to preventive medical care, greater efforts should be made to educate mothers regarding risk factors for diarrheal disease identification and the benefits of maintaining breast-feeding during acute diarrhea episodes.

I. INTRODUCTION

Human milk is the most appropriate of all available milk for the human infant because it is uniquely adapted to his or her needs. Breast- milk is the natural food for full-term infants during the first month of life. It is always readily available at the proper temperature and needs no time for preparation. Human milk is also fresh and free of bacteria, which reduce the chance of gastro-intestinal disturbances. The potential life saving and protective effect of breast-milk against enteric pathogens associated with acute diarrhea are more strongly demonstrated in developing countries where there is no safe supply of potable water and effective disposal of human wastes (1).

Breast-feeding is one of the oldest child rearing practices known to mankind. It is also unique and important event in the lives of both the child and the mother. Studies have shown that the advantage of breast-feeding is protective, nutritious and psychosocial. Many factors are known to adversely influence the growth of children including diseases, poverty, ignorance and large family size. In developing countries, where all these factors are rampant, breast-feeding is the major nutrient source from which children can be benefited (2). Human-milk is totally sufficient for proper growth in the first six months of life and can remain important element of the diet for several additional months.

Many authors and doctors have long asserted that for infants, breast-milk is superior to cow's milk or other substitutions. During the 19th century, several medical studies were carried out

in Europe, the results of which indicated that infant morbidity and mortality rates were lower among breast-fed than bottle-fed infants (3).

Moreover, in the past many decades, an increasing amount of scientific research has been carried out throughout the world on the unique properties of human milk. Manufacturers of infant formula have not been able to reproduce all its characteristics, especially its nutritional, biochemical, anti-allergic, anti-infective and immunological specificities. A large proportion of pediatricians now strongly advocate breast-feeding because of its health benefits for the child as well as the mother and because of the advantages of the bonding that it engenders (3). Scientific observations carried out in variety of settings indicate that even today in highly industrialized societies, breast-fed infants tend to show a lower morbidity rate than do bottle-fed infants, and are less prone to obesity and cholesterol build-up later on in life (3).

Breast-feeding is also associated with lower periods of postpartum amenorrhea, which could extend birth intervals and lower fertility. A longer birth interval also provides mothers with the opportunity to fully recover before the next pregnancy and avert maternal depletion (4). In recent years, attention has been given also to the length of time for which breast-milk alone is adequate to support normal infant growth. In most cases the age at which supplementary food should be given is the age at which breast-milk production falls below the requirement (4).

According to a World Health Organization (WHO) study on infant-feeding practice during the first year of life, 98% of infants born in Africa, 96% of those born in Asia and 90% of those born in South America are breast-fed for some part of the period. The period of exclusive

breast-feeding, however, is usually short. In Peru, it was shown that although 99% of infants were breast-fed in the first few months of life, 83% of them received water or tea in addition to breast- milk (11).

According to the Ethiopian Demographic and Health Survey, breast-feeding is nearly universal in Ethiopia, with 96% of children born in the five years preceding the survey have been breast-fed at some time. There are no substantial variations by background characteristics in the percentage of children ever breast-fed (4).

In recent times, in many developing countries, labor force participation by women in the childbearing ages has increased rapidly. Such economic changes present new challenges for women attempting to combine their roles as workers and mothers. Little is known about how these challenges affect infant feeding choices. Nevertheless, decline in breast-feeding have been observed in developed countries since 1930's and then subsequently in the developing countries, particularly in urban areas and among educated and working women. This decline was accompanied by a shift to bottle-feeding. This shift seems to be reversed in developed countries while most developing countries are still practicing it (6).

Breast-feeding promotion is an important intervention for the control of infantile diarrhea. Particularly colostrum protects the new born from intestinal infection by its content of secretory immuno-globuline "A" and other immediately acting factors. It may also induce maturation of the child's gastro- intestinal immune defenses, thus contributing to the protection against diarrheal diseases later in infancy (8). However, with the decline in breast-

feeding, there is a shift to bottle-feeding, which could be hazardous in that the bottle or the content can be contaminated and/or the baby get inadequate supplement as the result of over dilution, which is the case in most developing countries. These predispose young infants and children to diarrhea and/or malnutrition (9).

In Ethiopia, like in other developing countries, diarrhea is a major contributor of morbidity and mortality in young infants and children (9). Several studies indicate that infants not breast-fed have an increased incidence of diarrhea, respiratory and skin diseases as compared to those breast-fed. In Lima, Peru, for example, the incidence rates of diarrheal diseases in those for whom breast-feeding had been discontinued were 15-48% higher than in those breast-fed (9).

Though, there are many factors that promote the transmission of enteric pathogens and thus increase the risk of diarrhea, failing to breast-feed exclusively for the first 4-6 months of life is a most important contributor in developing countries. Thus, the risk of developing acute diarrhea is many times greater in infants who are not breast-fed than in those who are exclusively breast-fed; the risk of death from diarrhea is also substantially greater (10).

The concept that breast-feeding should be reduced or stopped during diarrhea reflects a common belief that giving food will cause stool output to increase and thus make the diarrhea worse, but this is not usually the case, breast-milk is usually well tolerated during diarrhea. Children who continue to breast-feed during diarrhea actually have reduced stool output and a shorter duration of illness than who do not breast-feed. Furthermore, advocates of continued

breast-feeding during acute diarrhea suggests that the practice will prevent deficits of intakes of protein and calories and helps to maintain intestinal mucosa (4).

In the review of data from 22 developing countries, it was seen that the attendance by a medical workers of the most recent delivery was associated with subsequent bottle use (7). Moreover, a national breast-feeding survey in Ethiopia on knowledge, attitude and practice of mothers and health professionals showed that separation of infants and mothers after delivery in hospitals result in late initiation of breast-feeding and giving newborn glucose water by bottle before lactation is initiated (7). In a survey conducted on patterns of infant feeding at Jimma town, 89% of studied mothers claimed that breast-feeding alone is sufficient up to 4-6 months of age. However, 2.3% of children were not initiated on breast-feeding or were completely weaned- off the breast-feeding before one month of age (11).

II. LITERATURE REVIEW

- **OVERVIEW OF BREAST-FEEDING**

Breast-feeding has been known to be the best traditional way to feed infants among the urban and rural communities (23). According to World Health Organization expert committee, its multiple benefits for the health of the infant and the mother greatly outweigh bottle-feeding (23). Breast-feeding also delays the resumption of ovulation and thus induces a considerable length of infecundity beyond that resulting from normal postpartum ammenorrhoea. The Contraceptive effect of breast-feeding has been known for several generations, but it has been only in recent times that researchers have attempted to quantify its role regarding birth interval (23).

Studies showed that the advantage of breast-feeding is protective, nutritious and psychosocial. Many factors are known to influence the growth of children including weaning practices, diseases, poverty, ignorance and large family size. In developing countries, where all these factors are rampant and in its worst form, breast- feeding is the major nutrient source from which children can be benefited (12). Human-milk is totally sufficient for proper growth in the first six months of life and can remain important element of the diet for several additional months.

In a study of infant feeding practices among mothers who had already been identified during pregnancy, a sub-sample of 80 children was followed for four to eight months of those fed on

breast-milk alone, 76% achieved 90% of the expected weight gain for children of that age. In the mixed feeding group, the expected weight was attained by 60% of the children, among those on formula alone, by 29% (3).

According to the Ethiopian Demographic and Health Survey, breast-feeding is nearly universal in Ethiopia, with 96% of children born in the five years preceding the survey have been breast-fed at some time. There are no substantial variations by background characteristics in the percentage of children ever breast-fed (4).

Though, initiation of breast-feeding is universal in most developing countries, cessation and early supplementations of breast-feeding have been observed in a substantial proportion of cases. The changes in the types of supplements used and in the breast-feeding duration are analogous to the changes observed in industrialized countries after the mid 19th century. Many of the associated factors are also similar (urbanization, female participation in labor force, increased availability of processed milk and their promotion by companies) (9).

However, with the decline in breast-feeding, there is a shift to bottle-feeding, which could be hazardous in that the bottle or the content can be contaminated and/or the baby get inadequate supplement as the result of over dilution, which is the case in most developing countries. These predispose young infants and children to diarrhea and/or malnutrition (9).

A study done in Africa-American populations reported that among 66 respondents, only three subjects (4.5%) indicated that they planned to breast feed exclusively, while an additional 11

subjects (16.7%) reported plans to use a combination of bottle-feeding and breast-feeding. In the same study women with less than 12 years of education were less likely to report anticipated breast-feeding. Otherwise, breast-feeding plans were not associated with demographic features or with reproductive characteristics.

Another qualitative study that explored minority teen mothers' perceptions of breast-feeding and the influences on infant feeding choices among Latin and African-American girls in Chicago indicated that adolescents' perceptions about the problems and benefits of breast-feeding were influenced by the elderly. Teens recognized that breast-feeding offered many benefits including facilitating maternal-child bonding and promoting the baby's health, but concern was raised regarding a potential for excessive attachment between teen mother and baby. Fear of pain, embarrassment with public exposure, and unease with the act of breast-feeding acted as barriers for teenagers who were considering breast-feeding (13).

A multidisciplinary study about breast-feeding practices among employed Thai women in Chiang Mai, investigated work and infant-feeding decisions. Resumption of employment generally had negative effects on breast-feeding rates and duration. At six months postpartum, women who worked inside the home breast-fed more than those working in the formal sector at jobs with inflexible hours [home (80%), public sector (37%), private sector (39%)]. Women working outside the home for a longer period or had shift jobs encountered many obstacles to maintaining breast-feeding, and most gave it up within one month after resuming employment (13).

A survey conducted on the practices of infant feeding and the influencing factors in United Arab Emirates, showed that 46% of infants were breast-fed for 4-6 months. The mothers' nationality and educational status were significant influences on the mothers' decision to exclusively breast-feed, for how long and when to introduce supplementary foods (14). A prospective, randomized descriptive study in Turkey to determine the knowledge of women about lactational amenorrhea and contraceptive properties of breast-feeding, showed that more than 53% of women were using one of the modern contraceptive methods. Nearly 52% of women were not aware of the contraceptive property of breast-feeding and 48.16% did not know the importance of frequency and duration of sucking on fertility reducing effect of lactation (26).

Study done, on feeding patterns in the first two years of life in Iraq, showed that approximately 91% of infants were exclusively breast-fed at one week of age with a further 4% receiving supplementary foods at this stage. Inadequate supply of human milk was the most common reason reported by mothers for discontinuing breast-feeding (28). Moreover, in a study conducted in Nigeria, birth weight showed significant association with exclusive breast-feeding (29). Another study in Nigeria showed that women breast-fed their infants on demand and to two years, because milk is universally accepted as the best food for babies and breast-feeding spaces births (7).

- **BREAST-FEEDING AND DIARRHEAL DISEASES**

Several studies indicate that infants not breast-fed have an increased incidence of diarrhea, respiratory and skin diseases compared to those breast-fed. In Lima, Peru, for example, the incidence of diarrheal diseases in those for whom breast-feeding had been discontinued were 15-48% higher than in those of the breast-fed (9).

Diarrheal disease claims the lives of at least five million children per year and is a major contributor to malnutrition in developing countries. A variety of infectious agents cause diarrhea through several pathogenic mechanisms. Bacteria such as *Shigella* can directly invade the intestinal mucosa, *Vibrio Cholerae* and enterotoxigenic *Escherichia coli* can produce toxin that alter cellular absorption and secretions. Rotavirus appears to cause 30-40% of diarrhea in toddlers (10). Diarrhea frequently accompanies parasitic infestations and infections in other parts of the body. Several methods, including improvement of water supplies, sanitation and administration of vaccines and antibodies may be useful in preventing morbidity and mortality due to diarrhea. Oral rehydration to replace fluid and electrolytes, accompanied by attention to early feeding and encouragement of breast-feeding, is the most effective and economical intervention currently available (10).

A Population based case control study conducted in an urban area of North India, indicated that promoting exclusive breast-feeding might reduce the persistence of diarrhea over and above its effect in decreasing the incidence of acute diarrhea (15). Another case control study about breast-feeding and oral rehydration at home, showed that withdrawal of breast-feeding

during diarrhea was associated with a five times higher risk of dehydration compared with continuation of breast-feeding during diarrhea at home (15).

Furthermore, a case control study in Nigeria, showed diarrhea reoccurrence at the given period of time was less in the intervention group than controls. It was concluded that focused breast-feeding counseling could increase exclusive breast-feeding and reduce the prevalence of diarrhea in rural communities (16). Concerning the initiation of breast-feeding, a case control study done elsewhere on whether age at the start of breast-feeding influences the occurrence of infantile diarrhea, has shown that the cases tended to have started breast-feeding later after birth than the diarrhea free controls (8).

According to a study on the clinical outcome of breast-feeding during acute diarrhea, children who continued to breast-feed during treatment with oral rehydration solutions passed, on average, a smaller volume of diarrhea stools and recovered from diarrhea sooner after the start of treatment. Their requirement for oral rehydration fluid was significantly reduced. Therefore, it was concluded that breast-feeding exerts beneficial effect on the course and outcome of acute diarrhea by reducing the number and volume of diarrhea stools (17).

A small Scale study conducted in Pakistan has concluded that feeding practices may have an important impact on diarrheal diseases in developing countries. The study evaluated feeding practices in three groups of male children aged 6-36 months; 100 with persistent diarrhea, 79 with acute diarrhea, and 86 in a comparison group. Although greater than 95% of all infants

were breast-fed, delayed initiation of breast-feeding was more common in the diarrhea groups (20).

- **Breast-feeding in the Ethiopian situation**

According to the Ethiopian Demographic and Health Survey, breast-feeding is nearly universal in Ethiopia, with 96% of children born in the five years preceding the survey have been breast-fed at some time. There are no substantial variations by background characteristics in the percentage of children ever breast-fed (4).

