

**KNOWLEDGE AND PRACTICE OF MOTHERS/CAREGIVERS  
ON HOME MANAGEMENT OF DIARRHEA IN UNDER FIVE  
CHILDREN IN MAREKA DISTRICT, SOUTHERN ETHIOPIA**



**By: Terefe Dodicho (BSc)**

**A THESIS SUBMITTED TO DEPARTMENT OF EPIDEMIOLOGY,  
COLLEGE OF HEALTH SCIENCES, JIMMA UNIVERSITY, IN PARTIAL  
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF PUBLIC HEALTH IN EPIDEMIOLOGY**

**June, 2015  
Jimma, Ethiopia**

**Knowledge and practice of Mothers/Caregivers on Home Management of Diarrhea in under five children in Mareka District, SNNPR, Ethiopia**

**By: Terefe Dodicho (BSc)**

**Advisors:-**

**Professor Kifle Woldemichael (MD, MPH, Professor)**

**Mr. Henok Asefa (BSc, MSc, Assistant Professor)**

**June, 2015**

**Jimma, Ethiopia**

## **Abstract**

**Back ground:** Diarrhea is defined as the passage of unusually loose or watery stool at least 3 times in a 24-hour period. The vast majority (78%) of deaths from diarrhea are among children under 5 years of age living in low and middle income countries. Early and correct identification of diseases and prompt initiation of management plays a key role in reducing diarrhea related mortality. However, available studies provided inadequate information on knowledge and practice of mothers/caregivers on home management of childhood diarrhea.

**Objective:** to assess the knowledge and practice of mothers/caregivers on home management of diarrhea in under-five children in Mareka district, Dawuro zone, SNNPR.

**Methods:** Community based cross-sectional study was employed from March 1-30, 2015. Multi stage stratified sampling technique was used to select subjects to be included in the study. Data were collected using structured interviewer administered questionnaire. The main contents of the questionnaire were socio-demographic information, information on knowledge & practice on diarrhea management at home. Data were entered using Epi Data software version 3.1 and exported to & analyzed by using statistical package for social science (SPSS) software version 16.0.

**Results:** Out of 654 mothers/caregivers who participated in the study, 265 (40.5%) mothers/care givers said that their children had an episode of diarrhea during the last two weeks. The level of knowledge among respondents on home management of diarrhea was found to be good in 438 (67%) respondents and poor in 216 (33%) respondents respectively. But the level of practice on home management of diarrhea among respondents was good in 309 (47.2%) respondents and poor in 345 (52.8%) respondents respectively. Only 50 (37.6%) respondents were aware about the correct amount of ingredients of homemade ORS (salt-sugar solution).

One hundred ninety four respondents supported diet withdrawal during episodes of diarrhea in their children. Mothers educational level secondary and above [AOR= 3.280; 95%CI (1.281, 8.390)], mothers of male index child [AOR= 2.508; 95%CI (1.721, 3.656) and mothers residence in urban areas [AOR= 21.282; 95%CI (5.937, 36.279) were significantly associated with mothers' knowledge on home management of diarrhea in children.

Mothers aged 25 years and above [AOR= 4.768; 95%CI (2.281, 9.966)], mothers with educational level secondary and above [AOR= 6.791; 95%CI (2.376, 9.413)] and mothers residence in urban areas [AOR= 13.048; 95%CI (4.525, 17.627)] were significantly associated with mothers' practice on home management of diarrhea in children.

**Conclusion:** Despite the high rate of diarrhea among under-fives in this community, there is a wide gap in the knowledge and practice of mothers regarding home based management of diarrhea. Therefore, strategies to increase awareness and practice of mothers on home management of diarrhea are needed.

**Key words:** childhood diarrhea, home management, knowledge and practice of mothers.

## **Acknowledgment**

First and foremost, I thank the Almighty God for giving me strength and wisdom to successfully complete this document.

I would like to thank Jimma University for financial support and Dawuro zone health department & Mareka woreda health office for provision of important baseline information.