An early initiation of breast-feeding is important for number of reasons; early suckling benefits mothers because it stimulates breast-milk production and releases a hormone that helps the uterus to contract and reduce postpartum blood loss. The first breast milk contains colostrum, which is highly nutritious and has antibodies that protect the new born from diseases. Early initiation of breast-feeding fosters bonding between mother and child. Based on the National Demographic and Health Survey in Ethiopia, one in two children are breast-fed within one hour of birth, and nearly three in four within one day of birth.

In a cross sectional study, in Southwest Ethiopia, out of those who were exclusively breast-fed only 12% had diarrhea, while among those partially breast-fed, 40% had diarrhea. The difference in the occurrence of acute diarrhea among exclusively and partial breast-fed infants was statistically significant ($p < 0.000$). When infants with partial breast-feeding were

contrasted with those on exclusive breast-feeding, a relative risk of developing diarrhea of 5.2 (3.00,9.10) was obtained (21).

In a descriptive cross-sectional study on mothers' knowledge and practice related to weaning in Southwest Ethiopia, 40% were reported to have started on weaning food when aged 4-6 months. Of the children who were reported to be exclusively breast-fed, 34% were older than seven months (30). In a survey conducted on patterns of infant feeding in Jimma town, 89% of studied mothers claimed that breast-feeding alone is sufficient up to 4-6 months of age. However, 2.3% of children were not initiated on breast-feeding or were completely weaned-off the breast-feeding before one month of age (11).

In a survey in Addis Ababa, exclusive-breast-feeding rate in those less than 4 months of age was found to be 32%. Timely complementary feeding rate in the age group 6-9 months was, however, found to be 57.4%. Mothers who did not initiate breast-feeding at all were 2.8%. About 44% of the infants were bottle-fed. The most commonly mentioned problems associated with breast-feeding were found to be "insufficient breast- milk" (6).

Another cross-sectional study on practices of breast-feeding among mothers working in Akaki Textile Factory and housewives who have children of the same age group indicated that prevalence of breast-feeding among factory working mothers was found to be 77.8% and that of housewives 91.7% (32).

A study done in Jimma town to determine the socio-cultural factors related to breast-feeding, showed that the prevalence of breast-feeding was 96.5%. The mean duration of exclusive breast-feeding was 4.4 months and the mean duration of overall breast-feeding was 15 months. Forty three percent of mothers gave food supplements for their children by the age of 4-6 months. Additionally, it was found that 60% of the mothers breast-fed for more than 18 months (2).

In the same area, Jimma town, Southwest Ethiopia, a community based cross-sectional survey to assess the knowledge, attitude and practice of mothers towards exclusive breast-feeding showed that among mothers studied, 87% had adequate knowledge about exclusive breast-feeding, while most (90%) had positive attitude towards exclusive breast-feeding. However, one third (33%) of the mothers still agreed on early introduction of cow's milk, as a supplement since they believed it would increase their babies' weight (11).

Although knowledge and attitude towards exclusive breast-feeding among mothers was found to be high, the findings showed that only 25% of mothers offered breast milk alone to their babies in the first 4-6 months of infant life. Hence, this study documented a discrepancy between mothers' knowledge, attitude and practice of exclusive breast-feeding (11).

Rationale of the study

Mothers and children constitute the majority of the population and they are the more vulnerable groups. Breast-feeding is a natural resource, needs less energy for preparation, it costs no money, provides holistic nutritional values for the infants and it is free of microbes. As a consequence of cessation of breast-feeding and early introduction of weaning diet common childhood diseases such as acute diarrhea arise and lead to high rate of morbidity and mortality in developing countries such as Ethiopia. It is important to address the issue of breast-feeding and mothers' knowledge and practice of breast-feeding in general, and breast-feeding during occurrence of acute diarrhea in particular.

However, very few studies were conducted to assess the status of breast-feeding in relation to occurrence of acute diarrhea. It is, therefore essential to examine the existence of non-optimal breast-feeding and identify the segment of population in which these practices exist so that well targeted interventions could be undertaken. This study is, thus conducted to assess the status of breast-feeding among mothers of children aged less than two years and implications for the occurrence of acute diarrhea in Jimma town, south-west Ethiopia.

III. OBJECTIVES

3.1 General Objective

The general objective of the study is to assess the status of breast-feeding among mothers of children aged less than two years and explain implications for the occurrence of acute diarrhea in Jimma town, Southwest Ethiopia.

3.2 Specific Objectives

1. To assess the current state of breast-feeding among the target population.
2. To assess the knowledge of mothers of children aged less than two years about breast-feeding and factors associated with the condition.
3. To assess the current breast-feeding practices of mothers and factors associated with the condition.
4. To explore the relationship between the knowledge, practice and other maternal characteristics regarding breast-feeding and the occurrence of acute diarrhea among the children.

IV. METHODOLOGY

- **Study design**

A descriptive cross-sectional community-based study was conducted among mothers of children aged less than two years from December 2001 to January 2002 in Jimma town, South-west Ethiopia.

- **Study Area**

Jimma town is the capital city of Jimma zone, which is one of the 12 zones of Oromiya region covering an area of 14950 sq. km. This town is located 335 km far from Addis Ababa in the southwest direction. The majority of residents are Oromo in ethnicity and Muslim in religion.

The town at this time is independently bounded in a special zone with separate administrative and accountability from the zonal administrative counsel. There are three keftagnas and 19 kebeles in the town. According to the housing and population census conducted in 1994, the total population size of the town as projected to the year 2001 is 106,285, of which 52,474 are males and 53,811 females.

As to the health service facilities, there are three governmental health facilities: One hospital, one health center and one clinic. There are also non-governmental health facilities owned by NGO's and private owners (33).

- **Source and study population**

The source populations for the study are all mothers of children aged less than two years residing in Jimma town. The proportion of children less than two years constitutes 7.7% of the total population (34). Therefore, the required sample sizes from each kebeles were calculated from the sampling frame produced for each kebele according to the size of the population (proportionate sample size allocation).

- o **Exclusion Criteria**

Since the study subjects are mother-child paired groups, children aged less than two years who have not mothers were excluded from the study.

- **Sampling procedure and sample size determination**

A multistage systematic random sampling technique was used in sampling the study subjects. All the three keftagnas were included in the sampling frame and out of the total 19 kebeles, 10 of them were randomly selected using the random number table proportional to the size of kebeles in each keftagnas.

The total population size of the ten kebeles, as it was enumerated in the 1994 housing and population census, was 49432, out of which 3,805 were estimated to be children less than two years age. It is then from these target population that the required sample size was taken according to the size of sample frame in each kebele.

The sample size required for the study was calculated using the formula to estimate a single population proportions.

$$n = \left[\frac{(Z_{\alpha/2})^2 p(1-p)}{d^2} \right] D$$

Where: n = required sample sizes

$z_{\alpha/2}$ = critical value for normal distribution at 95% confidence interval which equals to 1.96 (z value at $\alpha = 0.05$)

P = established prevalence from previous studies of the topic of interest (breast -feeding) in the locality.

d = an absolute precision (margin of error)

D = Design effect

Assumptions: With the assumptions of 95% confidence interval, margin of error ($d = 2.5\%$), prevalence of 97% ($p = 0.97$) and design effect for the two-stage sampling ($D = 2$) was applied. The formula yields $n = 358$, adding 15% contingencies for non-response, the required sample sizes were 412 mother-child paired subjects.

To get the individual sample units (subjects) at household level, a map of each kebele was taken from the municipality. The center of each kebele was located and to start with the first house a lottery method was used. Once the direction was located using the lottery method, then it was started from the first household, which was immediately found from that direction

and systematically continued by jumping every 5-house unit to get the next sample from the next household. Since the sample sizes for each kebele was allocated for each direction accordingly, continuing with the procedure was considered up to the required samples for that direction were obtained. The next direction was followed to be the opposite, for example, west for east, and so forth. In order to avoid confusion and/or overlapping in getting the samples in a given kebeles a consistent coding and marking was done for each visited households.

The required sample sizes for each kebele are distributed according to the density of households and/or placement of houses to each direction. A great attention was taken not to select samples from one direction or places that could not be representative. The boundaries of each kebele were also carefully studied in order not to overlap with adjacent near by kebeles.

- **Data collection techniques / procedures**

Structured questionnaire was developed in such a way that all the variables to be assessed were included. Questionnaires was developed first in English then translated to Amharic version. The questionnaires were pre-tested before the actual data collection is begun. In fact, some information using the created variables was not fully addressed by the respondents during the time of pre-testing. Therefore, appropriate amendments of the questionnaire were made before the actual data collection started. Mean while, a close follow-up was made

whether the questionnaires were appropriately filled by the trained interviewers during the house-to-house survey.

Finally, eligible target groups were selected from each selected house units according the set criteria. One eligible, child aged less than two years and who have mother at the time of survey, from each household was selected and if eligible child was not found a replacement technique was used, just replaced from the consecutive households in the same direction. An interesting issue in the data collection period was, all the selected mother-child study subjects according the set criteria were volunteers and participated in the study. Participants who were encountered difficulties during the specific survey time were asked to have an appointment for another time; hence, the interviewing was done on the time when the participants agree.

• Operational definitions of terms related to the study

- Exclusive breast-feeding: Applies to the infants, have received only breast-milk from his/her mother, and no other liquids or solids with the exception of drops or syrup consisting of vitamins, mineral supplements or medicines.

- Predominant breast-feeding: The infants' predominant nourishment has been breast-milk. However, the infant may have received water and water based drinks such as fruit juice, plain water, salt-solution, sugar-solution, ORS, vitamins and minerals. The infant predominately breast-fed did not, however, take food-based fluids (like cereal gruel) or solid foods.

- Full term breast-feeding: An exclusive breast-feeding and predominant breast-feeding constitute together full term breast-feeding.
- Timely Complementary feeding: The child is six to nine months of age and has already received both breast-milk and solid or semi-solid food (infants receiving breast-milk and cereal gruel are also put under this category).
- Early cessation of breast-feeding: Complete cessation of breast-feeding before the child's first birthday.
- Acute diarrhea: Defined as three or more loose or watery stool in a day. The term acute can also be defined as diarrhea started suddenly and may continue for several days.

- **Variables**

Independent Variables such as sociodemographic, breast-feeding and health service related characteristics, and dependent variables such as knowledge and practice of breast-feeding and occurrence of acute diarrhea, are included in the questionnaire (enclosed in the appendices).

- **Data processing**

The raw data was entered, cleaned and analyzed using statistical soft wares such as EPI-INFO version 6.0 and SPSS version 10.0. Descriptive statistics, the chi-square test, and crude and adjusted odds ratio were also used to measure association between variables.

- **Data quality issues**

To maximize reliability and validity of the variables in the study, special attention was given to the construction of the questionnaire, that is the wording of the questions, flow of alternatives and related issues were carefully examined during the designing of the questionnaire. Appropriate design and sampling procedures was also carefully considered to maintain the quality of the study.

Selection of data collectors, training of the interviewers and pre-testing of the designed questionnaire were seriously undertaken in order to maintain the quality of the study. A mandatory and routine procedure during the data collection time was continuous supervision and/or follow up of the data collectors.

- **Ethical considerations**

Ethical clearance was obtained from the Faculty of Medicine, AAU. At the locality necessary arrangements were made concerning this issue. Letters were written first from the Zonal Administrative Office to the Municipality, again, individual letters was written for each respective kebele in order to get co-operation, participation and let them know ahead of time about the research work. At the time of data collection, a verbal consent was taken from the participants to confirm whether they are willing to participate. Those not willing to participate were given the right to do so. Confidentiality of responses has been also ensured throughout the research process.

V. RESULTS

1. Demographic Characteristics

The age range of mothers considered in the study was 15-49 years, which is a childbearing age range. Out of the total study subjects, 49 (11.9%) were young mothers aged 15- 19 years, while 38(9.2%) were aged 35 and above years. The mean ($\pm$ Standard deviation) age of the mothers was nearly 25 years (5.47). The age range of children considered in this study was 0-23 months, which is an optimal age range for breast-feeding. The majority of children 118 (28.6%) were below five months. The frequency distribution of children decreases as the age increases. The maximum and minimum numbers of children were found in the two extreme months of age (Table 1). The mean ($\pm$ standard deviation) age of the children was 10.4 months (6.75).

The male to female ratio of the children was 1.05:1. Males were 51.2% of the total study subjects. The majority of the mothers (89.8%) were housewives, and the rest were daughter, relatives or house servants. Even though, polygamy is common among Muslim religion, there were insignificant numbers of such marriages in the study subjects. In this study Christians were 61.2% of the study subjects. Four major Ethnic groups were identified of which, Oromo constitutes the larger proportion (41.7%), followed by Amhara (20.1%). Among the study subjects (81.1%) have attended formal education. Out of whom, 14.8%, 30.8%, 29.4% and 6.1% have attended primary school, medium level, secondary school and higher education respectively. Around ninety four percent of the respondents were married (Table 1).

Among the total study subjects, 20.1% are workers, which include both governmental employee and private firm workers, and 79.9% housewives, students and others. The average monthly income of the respondents ranged from less than hundred up to greater than 500 Birr (Table 1). Majority of the respondents, 407 (98.8%), use water from tap (pipe), protected spring or well water sources. Ninety seven percent of the respondents had 1-5 children at the time of the study.

Table 1: Frequency distribution of selected sociodemographic characteristics among mother-child paired subject groups of the study; Jimma town, Southwest Ethiopia, 2002.

Sociodemographic characteristics of mother-child paired study subjects (n=412)		
Variables	Numbers	Percent
Age of mother in years		
15-19	49	11.9
20-24	153	37.1
25-29	127	30.8
30-34	45	10.9
35 and above	38	9.2
Age of child in months		
0-5	118	28.6
6-11	111	26.9
12-17	101	24.5
18-23	82	19.9
Sex of child		
Male	211	51.2
Female	201	48.8
Relation of mother to head of household		
Wife	370	89.8
Other than wife	42	10.2
Religion		
Muslim	160	38.8
Christian	252	61.2
Ethnicity		
Oromo	172	41.7
Amhara	83	20.1
Dawro	58	14.1
Guragie	46	11.2
The rest	53	12.9
Attended formal school		
Yes	334	81.1
No	78	18.9

Marital status		
Married (active)	349	84.7
Married (not active)	37	9.0
Single	26	6.3
Occupation		
Worker	83	20.1
Not worker	329	79.9
Average monthly income		
0-100	99	24.0
101-200	122	29.6
201-500	104	25.2
500 and above	65	15.8
Don't know	22	5.3

2. Health service related characteristics

About eighty-two and fifty-seven percents of the mothers had followed antenatal and postnatal care while they were pregnant and after birth of the index child respectively. The mean ($\pm$ Standard deviation) number of times antenatal follow-up was 8.71 (2.87) throughout the gestational age.

A total of 282 (68.4%) of the mothers have got health education particularly about breast-feeding. In addition to health education about breast-feeding, mothers has also got health education about when to start a timely complementary feeding, the disadvantage of offering bottle-feeding, and other related topic. Therefore, in order to examine whether mothers has got information about breast feeding and related topics in any time of their bearing the youngest child, the responses of the participants as to whether they got or not, were scored. Hence, by considering all the topics that have been conducted among mothers as hundred percent; those mothers who have got health education about 75% and above of the respected topics, were labeled as satisfactory, while for those less than 75% as unsatisfactory. Based on this assumption, 81 (19.7%) of the mothers have got satisfactory health education while 331 (80.3%) got unsatisfactory health education on the respective topics (Table 2).

Two hundred sixty nine (65.3%) of the mothers gave birth in health facilities for the youngest child. Out of the total children aged less than two years, 401 (97.3%) were ever immunized (Table 2), out of whom, 194 (47.1%) had taken the required antigens (fully immunized).

Table 2: Frequency distribution of breast-feeding and health service related variables among mother-child paired subject groups of the study; Jimma, Southwest Ethiopia, 2002.

Distribution of breast-feeding and other health related variables		
Variables	Number	percent
ANC follow-up		
Yes	338	82.0
No	74	18.0
PNC Follow-up		
Yes	235	57.0
No	177	43.0
Health education (related topics)		
Satisfactory	81	19.7
Unsatisfactory	331	80.3
Place of birth of the index child		
Health facilities	269	65.3
Outside health facilities	143	34.7
Child immunization		
Yes	401	97.3
No	11	2.7
Initiation of breast-feeding (n = 407)		
Within 24 hours	339	83.3
After 24 hours	68	16.7
Frequency of breast-feeding (n = 337)		
≥ 6 times per day	144	42.7
< 6 times per day	193	57.3
Exclusive breast-feeding (n = 333)		
≥ 4 months	23	6.9
< 4 months	310	93.1
Knowledge about exclusive and duration of breast-feeding		
Satisfactory	32	7.8
Unsatisfactory	380	92.2
Hygienic practice		
Good	175	42.5
Poor	237	57.5

3. Status of Breast-feeding

In this study, 407 (98.8%) of the children had ever breast fed at least once starting from birth up to the time of the survey. Only 5 (1.2%) of the subjects were never breast-fed, mainly because of maternal problem especially of the breast.

- **Initiation of breast-feeding**

About 339 (83.3%) of the mothers initiated breast-feeding for their children within 24 hours after birth, out of whom 262 (64.4%) started immediately within one hour, while 68 (16.7%) of them started breast-feeding late after 24 hours after birth. Forty-three (87.8%) of mothers aged 15-19 years have initiated breast-feeding for their children early within 24 hours after birth as compared to those aged 35 and above years, out of whom 33 (91.7%) initiated breast-feeding for their children for the same time (Table 3).

There was no sex difference among the children in initiating breast-feeding. One hundred seventy two (82.7%) males and 167 (83.9%) females started breast-feeding within 24 hours after birth. Out of the total housewives, 305 (83.6%) initiated breast-feeding within 24 hours after birth, while out of the non-housewives, 34 (81.0%) initiated for the same time. From the total Muslim mothers, 136 (86.1%) started breast-feeding within 24 hours after birth, as compared to the Christian mothers, of whom 196 (81.5%) initiated breast-feeding for the same time (Table 3).

Initiation of breast-feeding has got slight differences in proportion among the different ethnic groups. For example, out of the mothers from Amhara ethnic groups, 74 (90.2%) initiated breast-feeding for their children within 24 hours as compared to the mothers from the minor ethnic groups, of whom 37 (69.8%) initiated for the same time. Among the mothers who attended formal education, 269 (81.8%) initiated within 24 hours after birth as compared to those who have not attended formal education (Table 3).

From the total single mothers, 20 (76.9%) started breast-feeding within 24 hours after birth, while out of the married (married active) mothers, 287 (83.4%) initiated breast-feeding for the same time. There was no difference in proportion among mothers who passed their time in the home and those outside the home, who are workers both in the governmental and private organizations. From the total mothers who are workers, 66 (82.5%) started breast-feeding within 24 hours, which are nearly the same with those who are not workers (Table 3).

Table 3: The time of initiation of breast-feeding among children aged less than two years, by sociodemographic and health service related variables; Jimma, southwest Ethiopia, 2002.

Initiation of breast-feeding (n=407)		
Variables	Within 24 hours Number (%)	After 24 hours Number (%)
Age of mothers in years		
15-19	43 (87.8)	6 (12.2)
20-24	125 (82.8)	26 (17.2)
25-29	97 (77.0)	29 (23.0)
30-34	41 (91.1)	4 (8.9)
35 and above	33 (91.7)	3 (8.3)
Sex of child		
Male	172 (82.7)	36 (17.3)
Female	167 (83.9)	32 (16.1)
Maternal relation to head of household		
Wife	305 (83.6)	60 (16.4)
Other than wife	34 (81.0)	8 (19.0)
Religion		
Muslim	136 (86.1)	22 (13.9)
Christian	203 (81.5)	46 (18.5)
Ethnicity		
Oromo	143 (84.6)	26 (15.4)
Amhara	74 (90.2)	8 (9.8)
Dawro	47 (81.0)	11 (19.0)
Guragie	38 (84.4)	7 (15.6)
The rest	37 (69.8)	16 (30.2)
Attended formal school		
Yes	269 (81.8)	60 (18.2)
No	70 (89.7)	8 (10.3)
Marital status		
Married (active)	287 (83.4)	57 (16.6)
Married (not active)	32 (86.5)	5 (13.5)
Single	20 (76.9)	6 (23.1)

Occupation		
Worker	66 (82.5)	14 (17.5)
No worker	273 (83.5)	54 (16.5)
Average monthly income		
0-100	79 (79.8)	20 (20.2)
101-200	107 (87.7)	15 (12.3)
201-500	82 (81.2)	19 (18.8)
500 and above	51 (79.7)	13 (20.3)
Don't know	20 (95.2)	1 (4.8)
ANC follow-up		
Yes	279 (83.8)	54 (16.2)
No	60 (81.1)	14 (18.9)
PNC follow-up		
Yes	192 (82.4)	41 (17.6)
No	147 (84.5)	27 (15.5)
Health education (related topics)		
Satisfactory	67 (84.8)	12 (15.2)
Unsatisfactory	272 (82.9)	56 (17.1)
Place of birth of the index child		
Health facilities	219 (83.0)	45 (17.0)
Outside health facilities	120 (83.9)	23 (16.1)
Sum total	339 (83.3%)	68 (16.7%)

- **Current breast-feeding (Still breast-feeding)**

Irrespective of their age out of the total study subjects, 337 (82.8%) were still on breast-feeding. Among the mothers aged 15-19 years, 42 (85.7%) were continuing breast-feeding for their children since the date of data collection as compared to those mothers aged 35 and above, of whom 29 (80.6%) continued breast-feeding. Among the total children aged 0-5 months, 2 (1.7%) have ceased breast-feeding as compared to those children 18-23 months, of whom 31 (38.8%), ceased at the time of data collection (Table 4).

Among the total Muslim mothers, 141 (89.2%) were continuing breast-feeding, while out of those Christian mothers, 196 (78.7%) were continuing. Around 80% of mothers who attended formal education were continuing breast-feeding; while out of those who have not attended 93.6% were still breast-feeding for their children. On the other hand, 84% of mothers who are not worker were continuing breast-feeding as compared to those who are workers (Table 4).

Table 4: Still breast-feeding among all age groups of children aged less than two years, by socio-demographic and health service related variables; Jimma, southwest Ethiopia, 2002.

Still breast-feeding (n=407)		
Variables	Yes Number (%)	No Number (%)
Age of mother in years		
15-19	42 (85.7)	7 (14.3)
20-24	132 (87.4)	19 (12.6)
25-29	97 (77.0)	29 (23.0)
30-34	37 (82.2)	8 (17.8)
35 and above	29 (80.6)	7 (19.4)
Age of child in months		
0-5	115 (98.3)	2 (1.7)
6-11	94 (86.2)	15 (13.8)
12-17	79 (78.2)	22 (21.8)
18-23	49 (61.2)	31 (38.8)
Sex of child		
Male	168 (80.8)	40 (19.2)
Female	169 (84.9)	30 (15.1)
Relation of mother to head of household		
Wife	301 (82.5)	64 (17.5)
Other than wife	36 (85.7)	6 (14.3)
Religion		
Muslim	141 (89.2)	17 (10.8)
Christian	196 (78.7)	53 (21.3)
Ethnicity		
Oromo	143 (84.6)	26 (15.4)
Amhara	57 (69.5)	25 (30.5)
Dawro	52 (89.7)	6 (10.3)
Guragie	38 (84.4)	7 (15.6)
The rest	47 (88.7)	6 (11.3)
Attended formal school		
Yes	264 (80.2)	65 (19.8)
No	73 (93.6)	5 (6.4)

Marital status		
Married (active)	281 (81.7)	63 (18.3)
Married (not active)	32 (86.5)	5 (13.5)
Single	24 (92.3)	2 (7.7)
Occupation		
Worker	62 (77.5)	18 (22.5)
Not worker	275 (84.1)	52 (15.9)
Average monthly income		
0-100	88 (88.9)	11 (11.1)
101-200	108 (88.5)	14 (11.5)
201-500	83 (82.2)	18 (17.8)
500 and above	41 (64.1)	23 (35.9)
Don't know	17 (81.0)	4 (19.0)
ANC follow-up		
Yes	266 (79.9)	67 (20.1)
No	71 (95.9)	3 (4.1)
PNC Follow-up		
Yes	190 (81.5)	43 (18.5)
No	147 (84.5)	2 (15.5)
Health education (related topics)		
Satisfactory	57 (72.2)	22 (27.8)
Unsatisfactory	280 (85.4)	48 (14.6)
Place of birth of the index child		
Health facilities	205 (77.7)	59 (22.3)
Outside health facilities	132 (92.3)	11 (7.7)
Sum total	337 (82.8%)	70 (17.2%)

- **Frequency of breast- feeding**

Mothers were asked whether their last child was breast-fed on demand, schedule or on both. One hundred forty four (42.7%) were breast-fed six and above times per day, while 193 (57.3%) breast-fed less than six times per day. Among mothers aged 15-19 years, 50% breast-fed for ≥ 6 times per day, while among mothers aged 35 and above years, 34.5% breast-fed their children ≥ 6 times per day. Out of 168 male children, 75 (44.6%) have fed six and above times per day versus 69 (40.8%) female fed ≥ 6 times per day (Table 5).

The relation of mothers to head of the household showed difference in proportion of the intensity of breast-feeding. Among the 301 housewives, 131 (43.5%) have fed breast-milk six and above time per day, while out of those other than housewives, 13 (36.1%) breast-fed their children six and above times per day. Nearly, 47% of Muslin mothers offered breast-milk for ≥ 6 times per day, while around 40% of Christian mothers provided breast-milk six and above times per day (Table 5).

Around 31% of mothers who work in either governmental or private organizations breast-fed their children for ≥ 6 times per day, while 46% of not-worker mothers have breast-fed for the same frequency. In addition, 35.1% of mothers who gave birth inside the health facilities and 54.5% of those who gave birth outside the health facilities breast-fed for their children for ≥ 6 times per day respectively. Fifty one percent of mothers who have less than or equal to 100 birr monthly income breast-fed six and above times per day as compared to those who have 500 and above birr, of which nearly 37% have breast-fed in the same manner (Table 5).

Table 5: Frequency distribution of the intensity of breast-feeding among children aged less than two years, by selected socio-demographic and health service related variables; Jimma, Southwest Ethiopia, 2002.

Frequency of breast-feeding (n=337)		
Variables	≥6 times per day Number (%)	<6 times per day Number (%)
Age of mothers in years		
15-19	21 (50.0)	21 (50.0)
20-24	59 (44.7)	73 (55.3)
25-29	36 (37.1)	61 (62.9)
30-34	18 (48.6)	19 (51.4)
35 and above	10 (34.5)	19 (65.5)
Age of children in mothers		
0-5	55 (47.8)	60 (52.2)
6-11	39 (41.5)	55 (58.5)
12-17	35 (44.3)	44 (55.7)
18-23	15 (30.6)	34 (69.4)
Sex of child		
Male	75 (44.6)	93 (55.4)
Female	69 (40.8)	100 (59.2)
Relation of mother to head of household		
Wife	131 (43.5)	170 (56.5)
Other than wife	13 (36.1)	23 (63.9)
Religion		
Muslim	66 (46.8)	75 (53.2)
Christian	78 (39.8)	118 (60.2)
Ethnicity		
Oromo	61 (42.7)	82 (57.3)
Amhara	22 (38.6)	35 (61.4)
Dawro	29 (55.8)	23 (44.2)
Guragie	17 (44.7)	21 (55.3)
The rest	15 (31.9)	32 (68.1)
Attended formal school		
Yes	112 (42.4)	152 (57.6)
No	32 (43.8)	41 (56.2)

Marital status		
Married (active)	122 (43.4)	159 (56.6)
Married (not active)	13 (40.6)	19 (59.4)
Single	9 (37.5)	15 (62.5)
Occupation		
Worker	19 (30.6)	43 (69.4)
Not worker	125 (45.5)	150 (54.5)
Average monthly income		
0-100	45 (51.1)	43 (48.9)
101-200	49 (45.4)	59 (54.6)
201-500	30 (36.1)	53 (63.9)
500 and above	15 (36.6)	26 (63.4)
Don't know	5 (29.4)	12 (70.6)
ANC follow-up		
Yes	108 (40.6)	158 (59.4)
No	36 (50.7)	35 (49.3)
PNC Follow-up		
Yes	81 (42.6)	109 (57.4)
No	63 (42.9)	84 (57.1)
Health education (related topics)		
Satisfactory	26 (45.6)	31 (54.4)
Unsatisfactory	118 (42.1)	162 (57.9)
Place of birth of the index child		
Health facilities	72 (35.1)	133 (64.9)
Outside health facilities	72 (54.5)	60 (45.5)
Sum total	144 (42.7%)	193 (57.3%)

- **Predominant breast-feeding**

Predominant breast-feeding mainly refers to a child who breast-fed predominantly but fluid based intakes such as plain water, sugar and salt solution, ORS solution, vitamin and minerals are also taken besides breast-milk. Hence, mothers were asked about their children, whether the children were predominantly breast-fed or not. On the other hand, gruel, solid or semi-solid and other food-based feedings are not included; rather taking of these items is considered as starting complementary feeding.