My special thanks go to my advisors Kifle Woldemichael (MD, MPH, and Professor) and Henok Asefa (BSc, MSc, Assistant professor) for their valuable assistance in the time of this paper development.

I want to give my sincere appreciation to data collectors, supervisors and participants for their willingness to participate in study.

Finally I would like to extend my heartfelt thanks to my families (teacher Ejigua Dodicho, teacher Teshome Tekle, w/ro Etagegnehu Haile & my lovely son Abiy Terefe) and my friends (Mr. Gezahegn Mega, Mr. Mitiku Kenbu, Mr. Gosahun Dosa & teacher Kifle Sapore) for giving supportive financial and moral advice, without them this work would not be completed.

# Table of contents

Contents	Page No.
Abstract.....	I
Acknowledgment.....	III
Table of contents.....	IV
List of tables.....	VI
List of figures.....	VI
Acronyms and abbreviations.....	VII
1. Introduction.....	1
1.1 Back ground.....	1
1.2 Statement of the problem.....	3
2. Literature review.....	5
3. Objective of the study.....	14
3.1 General objective.....	14
3.2 Specific objectives:-.....	14
4. Methods & Materials.....	15
4.1 Study area and period.....	15
4.2 Study design.....	15
4.3 Populations.....	15
4.4 Inclusion criteria.....	15
4.5 Exclusion criteria.....	16
4.6 Sample size determination and sampling procedure.....	16
4.7 Data collection instrument and procedure.....	19
4.7.1 Data collection Instrument.....	19
4.7.2 Data collectors.....	19
4.7.3 Data collection procedure.....	19
4.8 Variables.....	20
4.8.1 Dependent variable.....	20
4.8.2 Independent variables.....	20
4.9 Data quality management.....	21

4.10 Data processing and analysis procedure.....	21
4.11 Ethical consideration.....	22
4.12 Dissemination plan.....	22
4.13 Operational definition of terms.....	23
5. Results.....	24
5.1 Socio-demographic characteristics of study participants.....	24
5.2 Knowledge of mothers/caregivers.....	26
5.3 Practice of mothers/caregivers.....	28
5.3 Factors affecting knowledge of mothers on home management of diarrhea.....	31
5.4 Factors affecting practice of mothers on home management of diarrhea.....	34
6. Discussion.....	37
Strength and limitation of the study.....	41
7. Conclusion and recommendation.....	42
7.1 Conclusion.....	42
7.2 Recommendation.....	43
References.....	44
Annexes.....	47
Questionnaire.....	47
English version questionnaire for individual interview.....	47
Questionnaire on local language.....	54

## List of tables

Table	page No.
Table 1 Socio-demographic characteristics of mothers/caregivers, Mareka woreda, 2015 .....	24
Table 2 Table 3 Socio-demographic characteristics of mothers/caregivers and an index child, Mareka woreda, 2015.....	25
Table 4 Respondents' knowledge on definition, causes and danger signs of diarrhea in children, Mareka woreda, 2015.....	26
Table 5 Respondents' knowledge on types of diarrhea and preferred foods/fluids by mothers, Mareka woreda, 2015.....	27
Table 6 Respondents' practice on home management of diarrhea in children, Mareka woreda, March, 2015 .....	29
Table 7 Respondents' practice on home management of diarrhea in children using ORS & SSS, Mareka woreda, March, 2015 .....	30
Table 8 Bivariate analysis of socio-demographic factors affecting knowledge of mothers on home management of diarrhea, Mareka woreda, 2015.....	32
Table 9 Multivariate logistic regression analysis showing factors associated with mothers' knowledge, Mareka woreda, 2015 .....	33
Table 10 Bivariate analysis of socio-demographic factors affecting practice of mothers on home management of diarrhea, Mareka woreda, 2015.....	35
Table 11 Multivariate logistic regression analysis showing factors associated with maternal practice, Mareka woreda, 2015.....	36