Based on this assumption, in order to determine the proportion of the children who are predominantly breast-fed for at least 4-6 months after birth, children aged four months and above were categorized. Therefore, the over all prevalence of predominant breast-feeding among the selected age groups (n=333) was 62.2%. Mothers who have attended postnatal care have predominantly breast-fed for their children (64.2%) more than those who have not follow-up (59.1%) (Table 6).

Table 6: Frequency distribution of predominant breast-feeding among children aged four and above months of age, by socio-demographic and health service related variables; Jimma, Southwest Ethiopia, 2002.

Predominant breast-feeding (n=333)		
Variables	<u>≥4 months</u> Number (%)	<4 months Number (%)
Age of mothers in years		
15-19	20 (52.6)	18 (47.4)
20-24	83 (66.4)	42 (33.6)
25-29	69 (64.5)	38 (35.5)
30-34	21 (60.0)	14 (40.0)
35 and above	14 (50.0)	14 (50.0)
Sex of child		
Male	106 (61.6)	66 (38.4)
Female	101 (62.7)	60 (37.3)
Relation of mother to head of household		
Wife	190 (63.1)	111 (36.9)
Other than wife	17 (53.1)	15 (46.9)
Religion		
Muslim	76 (60.3)	50 (39.7)
Christian	131 (63.3)	76 (36.7)
Ethnicity		
Oromo	73 (55.7)	58 (44.3)
Amhara	48 (65.8)	25 (34.2)
Dawro	30 (62.5)	18 (37.5)
Guragie	27 (69.2)	12 (30.8)
The rest	29 (69.0)	13 (31.0)
Attended formal school		
Yes	162 (59.8)	109 (40.2)
No	45 (72.6)	17 (27.4)
Marital status		
Married (active)	176 (62.4)	106 (37.6)
Married (not active)	17 (54.8)	14 (45.2)
Single	14 (70.0)	6 (30.0)
Occupation		
Worker	35 (53.8)	30 (46.2)
Not worker	172 (64.2)	96 (35.8)

Average monthly income		
0-100	50 (63.3)	29 (36.7)
101-200	69 (66.3)	35 (33.7)
201-500	50 (59.5)	34 (40.5)
500 and above	29 (56.9)	22 (43.1)
Don't know	9 (60.0)	6 (40.0)
ANC follow-up		
Yes	173 (62.2)	105 (37.8)
No	34 (61.8)	21 (38.2)
PNC Follow-up		
Yes	129 (64.2)	72 (35.8)
No	78 (59.1)	54 (40.9)
Health education (related topics)		
Satisfactory	45 (63.4)	26 (36.6)
Unsatisfactory	162 (61.8)	100 (38.2)
Place of birth of the index child		
Health facilities	132 (60.3)	87 (39.7)
Outside health facilities	75 (65.8)	39 (34.2)
Sum total	207 (62.2)	126 (37.8)

- **Exclusive breast-feeding**

Exclusive unlike predominant breast-feeding refers to a child who takes nothing except breast-milk alone for a given period of time, usually for the first 4-6 months after birth. Therefore, mothers were asked about their children whether they were exclusively breast-fed or not for the stated period. The proportion of exclusive breast-feeding among children aged four and above months (n=333) was 6.9%. That is, around 7% of the children aged ≥ 4 months have continued exclusively breast-feeding (Table 7).

Table 7: Frequency distribution of exclusive breast-feeding among children aged four and above months of age, by socio-demographic and health service related variables; Jimma, Southwest Ethiopia, 2002.

Exclusive breast-feeding (n=333)		
Variables	≥ 4 months Number (%)	<4 months Number (%)
Age of mothers in years		
15-19	3 (7.9)	35 (92.1)
20-24	6 (4.8)	119 (95.2)
25-29	10 (9.3)	97 (90.7)
30-34	2 (5.7)	33 (94.3)
35 and above	2 (7.1)	26 (92.8)
Sex of child		
Male	6 (3.5)	166 (96.5)
Female	17 (10.6)	144 (89.4)
Relation of mother to head of household		
Wife	21 (7.0)	280 (93.0)
Other than wife	2 (6.2)	30 (93.8)
Religion		
Muslim	7 (5.6)	119 (94.4)
Christian	16 (7.7)	191 (92.3)

Ethnicity		
Oromo	6 (4.6)	125 (95.4)
Amhara	8 (11.0)	65 (89.0)
Dawro	6 (12.5)	42 (87.5)
Guragie	1 (2.6)	38 (97.4)
The rest	2 (4.8)	40 (95.2)
Attended formal school		
Yes	17 (6.3)	254 (93.7)
No	6 (9.7)	56 (90.3)
Marital status		
Married (active)	18 (6.4)	264 (93.6)
Married (not active)	3 (9.7)	28 (90.3)
Single	2 (10.0)	18 (90.0)
Occupation		
Worker	4 (6.2)	61 (93.8)
Not worker	19 (7.1)	249 (92.9)
Average monthly income		
0-100	8 (10.1)	71 (89.9)
101-200	6 (5.8))	98 (94.2)
201-500	7 (8.3)	77 (91.7)
500 and above	1 (2.0)	50 (98.0)
Don't know	1 (6.7)	14 (93.3)
ANC follow-up		
Yes	18 (6.5)	260 (93.5)
No	5 (9.1)	50 (90.9)
PNC Follow-up		
Yes	12 (6.0)	189 (94.0)
No	11 (8.3)	121 (91.7)
Health education (related topics)		
Satisfactory	6 (8.5)	65 (91.5)
Unsatisfactory	17 (6.5)	245 (93.5)
Place of birth of the index child		
Health facilities	12 (5.5)	207 (94.5)
Outside health facilities	11 (9.6)	103 (90.4)
Sum total	23 (6.9)	310 (93.1)

- **General practices of breast-feeding**

General practices such as breast-feeding styles (feeding on demand or program), exclusive breast-feeding, frequency or intensity of breast-feeding, and related practices were included here. In order to explain the state of the general practices about breast-feeding all the relevant individual breast-feeding practices were considered as hundred percent, then an optimal practices that have been identified were scored in respect to the number of participants. Finally, those optimal practices that have been practiced by the mothers for 75% and above of them, were labeled as “good practice”, while for those less than 75%, labeled as “poor practice”.

Based on this assumption, around 28% of the mothers have good practices about breast-feeding. Among Muslim mothers, 45 (31.9%) have good practices as compared to Christian mothers, of whom 50 (25.5%) have good practices of breast-feeding. From the total Oromo ethnic group mothers, 42 (29.4%) showed good practice when compared to mothers from the minor ethnic groups, out of whom 9 (19.1%) have practiced properly. There is also a substantial difference in proportion between marital statuses; among mothers who are married and currently active, 81 (28.8%) showed good practice, while out of those single mothers, 4 (16.7%) have good practice of breast-feeding (Table 8).

After an adjustment has made, using logistic regression model, for covariates, most of the socio-demographic and health service related variables showed no significant association with the outcome variable. However, postnatal follow-up established significant association with

the actual general practice of breast-feeding ($p < 0.010$). Mothers, who have not followed postnatal care within 45 days after birth have better practices [adjusted OR=0.50 (0.29,0.85)] than those who have follow-up after birth (Table 8). The possible explanation for this finding could be because of the maternal educational background, which let them to follow-up the care. On the other hand, most of the educated mothers participate in working conditions that let them to pass their time out side their home, which in return creates difficulties in a day-to-day care of their children.

Table 8: General breast-feeding practices among mothers of children aged less than two years, by selected sociodemographic and health service related variables; Jimma, Southwest Ethiopia, 2002.

General breast-feeding practices (n=337)				
Variables	Good Number (%)	poor Number (%)	Crude OR (CI)	Adju OR (CI)
Age of mother in years				
15-19	14 (33.3)	28 (66.7)	1.00	1.00
20-24	35 (26.5)	97 (73.5)	0.72 (0.32,1.63)	0.63 (0.28,1.42)
25-29	28 (28.9)	69 (71.1)	0.81 (0.35,1.90)	0.79 (0.34,1.85)
30-34	9 (24.3)	28 (75.7)	0.64 (0.21,1.92)	0.52 (0.18,1.50)
≥35	9 (31.0)	20 (69.0)	0.90 (0.29,2.79)	0.66 (0.22,1.9)
Relation of mother to head of house- hold				
Wife	86 (28.6)	215 (71.4)	1.20 (0.51,2.88)	1.05 (0.26,3.69)
Other than wife	9 (25.0)	27 (75.0)	1.00	1.00
Religion				
Muslim	45 (31.9)	96 (68.1)	1.37 (0.83,2.27)	1.70 (0.86,3.39)
Christian	50 (25.5)	146 (74.5)	1.00	1.00
Ethnicity				
Oromo	42 (29.4)	101 (70.6)	1.76 (0.74,4.29)	1.05 (0.39,2.81)
Amhara	17 (29.8)	40 (70.2)	1.79 (0.65,5.00)	1.69 (0.65,4.37)
Dawro	19 (36.5)	33 (63.5)	2.43 (0.89,6.77)	2.24 (0.87,5.82)
Guragie	8 (21.1)	30 (78.9)	1.13 (0.34,3.69)	0.79 (0.25,2.50)
The rest	9 (19.1)	38 (80.9)	1.00	1.00
Attended formal school				
Yes	74 (28.0)	190 (72.0)	0.96 (0.52,1.78)	1.19 (0.62,2.27)
No	21 (28.8)	52 (71.2)	1.00	1.00
Marital status				
Married (active)	81 (28.8)	200 (71.2)	2.03 (0.65,8.38)	2.45 (0.56,10.82)
Married (not active)	10 (31.2)	22 (68.8)	2.27 (0.54,11.38)	2.25 (0.56,9.11)
Single	4 (16.7)	20 (83.3)	1.00	1.00
Occupation				
Worker	18 (29.0)	44 (71.0)	1.05 (0.55,2.01)	1.10 (0.56,2.15)
Not worker	77 (28.0)	198 (72.0)	1.00	1.00

ANC follow-up					
Yes	72 (27.1)	194 (72.9)	0.77 (0.42,1.42)	0.89 (0.46,1.71)	
No	23 (32.4)	48 (67.6)	1.00	1.00	
PNC Follow-up					
Yes	45 (23.7)	145 (76.3)	0.60 (0.36,1.00)	0.50 (0.29,0.85)	
No	50 (34.0)	97 (66.0)	1.00	1.00	
Health education (related topics)					
Satisfactory	16 (28.1)	41 (71.9)	0.99 (0.50,1.95)	1.08 (0.55,2.12)	
Unsatisfactory	79 (28.2)	201 (71.8)	1.00	1.00	
Place of birth of the index child					
Health facilities	51 (24.9)	154 (75.1)	0.66 (0.40,1.10)	0.69 (0.39,1.22)	
Outside health facilities	44 (33.3)	88 (66.7)	1.00	1.00	
Sum total	95 (28.2)	242 (71.8)			

- **Knowledge about the benefits of breast-feeding**

Mothers were assessed whether they have adequate knowledge about the benefits of breast-feeding or not. Benefits of breast-feeding such as contraceptive effect, nutritious, protective (particularly for acute diarrhea) and related importance were mentioned in different ways to ascertain the level of mothers' knowledge.

In order to examine the knowledge of mothers about the benefits of breast-feeding, all the relevant variables were selected and considered as hundred percent, then positive responses were scored in respect to the number of participants. Finally, those positive responses for 75% and above of the relevant variables regarding to the benefits of breast-feeding, were labeled as "satisfactory knowledge", while for those less than 75%, labeled as "unsatisfactory knowledge". Based on this assumption, 277 (67.2%) of the mothers have satisfactory knowledge about the benefits of breast-feeding (Table 9).

After scoring the responses, knowledge about benefits of breast-feeding was tested in order to determine whether it is associated with the background characteristics of mothers or not. Hence, mothers who are housewives in relation to the head of the household have 3.2 times more chance of having satisfactory knowledge about the benefits of breast-feeding [adjusted OR=3.23 (1.12, 9.28)], as compared to those other than housewives. Furthermore, Antenatal follow-up showed significant association with maternal knowledge ($p<0.015$). Those who have attended antenatal follow up have 2.1 times more chance of having satisfactory

knowledge (Adjusted OR= 2.12 (1.16, 3.89) as compared to those who have not follow-up (Table 9).

On the other hand, mothers who have attended formal education have 2.2 times more chance of having satisfactory knowledge ($P < 0.008$), as compared to those who have not attended formal education. Likewise, experiences of attending health education among mothers showed significant association with the knowledge about the benefits of breast-feeding ($p < 0.013$). Mothers who have “satisfactory” health education have 2.3 times more chance of having satisfactory knowledge about the benefits of breast-feeding [adjusted OR=2.28 (1.19,4.35)], as compared to those who have “unsatisfactory” health education (Table 9).

Table 9: knowledge about the benefits of breast-feeding among mothers of children aged less than two years, by socio-demographic and health service related characteristics; Jimma, Southwest Ethiopia, 2002.

Knowledge about benefits of breast-feeding (n=412)				
Variables	Satisfactory Numbers (%)	Unsatisfactory Number (%)	Crude OR (CI)	Adju OR (CI)
Age of mothers in years				
15-19	30 (61.2)	19 (38.8)	1.00	1.00
20-24	101 (66.0)	52 (34.0)	1.23 (0.60,2.52)	0.99 (0.47,2.09)
25-29	90 (70.9)	37 (29.1)	1.54 (0.73,3.25)	1.10 (0.51,2.39)
30-34	29 (64.4)	16 (35.6)	1.15 (0.46,2.89)	0.92 (0.36,2.35)
≥ 35	27 (71.1)	11 (28.9)	1.15 (0.57,4.26)	1.27 (0.46,3.47)
Relation of mother to head of household				
Wife	257 (69.5)	113 (30.5)	2.50 (1.25,5.00)	3.23 (1.12,9.28)
Other than wife	20 (47.6)	22 (52.4)	1.00	1.00
Religion				
Muslim	97 (60.6)	63 (39.4)	0.62 (0.40,0.96)	0.83 (0.46,1.51)
Christian	180 (71.4)	72 (28.6)	1.00	1.00
Ethnicity				
Oromo	108 (62.8)	64 (37.2)	0.80 (0.39,1.61)	0.89 (0.39,2.04)
Amhara	63 (75.9)	20 (24.1)	1.49 (0.65,3.43)	1.13 (0.49,2.58)
Dawro	41 (70.7)	17 (29.3)	1.14 (0.47,2.76)	1.39 (0.58,3.34)
Guragie	29 (63.0)	17 (37.0)	0.81 (0.32,2.01)	0.87 (0.34,2.21)
The rest	36 (67.9)	17 (32.1)	1.00	1.00
Attended formal education				
Yes	239 (71.6)	95 (28.4)	2.65 (1.55,4.52)	2.17 (1.23,3.84)
No	38 (48.7)	40 (51.3)	1.00	1.00
Marital status				
Married (active)	239 (68.5)	110 (31.5)	1.59 (0.66,3.82)	0.53 (0.16,1.76)
Married (not active)	23 (62.2)	14 (37.8)	1.20 (0.38,3.79)	0.72 (0.23,2.30)
Single	15 (57.7)	11 (42.3)	1.00	1.00
Occupation				
Worker	59 (71.1)	24 (28.9)	1.25 (0.72,2.19)	1.11 (0.61,1.20)
Not worker	218 (66.3)	111 (33.7)	1.00	1.00

ANC follow-up				
Yes	242 (71.6)	96 (28.4)	2.81 (1.63,4.85)	2.12 (1.16,3.89)
No	35 (47.3)	39 (52.7)	1.00	1.00
PNC Follow-up				
Yes	166 (70.6)	69 (29.4)	1.43 (0.93,2.21)	1.11 (0.70,1.75)
No	11 (62.7)	66 (37.3)	1.00	1.00
Health education (related topics)				
Satisfactory	66 (81.5)	15 (18.5)	2.50 (1.32,4.80)	2.28 (1.19,4.35)
Unsatisfactory	211 (63.7)	120 (36.3)	1.00	1.00
Place of birth of the index child				
Health facilities	194 (72.1)	75 (27.9)	1.87 (1.19,2.93)	1.45 (0.87,2.41)
Outside health facilities	83 (58.0)	60 (42.0)	1.00	1.00
Sum total	277 (67.2)	135 (32.8)		

- **Complementary feeding**

Around 83.3% of the children (n=341) have started complementary feeding in the first 0-4 months after birth, while 16.7% have started after 4 months of age. Among the mothers aged 15-19 years, 5 (12.5%) started timely complementary feeding, that is 5-9 months after birth. While, 8 (20.5%) of mothers aged 35 years and above started timely complementary feeding for their children. Out of the male children, 33 (18.3%) were put on timely complementary-feeding as compared to females (14.9%).

- **Duration of Breast-feeding**

Mothers were asked whether they continue breast-feeding for the optimal duration, for at least one year or not. Out of the total children aged ≥ 12 months (n=183) about 141 (77.0%) have been fed breast-milk for one year and above. While, 42 (23.0%) were breast-fed only for less than one year. On the other hand, 71 (74.7%) of the male children continued on breast-feeding for one year and above, but 70 (79.5%) of females continued on breast-feeding for the same time. Hence, there is slight sex difference in proportion of the duration of breast-feeding (table 10). The mean duration ($\pm$ standard deviation) of breast-feeding among all age groups is 8.76 (6.39) months.

Table 10: Duration of breast-feeding among children aged one and above year but less than two years of age, by sociodemographic and health service related variables; Jimma, Southwest Ethiopia, 2002.

Duration of breast-feeding (n=183)		
Variables	<u>≥12 months</u> Number (%)	<12 months Number (%)
Age of mothers in years		
15-19	13 (92.9)	1 (7.1)
20-24	64 (83.1)	13 (16.9)
25-29	43 (70.5)	18 (29.5)
30-34	13 (72.2)	5 (27.8)
35 and above	8 (61.5)	5 (38.5)
Sex of child		
Male	71 (74.7)	24 (25.3)
Female	70 (79.5)	18 (20.5)
Relation of mother to head of household		
Wife	125 (75.8)	40 (24.2)
Other than wife	16 (88.9)	2 (11.1)
Religion		
Muslim	66 (86.8)	10 (13.2)
Christian	75 (70.1)	32 (29.9)
Ethnicity		
Oromo	65 (77.4)	19 (22.6)
Amhara	25 (67.6)	12 (32.4)
Dawro	17 (85.0)	3 (15.0)
Guragie	19 (90.5)	2 (9.5)
The rest	15 (71.4)	6 (28.6)
Attended formal education		
Yes	110 (72.8)	41 (27.2)
No	31 (96.9)	1 (3.1)
Marital status		
Married (active)	116 (74.4)	40 (25.6)
Married (not active)	15 (93.8)	1 (6.2)
Single	10 (90.9)	1 (9.1)

Occupation		
Worker	25 (73.5)	9 (26.5)
Not worker	116 (77.9)	33 (22.1)
Average monthly income		
0-100	39 (86.7)	6 (13.3)
101-200	47 (87.0)	7 (13.0)
201-500	35 (72.9)	13 (27.1)
500 and above	16 (55.2)	13 (44.8)
Don't know	4 (57.1)	3 (42.9)
ANC follow-up		
Yes	115 (73.7)	41 (26.3)
No	26 (96.3)	1 (3.7)
PNC Follow-up		
Yes	86 (77.5)	25 (22.5)
No	55 (76.4)	17 (23.6)
Health education (related topics)		
Satisfactory	31 (68.9)	14 (31.1)
Unsatisfactory	110 (79.7)	28 (20.3)
Place of birth of the index child		
Health facilities	88 (70.4)	37 (29.6)
Outside health facilities	53 (91.4)	5 (8.6)
Sum total	141 (77.0)	42 (23.0)

4. Occurrence of Acute Diarrhea

Mothers of children aged less than two years were asked about the presence of acute diarrhea in the two weeks preceding the date of data collection. Most of the cases were found with diarrhea at the time of the survey, and few of them cured of the disease some days before the date of survey. The two weeks prevalence of acute diarrhea was 39.3%. The occurrence of acute diarrhea is significantly associated with sociodemographic characteristics such as maternal age, child age and sex of the child.

According to the findings of this study, the risk of getting acute diarrhea increases from six months onwards and slightly decreases when the children age approach towards the second year. The possible explanation for the findings could be, the protection level decreases as age increases from birth onwards, and improved when the child age approaches to the age of two years. For example, children aged 6-11 months have 2.7 times more risk of having acute diarrhea [(Adjusted OR=2.66 (1.23,5.72)] as compared to the young ages; and those 12-17 months have 5.5 times more risk of having acute diarrhea (Table 11).

Maternal age 20-24 years [Adjusted OR=0.38 (0.16,0.89)] and 25-29 years [Adjusted OR=0.38 (0.15,0.94)] showed significant association with the occurrence of acute diarrhea. Children from mothers who are in the middle age tend to be protected from the risk of acquiring acute diarrhea as compared to those from mothers in the early and late ages. Moreover, female children are protected from the risk of acquiring acute diarrhea [(adjusted OR=0.57 (0.34,0.96)] as compared to the males (Table 11).

Out the children from mothers aged 15-19 years, 24 (49%) have acquired acute diarrhea, while 11 (28.9%) of children from mothers aged 35 years and above developed the disease. Among the children from Muslim mothers, 41.9% developed diarrhea, as compared to those from Christian mothers, of whom 95 (37.7%) developed acute diarrhea. On the other hand, out of the children from the minor ethnic group mothers, 26 (49.1%) acquired acute diarrhea, as compared with those from Oromo ethnic mothers, 66 (38.4%) have developed the disease (Table 11).

Table 11: Occurrence of acute diarrhea in the two weeks preceding the date of data collection among children aged less than two years, by selected socio-demographic variables; Jimma, Southwest Ethiopia, 2002.

Occurrence of acute diarrhea (n=412)				
Variables	Yes Numbers (%)	No Number (%)	Crude OR (CI)	Adj OR (CI)
Age of mothers in years				
15-19	24 (49.0)	25 (51.0)	1.00	1.00
20-24	57 (37.3)	96 (62.7)	0.62 (0.31,1.25)	0.38 (0.16,0.89)
25-29	48 (37.8)	79 (62.2)	0.63 (0.31,1.30)	0.38 (0.15,0.94)
30-34	22 (48.9)	23 (51.1)	1.00 (0.41,2.42)	0.73 (0.25,2.15)
35 and above	11 (28.9)	27 (71.1)	0.42 (0.16,1.14)	0.54 (0.18,1.65)
Age of children in months				
0-5	27 (22.9)	91 (77.1)	1.00	1.00
6-11	49 (44.1)	62 (55.9)	2.66 (1.45,4.91)	2.66 (1.23,5.72)
12-17	51 (50.5)	50 (49.5)	3.44 (1.85,6.41)	5.49(2.46,12.25)
18-23	35 (42.7)	47 (57.3)	2.51 (1.30,4.86)	4.71(1.85,11.97)
Sex of child				
Male	92 (43.6)	119 (56.4)	1.00	1.00
Female	70 (34.8)	131 (65.2)	0.69 (0.46,1.05)	0.57 (0.34,0.96)
Relation of mother to head of household				
Wife	146 (39.5)	224 (60.5)	1.00	1.00
Other than wife	16 (38.1)	26 (61.9)	0.94 (0.47,1.90)	1.21 (0.35,4.15)
Religion				
Muslim	67 (41.9)	93 (58.1)	1.00	1.00
Christian	95 (37.7)	157 (62.3)	0.84 (0.55,1.28)	0.69 (0.34,1.37)
Ethnicity				
Oromo	66 (38.4)	106 (61.6)	1.00	1.00
Amhara	31 (37.3)	52 (62.7)	0.96 (0.54,1.70)	1.49 (0.64,3.47)
Dawro	25 (43.1)	33 (56.9)	1.22 (0.64,2.32)	1.33 (0.53,3.35)
Gurage	14 (30.4)	32 (69.6)	0.70 (0.33,1.49)	0.87 (0.36,2.11)
The rest	26 (49.1)	27 (50.9)	1.55 (0.80,3.01)	2.46 (0.96,6.27)
Attended formal education				
Yes	133 (39.8)	201 (60.2)	1.00	1.00
No	29 (37.2)	49 (62.8)	0.89 (0.52,1.53)	0.89 (0.45,1.74)
Marital status				
Married (active)	136 (39.0)	213 (61.0)	1.00	1.00
Married (not active)	17 (45.9)	20 (54.1)	1.33 (0.64,2.77)	1.01 (0.36,2.85)
Single	9 (34.6)	17 (65.4)	0.83 (0.33,2.04)	0.51 (0.13,1.96)
Occupation				
Worker	30 (36.1)	53 (63.9)	1.00	1.00
Not worker	132 (40.1)	197 (59.9)	1.18 (0.70,2.01)	0.73 (0.37,1.41)

The state of not attending a postnatal care [(Adjusted OR=0.47 (0.27,0.81)], place of birth outside the health facilities of the youngest child [(Adjusted OR=2.12 (1.20,3.75)], unsatisfactory knowledge about the duration and exclusive breast-feeding [(Adjusted OR=0.29 (0.12,0.73)], were significantly associated with the occurrence of acute diarrhea (Table 12).

Children from mothers who have post-natal care follow-up are more likely to have the disease as compared to those from mothers who have not follow-up ($P<0.006$). On the other hand, those children who had born outside the health facilities have 2.1 times more risk of having the disease as compared to those born inside the health institutions ($P<0.010$). Moreover, children from mothers who have unsatisfactory knowledge about exclusivity and duration of breast-feeding are less likely of acquiring acute diarrhea than those from mothers who have satisfactory knowledge ($p<0.008$) (Table 12). The possible explanation for these findings could be because of the maternal educational background and participation in working conditions, which let them passed more time outside their home that creates difficulties in a day-to-day caring of their children.

Among the children from mothers who have not attended health education about breast-feeding and related topics, 126 (38.1 %) developed diarrhea, when compared to those from mothers who have attended health education, of whom 44.4% have had diarrhea. Furthermore, among children who have breast-fed for < 6 times Per day, 82 (42.5%) have developed diarrhea as compared to those children who have breast-fed for ≥ 6 times per day, of whom 39.6% have developed the disease (Table 12).

Hygienic practice in this case includes practices of hand washing, child stool disposal and related practices. After scoring have made for the positive responses for those variables, those responses lying on the third quartile and above, that is 75% and above of the selected variables assumed to be satisfied for a good hygienic practice were properly practiced by the participants; were labeled as " good practice ", while for those scores less than third quartile, were labeled as " poor practice". Based on this assumption, out of the children from mothers who have poor practice, 90 (38.0%) have experienced episodes of diarrhea (Table 12).

Table 12: Occurrence of acute diarrhea in the last two weeks preceding the date of data collection among children aged less than two years, by selected breast-feeding and health service related variables; Jimma, southwest Ethiopia, 2002.

Variables	Occurrence of acute diarrhea (n=412)		Crude OR (CI)	Adj OR (CI)
	Yes Number (%)	No Number (%)		
ANC follow-up				
Yes	134 (39.6)	204 (60.4)	1.00	1.00
No	28 (37.8)	46 (62.2)	0.93 (0.53,1.60)	0.87 (0.44,1.73)
P NC follow-up				
Yes	111 (47.2)	124 (52.8)	1.00	1.00
No	51 (28.8)	126 (71.2)	0.45 (0.29,0.70)	0.47 (0.27,0.81)
Health education (related topics)				
Satisfactory	36 (44.4)	45 (55.6)	1.00	1.00
Unsatisfactory	126 (38.1)	205 (61.9)	0.77 (0.46,1.29)	1.06 (0.54,2.10)
Place of birth Of the index child				
Health facilities	93 (34.6)	176 (65.4)	1.00	1.00
Outside health facilities	69 (48.3)	74 (51.7)	1.76 (1.14,2.73)	2.12 (1.20,3.75)
Child immunization				
Yes	161 (40.1)	240 (59.9)	1.00	1.00
No	1 (9.1)	10 (90.9)	0.15 (0.00,1.07)	0.17 (0.02,1.80)
Initiation of breast-feeding (n=407)				
Within 24 hours	132 (38.9)	207 (61.1)	1.00	1.00
After 24 hours	29 (42.6)	39 (57.4)	1.17 (0.67,2.04)	1.81 (0.88,3.72)
Frequency of breast-feeding (n=337)				
≥6 times per day	57 (39.6)	87 (60.4)	1.00	1.00
<6 times per day	82 (42.5)	111 (57.5)	1.13 (0.71,1.79)	1.22 (0.72,2.06)
Exclusive breast-feeding (n=333)				
≥4 months	7 (30.4)	16 (69.9)	1.00	1.00
>4 months	136 (43.9)	174 (56.1)	1.77 (0.66,4.89)	1.14 (0.63,2.04)
Knowledge about duration and exclusive breast-feeding				
Satisfactory	20 (62.5)	12 (37.5)	1.00	1.00
Unsatisfactory	142 (37.4)	238 (62.6)	0.36 (0.16,0.80)	0.29 (0.12,0.73)
Hygienic practice				
Good	72 (41.1)	103 (58.9)	1.00	1.00
Poor	90 (38.0)	147 (62.0)	0.88 (0.58,1.33)	1.35 (0.75,2.44)
Knowledge about the benefits of breast-feeding				
Satisfactory	47 (34.8)	88 (65.2)	1.00	1.00
Unsatisfactory	115 (41.5)	162 (58.5)	1.33 (0.85,2.08)	1.54 (0.87,2.72)

- **Breast feeding during the onset of diarrhea**

Respondents were asked about their trends of breast-feeding during the onset of acute diarrhea. Out of the mothers who breast-fed for their children during the onset of acute diarrhea, 82 (59.0%) continued breast-feeding, and 57 (41.0%) restricted breast-feeding for their children during the onset of acute diarrhea (Table 13). Restriction in this case is explained as when the child takes nothing and decreases from the usual breast-feeding.

This trend showed substantial differences in proportion among different maternal characteristics. For example, 65.0% of mothers aged 15-19 years restricted breast-feeding for their children during the onset of acute diarrhea, while 20% of mothers aged 35 and above years restricted breast-feeding in the same time. On the other hand, 54.2% of mothers who are Dawro in ethnicity restricted breast-feeding to their children during the onset of diarrhea as compared to the Oromo's, of whom 19 (33.9%) restricted breast-feeding. Among the mothers who are housewives, 53 (42.1%) restricted breast-feeding as compared to those who are not housewives, of whom nearly 31% restricted breast-feeding for their children in the same time (Table 13).

Out of the total married mothers who are actively coupled with their husbands, 46 (39.7%) restricted breast-feeding as compared to those who are not married, of whom nearly 63% restricted breast-feeding. Around 38% of males, and 44% of females were restricted from breast-feeding during the onset of diarrhea, which showed slight differences in proportion among the sexes (Table 13). Moreover, children from mothers who are workers experienced

restriction of breast-feeding (34.6%), while 48 (42.5%) of those from mothers who are not workers experienced restriction of breast-feeding. Among mothers who have attended antenatal care, 46 (41.4%) restricted breast-feeding, as compare to mothers who haven not attended antenatal care (Table 13).

Table 13: Breast-feeding practice during the onset of acute diarrhea among children aged less than two years, by selected sociodemographic and health service related variables; Jimma, Southwest Ethiopia, 2002.

Breast-feeding practice (n=139)		
Variables	Restriction Number (%)	Breast-milk allowed Number (%)
Age of mothers in years		
15-19	13 (65.0)	7 (35.0)
20-24	20 (37.7)	33 (62.3)
25-29	16 (42.1)	22 (57.9)
30-34	6 (33.3)	12 (66.7)
35 and above	2 (20.0)	8 (80.0)
Sex of child		
Male	29 (38.2)	47 (61.8)
Female	28 (44.4)	35 (55.6)
Relation of mother to head of household		
Wife	53 (42.1)	73 (57.9)
Other than wife	4 (30.8)	9 (69.2)
Religion		
Muslim	22 (36.7)	38 (63.3)
Christian	35 (44.3)	44 (55.7)
Ethnicity		
Oromo	19 (33.9)	37 (66.1)
Amhara	11 (47.8)	12 (52.2)
Dawirro	13 (54.2)	11 (45.8)
Guragie	4 (30.8)	9 (69.2)
The rest	10 (43.5)	13 (56.5)

Attended formal school		
Yes	47 (42.3)	64 (57.7)
No	10 (35.7)	18 (64.3)
Marital status		
Married (active)	46 (39.7)	70 (60.3)
Married (not active)	6 (40.0)	9 (60.0)
Single	5 (62.5)	3 (37.5)
Occupation		
Worker	9 (34.6)	17 (65.4)
Not worker	48 (42.5)	65 (57.5)
Average monthly income		
0-100	19 (50.0)	19 (50.0)
101-200	11 (31.4)	24 (68.6)
201-500	16 (39.0)	25 (61.0)
500 and above	8 (44.4)	10 (55.6)
Don't know	3 (42.9)	4 (57.1)
ANC follow-up		
Yes	46 (41.4)	65 (58.6)
No	11 (39.3)	17 (60.7)
PNC Follow-up		
Yes	44 (45.8)	52 (54.2)
No	13 (30.2)	30 (69.8)
Health education (related topics)		
Satisfactory	11 (40.7)	16 (59.3)
Unsatisfactory	46 (41.1)	66 (58.9)
Place of birth of the index child		
Health facilities	30 (41.1)	43 (58.9)
Outside health facilities	27 (40.9)	39 (59.1)
Sum total	57 (41.0%)	82 (59.0%)

- **Intake practice of substances during the onset of Diarrhea**

Intakes of fluid and food substances were included here, for example, whether mothers have restricted or allowed fluid foods, solid /semi-solid foods, oral rehydration salt and other homemade fluids, were checked by asking them. Among the total mothers, 61 (37.7%) restricted part or all of the substances for their children during the onset of acute diarrhea. To label the intake practice of substances during the time of diarrhea, scoring of responses has been made and those positive responses lying on the third quartile and above were labeled as “good practice”, while for those below it as “poor practice”.

Associations were formulated, after an adjustment using logistic regression was made for covariates. Selected variables such as maternal age, maternal relation to head of the household ($p<0.036$) and marital status ($p<0.045$), were significantly associated with the current intake practice of substances during the onset of acute diarrhea. This trend of practice showed that as maternal age increases from 20 years onwards mothers are less likely of having good practice about the introduction of eating and drinking substances for their children during the onset of acute diarrhea (Table 14).

Mothers who are wives in relation to the head of the household have 26.5 times more chance of having good practice of intake of substance during the onset of diarrhea as compared to those who are not housewives (Table 14). Other variables, even though not significantly associated, they showed differences in proportion with the current practice of mothers. Among mothers who are Oromo in ethnicity, 12 (21.4%) have good practice in this regard,

while out those who are from the minor ethnic groups, 3 (13.0%) have good practice. From the mothers who have attended formal education, 21 (18.9%) have good practice as compared to those who have not attended, of whom 4 (14.3%) have good practice of intake of substance during the onset of acute diarrhea (Table 14).

Furthermore, out of the mothers who have attended antenatal clinic, 21 (18.9%) have good practice as compare to those who haven not attended, of which 4 (14.3%) has good practice. In the same way, out of the mothers who attended postnatal clinic, 21 (21.9%) have good practice, as compared to those mothers who haven not attended, of whom 4 (9.3%) have good practice of intake of substances during the onset of diarrhea (Table 14).

Mothers were also asked about the reasons for not allowed the substances during the onset of diarrhea; 44 (53%) of mothers replied that restriction of eating and drinking substances during the onset of acute diarrhea was in order to overcome diarrhea. While, 39 (47.0%) of them suggested that restriction is done due to other reasons (not to induce vomiting, child sickness and so forth).

Table 14: Intake practice of substances during the onset of acute diarrhea, among mothers of children aged less than two years, by selected sociodemographic and health service related variables; Jimma, Southwest Ethiopia, 2002.

Intake practice during the onset of acute diarrhea (n=139)				
Variables	Good Number (%)	poor Number (%)	Crude OR (CI)	Adju OR (CI)
Age of mothers in years				
15-19	9 (45.0)	11 (55.0)	1.00	1.00
20-24	8 (15.1)	45 (84.9)	0.22 (0.06,0.80)	0.09 (0.02,0.51)
25-29	6 (15.8)	32 (84.2)	0.23 (0.05,0.92)	0.06 (0.01,0.39)
30-34	2 (11.1)	16 (88.9)	0.15 (0.01,0.9)	0.03 (0.003,0.36)
≥35	0 (0.0)	10 (100)	0.00 (0.00,0.76)	0.00 (0.00,1.83)
Sex of child				
Male	14 (18.4)	62 (81.6)	1.07 (0.41,2.78)	1.36 (0.46,4.06)
Female	11 (17.5)	52 (82.5)	1.00	1.00
Relation of mother to head of household				
Wife	23 (18.3)	103 (81.7)	1.23 (0.24,12.13)	26.45 (1.25,560.8)
Other than wife	2 (15.4)	11 (84.6)	1.00	1.00
Religion				
Muslim	13 (21.70)	47 (78.3)	1.54 (0.60,4.01)	1.52 (0.31,7.51)
Christian	12 (15.2)	67 (84.8)	1.00	1.00
Ethnicity				
Oromo	12 (21.4)	44 (78.6)	1.82 (0.42,11.06)	3.49 (0.35,34.90)
Amhara	5 (21.7)	18 (78.3)	1.02 (0.24,3.70)	3.97 (0.50,31.54)
Dawro	2 (8.3)	22 (91.7)	0.33 (0.03,1.72)	1.07 (0.09,11.52)
Guragie	3 (23.1)	10 (76.9)	1.10 (0.17,5.26)	1.41 (0.11,18.73)
The rest	3 (13.0)	20 (87.0)	1.00	1.00
Attended formal education				
Yes	21 (18.9)	90 (81.1)	1.40 (0.41,6.13)	1.38 (0.27,7.07)
No	4 (14.3)	24 (85.7)	1.00	1.00
Marital status				
Married (active)	20 (17.2)	96 (82.8)	0.63 (0.10,6.80)	0.05 (0.003,9.4)
Married (not active)	3 (20.0)	12 (80.0)	0.75 (0.07,11.43)	0.19 (0.01,3.34)
Single	2 (25.0)	6 (75.0)	1.00	1.00

Occupation				
Worker	3 (11.5)	23 (88.5)	0.54 (0.10,2.05)	0.36 (0.05,2.57)
Not worker	22 (19.5)	91 (80.5)	1.00	1.00
Average monthly income				
0-100	6 (15.8)	32 (84.2)	1.00	1.00
101-200	5 (14.3)	30 (85.7)	0.89 (0.19,3.92)	0.74 (0.14,4.02)
201-500	9 (22.0)	32 (78.0)	1.50 (0.42,5.46)	1.21 (0.25,5.90)
500 and above	3 (16.7)	15 (83.3)	1.07 (0.15,5.85)	1.08 (0.15,7.89)
Don't know	2 (28.6))	5 (71.4)	2.13 (0.16,17.23)	1.07 (0.08,14.87)
ANC follow-up				
Yes	21 (18.9)	90 (81.1)	1.40 (0.41,6.13)	1.03 (0.23,4.64)
No	4 (14.3)	24 (85.7)	1.00	1.00
PNC Follow-up				
Yes	21 (21.9)	75 (78.1)	2.73 (0.83,11.63)	2.54 (0.62,10.46)
No	4 (9.3)	39 (90.7)	1.00	1.00
Health education (related topics)				
Satisfactory	4 (14.8)	23 (85.2)	0.75 (0.17,2.56)	0.36 (0.08,1.66)
Unsatisfactory	21 (18.8)	91 (81.3)	1.00	1.00
Place of birth of the index child				
Health facilities	17 (23.3)	56 (76.7)	2.20 (0.81,6.10)	2.40 (0.71,8.15)
Outside health - facilities	8 (12.1)	58 (87.9)	1.00	1.00

VI. DISCUSSION

The overall prevalence of ever breast-feeding in the study subjects was 98.8%, which is comparable with the result from previous study done in Jimma (96.5%) (2), and with the result from the study done in Addis Ababa (99.5%) (9). When compared to the findings from the interview survey done in Benghazi, Libya (90.5%), the finding from this study is higher. Reasons sought for totally not breast-fed (1.2%) for the current study subjects (children) after birth were due to both maternal and child problems. As per the responses from the participants, maternal Problems included breast milk insufficiency, breast nipple problem (sore), caesarian section and inverted nipples.

According to the findings from this study out of the total study subjects who were initiated breast-feeding within 24 hours (83.3%), about 64% have initiated breast-feeding immediately (within one hour after birth). This finding is higher when compared to the findings from the study done in Nigeria to obtain information on prenatal care, knowledge, attitudes and practices relating to breast-feeding. Out of the total mothers (n=800) attending Jos University Teaching Hospital, Nigeria, 439 (55%) started breast-feeding within 24 hours after delivery (7).

Further more, the findings from this study are lower as compared to the findings from the Ethiopian Demographic Health Survey, about infant feeding and maternal nutrition; which showed 90% of children living in the SNNP (Southern Ethiopian National and Nationalities People) region started breast-feeding within 24 hours after birth. In the same study, 50% of

children living in Amhara region started breast-feeding within 24 hours after birth, which is lower than the current study results (4).

Around 62% of the selected children aged four and above months (n=333) have predominantly breast-fed for ≥ 4 months, and about 38% of children in the same age group were predominantly breast-fed for 0-3 months. This finding is higher than the findings from the study, about patterns of feeding infants, done in Addis Ababa, Ethiopia, which showed 26.8% of children aged 0-4 months (n=500) were predominantly breast-fed (11). According to this study more mothers (44%) who are wives in relation to the head of the household breast-fed their children six and above times per day as compared to those who are other than housewives (36%).

In this study, exclusive breast-feeding for the first 4-6 months after birth among the selected children aged four and above months was seen separately from predominant breast-feeding, which was found to be around 7%. This finding is lower when compared to the result from the Demographic Health Survey, about infant-feeding and maternal nutrition, which showed 38.1% of children were exclusively breast-fed for 4-5 months of age (4). Still, the finding from the current study is lower than the result from the study, about promotion of breast-feeding in the community, done abroad in rural community, Nigeria, which revealed a prevalence of 39.8% of exclusive breast-feeding at 4 months after birth (43).

Based on the findings from this study, maternal background characteristics such as antenatal follow-up, attending formal education and attending health education have found to be more

important for the mothers in acquiring knowledge about the benefits of breast-feeding. Mothers who have experienced these characteristics were found to be in favor of getting satisfactory knowledge about the benefits of breast-feeding.

These findings are consistent with the study, about breast-feeding promotion in a diarrhea program, done in rural communities, Nigeria; which showed seven days after the counseling, received individual focus breast-feeding counseling, more than half in the intervention group were found to be well oriented about the benefits of breast-feeding for their children ($p < 0.0001$) as compared to the control groups. Another study about impact of health education on mothers' knowledge of preventive health, done in a slum area of Karachi, Pakistan, showed that mothers in the intervention group were more aware about the advantage of breast-feeding as compared to the non intervention group ($p < 0.05$) (46).

In this study, the overall two weeks prevalence of acute diarrhea among the study subjects was found to be 39.3%, which showed marked difference with the prospective study of acute diarrhea done elsewhere; out of the total children ($n=336$) followed during the study, around 49% were developed diarrhea (45). But the finding from this study is similar with the results from the cross-sectional study done in rural areas in a Western Region of Ethiopia, Gamo-Gofa, which revealed the prevalence of 40% among those partially breast-fed ($n=114$) (21).

Child age has got statistically significant association with the occurrence of acute diarrhea at different levels. Age group 6-11 months [adjusted OR=2.66 (1.23,5.72)], 12-17 months [adjusted OR=5.49 (2.46,12.25)] and 18-23 months [adjusted OR=4.71 (1.85,11.97)],

established significant associations with the occurrence of acute diarrhea. The result showed that as age of child increases from birth onwards, the risk of acquiring acute diarrhea also increases, while as the age approaches towards the second year, the risk become decreases.

It is true that most diarrhea episodes occur during the first two years of life. The incidence is highest in the age group 6-11 months, when weaning often occurs, followed by 12-23 months and it decreases from this age onwards. This pattern reflects the combined effects of declining levels of maternity acquired antibodies, the lack of active immunity in the infants, the introduction of food that may be contaminated with fecal bacteria, and direct contact with human and animal feces when the infants start to crawl. On the other hand, most enteric pathogens stimulate at least partial immunity against repeated infection or illness, which helps to explain the declining incidence of disease in older children and adults.

Health service related factors such as postnatal care and place of delivery for the last child, showed significant associations with the occurrence of acute diarrhea. Children from mothers who haven not attended postnatal follow-up [(adjusted OR=0.47 (0.27,0.81))] are less likely to have the risk of acute diarrhea, as compared to those from mothers who have attended the follow-up.

Moreover, children from mothers who have unsatisfactory knowledge about exclusivity and duration of breast-feeding are less likely of acquiring acute diarrhea than those from mothers who have satisfactory knowledge ($p<0.008$). The possible explanation for these findings could be because of the maternal educational background and participation in working

conditions, which let them passed more time outside their home that creates difficulties in a day-to-day caring of their children.

However, breast-feeding related variables such as exclusive breast-feeding, duration and intensity of breast-feeding showed no significant association with the occurrence of acute diarrhea. Hence, these findings contradict to the findings from other studies. For example, studies about breast-feeding promotion in a diarrheal program, in rural communities, Nigeria, showed marked increases in exclusive breast-feeding prevalence for the intervention, there by diarrhea re-occurrence was less in the intervention group (16). Moreover, a case control study about the type of milk feeding during acute diarrhea and the risk of persistent diarrhea, done in urban area of North India showed that exclusive breast-feeding was associated with an odds ratio of 0.016 (0.002,2.1), which is 16 times lower odds in favor of developing persistence of an episode of diarrhea (14). Also, study done in Guinea-Bissau, three separate estimates of association showed that the cases tended to have started breast-feeding later after birth than the diarrhea free controls (8).

According to the set criteria for intake practice of substances during the onset of acute diarrhea, out of the total mothers (n=139), 25 (18.0%) have good practice, while 114 (82.0%) have poor practice of allowing fluid and food substances for their children. The finding from this study is some what higher than the findings from the study, about home treatment of acute diarrhea, done in Bali, Indonesia, which showed only about 12% of the mothers were able to properly make the intake of homemade solutions, and over two third of the mothers reduced or stopped the intake of bottled milk and solid food during the episode (16). But the

finding from the current study is slightly lower than the result from the study, about knowledge, attitude and practices of mothers regarding diarrhea among children, done in Sudanese rural community, showed that 25% of mothers with child under five years, prepared and used it correctly (16).

- **Strength of the study**

- The study formulates a test of hypothesis to determine whether the status of breast-feeding indicates any association with the occurrence of acute diarrhea.
- In order to test the hypothesis confounders were controlled by adjusting using logistic regression for covariates, hence any association arise during testing the hypothesis is the real influence of the given explanatory variable.

- **Limitation of the study**

- Since this design is a cross sectional descriptive approach, it has a limitation to formulate a causal association, as to how and when the associations are established.
- Target children who have not mothers were not include in the study because mother-child paired samples were taken in order to assess the status of breast-feeding and its association with the occurrence of acute diarrhea.
- The study was focused on subjects residing in particular settings (town settings), hence comparison of groups at different geographical settings was not made.
- In order to obtain more information from the study subjects it was good if a qualitative data collection approach were considered besides the quantitative method of data collection.

VII. CONCLUSION

This study confirmed that despite the rapid demographic shifts, most of the maternal practices about breast-feeding except the practice of exclusive breast-feeding were found to be optimal. However, it can be concluded that mothers' interacting with certain social, cultural, and economic variables, are important factors influencing their child feeding decisions.

According to this study, the general practice of breast-feeding among mothers who participate in the study is influenced by the state of postnatal care. Moreover, the knowledge of mothers about the benefits of breast-feeding is dependent on the variables such as maternal relations to the head of the household, attending of formal education, antenatal follow-up, and attending of health education about breast-feeding and related topics. The state of being housewife as a relation to the head of the household was found to be more beneficial to have satisfactory knowledge about the benefits of breast-feeding. On the other hand, mothers who have attended antenatal clinic and health education about breast-feeding, were found to be more likely of having satisfactory knowledge about the benefits of breast-feeding.

In the study area, mothers, irrespective of their sociodemographic differences, were tending towards predominant breast-feeding. Therefore, the actual trend of exclusive breast-feeding is diminishing, that is the majority of mothers have practiced early introduction of fluids such as plain water, salt and sugar solutions and related fluid based foods for their children.

The findings of the this study revealed that housewives practiced an optimal breast-feeding as compared to those mothers who are forced to different outside home activities. Marital status, on the other hand, has shown an influence in the actual practice of breast-feeding. Mothers who are married and actively bonded with their husbands are more likely to have good practice and knowledge about breast-feeding.

Furthermore, the practice of allowing fluid and food substances during the onset of acute diarrhea depends on some selected maternal characteristics such as maternal age, maternal relation to the head of the household, and the marital status of mothers. According the set criteria, majority of the mothers have poor practice of allowing eating and drinking substances for their children during the onset of acute diarrhea.

VII. RECOMMENDATIONS

Based on the current study findings the following recommendations are suggested:

1. There is a need for multi-sectoral policies that address obstacles to breast-feeding among women in the paid labor force in the locality as well as national wide.
2. Family planning programs should be focused on breast-feeding type of practices used, especially where there are no contraceptive alternatives.
3. Further analytic study in the field is proposed in order to determine the magnitude of the problem and identify the risk factors associated with the condition.
4. It is recommended that exclusive breast-feeding which tends to diminish be promoted as one important intervention of the control of diarrheal diseases.

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QUESTIONNAIRE (ENGLISH VERSION)

INTRODUCTION

▪ THE OBJECTIVE OF THE STUDY & CONFIDENTIALITY

Introduce your name (name of interviewer) -----, then tell the respondent that you are interviewing people there in Jimma, ----- kebele. Explain about the objective of the study and confidentiality procedures as follows:

By doing this study, we aimed to:

- Find out what mothers in Jimma town think about breast-feeding.
- Find out how many mothers breast-feed their children, and for how long?
- Described whether these issues relate to episodes of acute diarrhea among the children.

To do these, we need mothers of young children (less than two years old) to participate.

All the information you give us will be kept confidentially, and will only be made public in anonym zed form (without your name appearing anywhere)

▪ CONSENT AND IDENTIFICATION

Name of the respondent_____

Address: Keftegna_____Kebele_____ House no _____

Relation to head of house hold_____

- **Please make an ‘X’ mark to show the respondent’s commitment to participate in the study questions:**

1. I have understood the aims of the study and confidentiality procedures and

freely consent to participate_____ []

2. I have understood the aims of the study and the confidentiality procedures but I am not willing to participate_____ []

Signature-----

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

GENERAL INSTRUCTIONS (asking questions and recording answers)

All questions in this paper are based upon maternal recall. It is very important that you ask each question exactly as it is written on the questionnaires. In addition to the questions, there are statements that appear in all bolded capital letters, indicating that they are interviewer instructions and should not be read aloud to the mother.

Most questions have pre-coded responses. It is important that you do not read these alternatives/choices aloud to the mother. When you ask a question, you should listen to the mother's response/answer, and then circle the code next to the category that best matches her answer/response.

▪ SCREENING

1. Is there a child younger than two years of age in this household? (If no, go to the next household)
2. Is the child's mother here? (If no, go to the next household)
3. May I talk to her? (If no, ask the next question)
4. May I come back at another time? (Take appointment)

▪ **INTERVIEWER'S VISIT**

Characteristics	Codes
Name of interviewer-----	Date-- days
Date of visit-----	Month
Result: 1 = completed	Year
2 = no respondent at home	Result -----
3 = postponed	
4 = refused	
9 = other (specify)-----	

SECTION-1: RESPONDENT'S BACKGROUND INFORMATION

▪ **IDENTIFICATION**

S. No	Characteristics	Code category
001	Keftegn.....	Keftegn -----
002	Kebele.....	Kebele -----
003	Household number.....	Household
004	Record number.....	number-----
		Record number.....

005	Name of mother.....	
006	Age of mother (in years).....	Age of mother (in years) ----
007	Age of child (in months).....	Age of child (in months) ----
008	Sex of child (1= male, 2= female).....	Sex of child ----- ☐
009	Relation (mother) to head of the household: 1 = wife (one only) 2 = wife (one among the several) 3 = daughter 4 = house (maid) servant 9 = other (specify) -----	Relation (mother) to head of the household ----- ☐

▪ **Core questions on background information**

S.No	Questions and filters	Code categories	Skip
101	Now I would like to ask you some questions about your background information. - What is your religion (now)?	Muslim.....1 Orthodox 2 Protestant 3 Catholic 4 Other (specify).....9	
102	What is your ethnicity?	Oromo1 Amara2 Guragie 3 Yem 4 Dawro.....5 Tigrie.....6 Kefficho 7 Other (specify) 9	
103	Have you ever attended formal school?	Yes 1 No 2	→ Q 105

104	What is the highest grade you completed?	Primary level (1-4 grade).....1 Medium level (5-8 grade).....2 Secondary level (9-12 grade).....3 Technical/vocational certificate ..4 University/collage diploma 5 University/collage degree 6 Other (specify) 9	
105	What is your marital status?	Single.....1 Married (active).....2 Divorced.....3 Widowed.....4 Separated.....5 Other (specify).....9	
106	What is your current occupational status?	^π Gov'tal employee.....1 Non-gov'tal employee.... 2 ^ψ Business women.....3 Daily laborer.....4 Student.....5 House wife.....6 House servant.....7 Other (specify)9	
107	What is the average monthly income of the household? * PROBE FOR APPROXIMATE NUMBER	<50 Birr.....1 51-100 Birr.....2 101-200 Birr.....3 201-500 Birr.....4 500+ Birr.....5 Don't know.....7	
108	What is the main source of drinking water for members of your household?	Piped/tap.....1 Open well/spring.....2 Covered well/spring.....3 River/pond.....4 Rain water.....5 Other (specify)9	

^π Government

^ψ merchant or trader

**SECTION-2: CORE QUESTIONS ON THE MATERNITY
EXPERIENCES OF THE YOUNGEST CHILD**

S.No	Questions & filters	Code categories	Skip
201	Now I would like to ask you some questions about your maternity experiences. How many children are born alive?	No. Children born alive.....□□	
202	How many children do you have now?	Number of children.....□□	
203	Have you attended antenatal clinic in any health facility while you were pregnant with the last child?	Yes.....1 No.....2 Don't know.....7	→Q205 →Q205
204	How many times have you attended the antenatal clinic in that specific health facility?	Number of attended antenatal follow-up.....□□ Don't know.....99	
205	Following your last delivery have you attended postnatal clinic in any health facility?	Yes.....1 No.....2 Don't know.....7	
206	Have you ever been informed/advised about breast-feeding while you were pregnant or in the period after delivery of the last child?	Yes.....1 No.....2 Don't know.....7	
207	In addition to breast-feeding the information/advice that has been given was about which of the following? Breast-feeding only? Bottle-feeding? Supplementary feeding? Vaccination? Child spacing? Environmental sanitation? About Other topics?	<u>Yes</u> <u>No</u> <u>DK</u> Breast-feeding only-----1 2 7 Bottle-feeding-----1 2 7 Supplementary feeding----1 2 7 About Other topics-----1 2 7 Vaccination -----1 2 7 Child spacing -----1 2 7 Environ. Sanitation-----1 2 7 Other (specify)-----	

208	Where did you give birth to the last child?	Own home.....1 Gov'tal health facility.....2 Non gov'tal health facility.....3 Private clinic-----4 Other (specify).....9	
-----	---	---	--

209	Who assisted with the delivery of the last child? Any one else? * PROBE FOR THE TYPE OF PERSON & RECORD ALL PERSON ASSISTING.	Health professional.....1 Trained traditional birth attendant..... 2 Untrained traditional birth attendant..... 3 Relatives/friends/neighbors.....4 Other (specify).....9	
210	Have the youngest child ever immunized (at least one) against the six target diseases?	Yes.....1 No.....2 Don't know.....7	→Q301 →Q301
211	Have the child completed (fully immunized) the required vaccines (antigens)?	Yes.....1 No.....2 Don't know.....7	
212	In order to ensure the above information, ask mother politely to provide you the immunization card then complete the following information accordingly.	Including measles the child have completed the six vaccine antigens1 Except measles (defaulter) the child has got the rest vaccine antigens.....2 The child is taking the required vaccine antigens according his age.....3 Since the card is lost it is impossible to ensure the required information..... 4 The immunization card was not Given..... 5 Other specify).....9	

SECTION- 3: BASIC INFORMATION ABOUT BREAST- FEEDING

S.No	Questions & filters	Code categories	Skip
301	Now I would like to ask you some questions about breast-feeding of the last child. Have you ever breast-fed the youngest child?	Yes.....1 No.....2	→Q314
302	How long after birth did you first put the child to the breast? * IF LESS THAN ONE HOUR, RECORD “00”HOURS IF LESS THAN 24 HOURS, RECORD HOURS OTHERWISE, RECORD DAYS	Immediately.....00 Hours..... □□ Days..... □□ Don't know.....99	
303	Within the first three days after delivery, before your milk began flowing regularly, did you feed the child the fluid that came from your breasts?	Yes.....1 No.....2 Don't know.....7	
304	Are you still breast-feeding the child?	Yes.....1 No.....2	→ Q308
305	How many times did you breast-feed last night between sunset and sunrise? * IF ANSWER IS NOT NUMERIC, PROBE FOR APPROXIMATE NUMBER.	Number of night times of breast-feedings.....□□ Do not.....99	
306	How many times did you breast-feed yesterday during the daylight hour? * IF ANSWER IS NOT NUMERIC, PROBE FOR APPROXIMATE NUMBER.	Number of daylight breast-feedings.....□□ Do not.....99	
307	When do you usually breast-feed the youngest child? – When the child likes to have? When the child cries? On schedule? On convenience? When breast engorged? In Other condition?	<u>Yes</u> <u>No</u> When the child likes to have.....1 2 When the child cries.....1 2 On schedule.....1 2 On convenience..... .1 2 When breast engorged... ..1 2 In Other condition.... ..1 2 Other (specify).....	

308	Starting from the date of birth up to the age of 4-6 months, the youngest child has fed which of the following items? - Nothing is fed? Water/tea? Water & sugar/salt? Cow's milk? Powdered milk? Cereal based fluid? Adult food? Other items? * ONLY FOR A CHILD OLDER THAN 6 MONTHS	<u>Yes</u> <u>No</u> Nothing is fed-----1 2 Water/tea-----1 2 Water & sugar/salt-----1 2 Cow's milk-----1 2 Powdered milk-----1 2 Cereal based fluid-----1 2 Adult food-----1 2 Other items-----1 2 Other (specify)----- Do not..... 7	
309	Starting from the date of birth up to now, the youngest child has fed, which of the following items? - Nothing is fed? Water/tea? Water & sugar/salt? Cow's milk? Powdered milk? Cereal based fluid? Adult food? Other items? * THIS QUESTION BELONGS ONLY TO A CHILD LESS THAN 6 MONTHS OF AGE WHO IS ON BREAST-FEEDING.	<u>Yes</u> <u>No</u> Nothing is fed-----1 2 Water/tea-----1 2 Water & sugar/salt-----1 2 Cow's milk-----1 2 Powdered milk-----1 2 Cereal based fluid-----1 2 Adult food-----1 2 Other items-----1 2 Other (specify)-----	
310	If the child hasn't fed any thing except breast-milk since now, When do you plan to start additional diet? * RECORD COMPLETE MONTHS * THIS QUESTION BELONGS ONLY TO A CHILD WHO IS ON BREAST-FEEDING (CURRENTLY BREAST-FEEDING)	No of complete months---□□	
311	Totally for how many months did you breast-feed the child? * IF LESS THAN ONE MONTH, RECORD '00' MONTHS	Months.....□□ Don't know.....99	

312	For how many months did you feed the last child with breast-milk only? * IF LESS THAN ONE MONTH, RECORD '00' MONTHS	Months.....□□ Don't know.....99																						
313	When did you offer the child with additional diet besides your breast-milk? * RECORD COMPLETE MONTHS * BELONGS ONLY TO A CHILD OLDER THAN 6 MONTHS OF AGE	Months.....□□ Don't know.....99																						
314	In your opinion a child with 4-6 months age thrives best in which of the following feeding? - Breast-feeding only? - Bottle-feeding? - Both are equally good? - Other opinion?	<table border="0"> <thead> <tr> <th></th> <th><u>Yes</u></th> <th><u>No</u></th> </tr> </thead> <tbody> <tr> <td>Breast-feeding only.....</td> <td>1</td> <td>2</td> </tr> <tr> <td>Bottle-feeding.....</td> <td>1</td> <td>2</td> </tr> <tr> <td>Both are equally good.....</td> <td>1</td> <td>2</td> </tr> <tr> <td>Other opinion.....</td> <td>1</td> <td>2</td> </tr> <tr> <td>Don't know.....</td> <td></td> <td>7</td> </tr> <tr> <td>Other (specify).....</td> <td></td> <td></td> </tr> </tbody> </table>		<u>Yes</u>	<u>No</u>	Breast-feeding only.....	1	2	Bottle-feeding.....	1	2	Both are equally good.....	1	2	Other opinion.....	1	2	Don't know.....		7	Other (specify).....			
	<u>Yes</u>	<u>No</u>																						
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Bottle-feeding.....	1	2																						
Both are equally good.....	1	2																						
Other opinion.....	1	2																						
Don't know.....		7																						
Other (specify).....																								
315	In your opinion for how long should a child be totally breast-fed?	No of Complete months.□□ Don't know.....99																						
316	Why did you stop breast-feeding for the youngest child? * THIS QUESTION BELONGS ONLY TO A CHILD WHO IS NOT ON BREAST-FEEDING (NEVER BREAST-FED OR CEASED BREAST-FEEDING).	Not enough milk.....0 Mother ill/weak.....1 Child ill/weak.....2 Nipple/Breast problem.....3 Mother working.....4 Child refused.....5 Weaning age/age to stop.....6 Become pregnant.....7 Started using contraception...8 Other (specify).....9																						
317	How did you let your child stop breast-feeding? * THIS QUESTION BELONGS ONLY TO A CHILD WHO IS NOT ON BREAST-FEEDING (CEASED BREAST-FEEDING).	Gradually.....1 Abruptly.....2 Other (specify)...9																						

318	Do you think that a continuous and frequent practice of breast-feeding can delay conception (pregnancy)?	Yes.....1 No.....2 Don't know.....7																						
319	How many times was the child fed mashed or puréed ^B food or solid or semi-solid food yesterday during the day or at night? * IF 6 OR MORE TIMES, RECORD 6. IF DON'T KNOW, RECORD 7 * THIS QUESTION BELONGS ONLY TO A CHILD OLDER THAN 6 MONTHS OF AGE	Number of times.....□ Don't know.....7																						
320	If you offered the child mashed or fluid foods, what did you use to give the fluid foods with?	<table><tr><td></td><td><u>Yes</u></td><td><u>No</u></td></tr><tr><td>Bottle nipple</td><td>1</td><td>2</td></tr><tr><td>Spoon</td><td>1</td><td>2</td></tr><tr><td>Glass</td><td>1</td><td>2</td></tr><tr><td>By hand</td><td>1</td><td>2</td></tr><tr><td>In Other way</td><td>1</td><td>2</td></tr><tr><td>Other (specify).</td><td>.....</td><td>.....</td></tr></table>		<u>Yes</u>	<u>No</u>	Bottle nipple	1	2	Spoon	1	2	Glass	1	2	By hand	1	2	In Other way	1	2	Other (specify).			
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Spoon	1	2																						
Glass	1	2																						
By hand	1	2																						
In Other way	1	2																						
Other (specify).																								

SECTION-4: CORE QUESTIONS ON THE OCCURRENCE OF ACUTE DIARRHEA

S.No	QUESTIONS & FILTERS	CODE CATEGORIES	SKIP
401	Now I would like to ask you some question about occurrence of acute diarrhea. - Has the child had acute diarrhea in the last two weeks? * TELL TO THE MOTHER THAT DIARRHEA MEANS THREE OR MORE LOOSE/WATERY STOOLS PER DAY.	Yes.....1 No.....2 Don't know.....7	→ Q 411 → Q 411
402	Now I would like to know how much the child was offered breast-milk, other fluid or food during the diarrhea. – Was the child offered breast-milk less than usual to feed, about the same amount, or more than usual, or nothing to feed?	Less than the usual.....1 About the same.....2 More than the usual.....3 Nothing to fed.....4 Don't know.....7	

^β Very finely blended food French word)

403	Was the child offered fluid (other than breast-milk) less than usual to drink, about the same amount, or more than usual, or nothing to drink?	Less than the usual.....1 About the same.....2 More than the usual.....3 Nothing to fed.....4 Don't know.....7																									
404	Was the child offered (food) less than usual to eat, about the same amount, more than usual, or nothing to eat?	Less than the usual.....1 About the same.....2 More than the usual.....3 Nothing to fed.....4 Don't know.....7																									
405	Was the child given any of the following items to drink during the episode of diarrhea? - Fluid from ORS packet? - Home made sugar & salt solution? - Other home made fluids? * FOR A CHILD WHO HAVE TAKEN ANY OF THE DRINKS OR FOODS	<table> <tr> <td></td><td><u>Yes</u></td><td><u>No</u></td><td>^λ<u>DK</u></td></tr> <tr> <td>Fluid from ORS packet</td><td>1</td><td>2</td><td>7</td></tr> <tr> <td>Home made sugar</td><td></td><td></td><td></td></tr> <tr> <td>And Salt solution</td><td>1</td><td>2</td><td>7</td></tr> <tr> <td>Other home made fluids</td><td>1</td><td>2</td><td>7</td></tr> <tr> <td>Other (specify).....</td><td></td><td></td><td></td></tr> </table>		<u>Yes</u>	<u>No</u>	^λ <u>DK</u>	Fluid from ORS packet	1	2	7	Home made sugar				And Salt solution	1	2	7	Other home made fluids	1	2	7	Other (specify).....				
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Home made sugar																											
And Salt solution	1	2	7																								
Other home made fluids	1	2	7																								
Other (specify).....																											
406	What is your reason to restrict the child any thing per mouth during the episode of diarrhea? * FOR A CHILD WHO HAVE NOT TAKEN ANY OF THE DRINKS OR FOODS	Stops diarrhea..... 1 Not to aggravate the diarrhea...2 Don't know.....7 Other (specify).....9																									

^λ Don't know

407	Was any thing else given to treat the diarrhea?	Yes.....1 No.....2 Don't know.....7	→ Q 409 → Q 409
408	What was given to treat the diarrhea? - Anything else? * RECORD ALL MENTIONED	Yes No Pill or syrup.....12 Injection.....12 Intravenous fluid.....12 Home remedies/herbal medicine.....12 Other items.....12 Other (specify).....	
409	Did you seek advice or treatment from some one outside the home for the child diarrhea?	Yes.....1 No.....2 Do not.....7	→ Q 411
410	Where did you seek advice or treatment? - Gov't health facilities? - Non-gov't health facilities? - Private clinic? - drug shop? - Anywhere else?	Yes No Gov't health facilities ...12 Non- gov't health facilities NGO.....12 Private clinic12 Drug shop12 Anywhere else.....12 Other (specify)	
411	Now I would like to ask some questions about hand washing and child stool disposal. -The last time you fed your child using your hands, did you wash your hands immediately before feeding?	Yes.....1 No.....2 Don't know.....7	
412	The last time you cleaned the child after s/he defecated, did you wash your hands immediately afterwards?	Yes.....1 No.....2 Don't know.....7	
413	What usually happens with your youngest child's stools when s/he doesn't use any toilet facility?	Throw in the toilet/latrine.....1 Throw outside the welling.....,2 Bury outside the elling.....3 Rinsed away.....4 Not disposed off.....5 Other (specify)...9	

414	How much do you think that continuing breast-feeding during the time of diarrhea is important?	Extremely important.....1 Very important.....2 Some what important.....3 Not important.....4 Don't know.....7	
415	What do you think about the importance of continuous and long term breast-feeding of the child in preventing the occurrence of acute diarrhea?	Extremely important.....1 Very important.....2 Some what important.....3 Not important.....4 Don't know.....7	

THANK YOU

Checked by supervisor:

Name-----

Signature -----

Date-----

DECLARATION

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

Name _____

Signature _____

Place _____

Date of submission _____

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

Name _____

Signature _____