## List of figures

Figure 1 Conceptual framework on home management of diarrhea.....	12
Figure 2 Schematic presentation of sampling technique .....	18



## **Acronyms and abbreviations**

CDD- control of diarrheal disease

CSA- central statistics agency

ETB- Ethiopian Birr

HH- household

IMCI- integrated management of childhood illness

JU- Jimma University

MDG- millennium development goal

ORS-oral rehydration solution

ORT- oral rehydration therapy

PHC - primary health center

SNNPR- southern nations, nationalities and peoples region

SPSS- statistical package for social sciences

SSS- salt sugar solution

Tsf-teaspoonful

UNICEF- United Nations international children fund

WHO- world health organization

# 1. Introduction

## 1.1 Back ground

Diarrhea is defined as the passage of unusually loose or watery stool at least 3 times in a 24-hours period. It is the consistency of the stools that is most important, rather than the frequency. Frequent passing of formed stools is not considered as diarrhea. Similarly, breastfed babies pass loose, 'pasty' stools sometimes up to 6 to 7 times a day which should not be considered as diarrhea. The main problem with acute diarrhea is its ability to cause rapid fluid loss through stools in addition to electrolytes loss. The volume of fluid loss can vary from 5ml/kg body weight/day to  $\geq 200$  ml/kg body weight/day(1).

Diarrhea is a major health problem. It is usually a symptom of an infection in the intestinal tract, which has a variety of causative agents including viruses, bacteria and parasites. Diarrheal infection spreads through the ingestion of contaminated food or drinking-water, or person-to-person as a result of poor hygiene.

There are three clinical types of diarrhea:

- (i) Acute watery diarrhea which lasts several hours or days;
- (ii) Acute bloody diarrhea, also called dysentery; and
- (iii) Persistent diarrhea that lasts 14 days or longer.

The vast majority of deaths from diarrhea are among children under 5 years of age living in low- and middle income countries. Diarrheal disease due to unsafe water and lack of sanitation is the greatest cause of morbidity and mortality in under-five children in the world, especially in poor countries(1,2).

According to the World Health Organization (WHO) and UNICEF, there are about two billion cases of diarrheal disease worldwide every year, and 1.9 million children younger than 5 years of age perish from diarrhea each year, mostly in developing countries. This amounts to 18% of all the deaths of children under the age of five and means that more than 5,000 children are dying every day as a result of diarrheal diseases. Of all child deaths from diarrhea, 78% occur in the African and South-East Asian regions. Each child under 5 years of age experiences an average of three annual episodes of acute diarrhea (3).

Globally in this age group, acute diarrhea is the second leading cause of death (after pneumonia), and both the incidence and the risk of mortality from diarrheal diseases are greatest among children in this age group, particularly during infancy- thereafter, rates decline incrementally. Other direct consequences of diarrhea in children include growth faltering, malnutrition, and impaired cognitive development in resource-limited countries. During the past three decades, factors such as the widespread availability and use of oral rehydration salts (ORS), improved rates of breastfeeding, improved nutrition, better sanitation and hygiene, and increased coverage of measles immunization are believed to have contributed to a decline in the mortality rate in developing countries (3).

Policies such as Control of Diarrheal Diseases (CDD) 1993, IMCI 1997, IMCII Household Component 2000, Hand Washing Policy 2009 and Revised CDD 2010 were formulated to provide guidelines on the control and management of childhood diarrhea yet diarrhea disease continues to be a major cause of disease burden. Various programs such as maternal and child health (MCH), expanded program on immunization (EPI), control of diarrhea diseases (CDD) and integrated management of childhood illnesses (IMCI) were introduced in order to improve the quality of care and reduce morbidity and mortality and improve child survival. Studies have shown that mothers can give ORS at home, reduce hospital visits and therefore cut down on the treatment cost for diarrhea disease (4).

The WHO definition of home case management for diarrhea allows for flexibility:

- Begin early use of available food-based fluids (except heavily salted soups or very sweet drinks) and/or give oral rehydration solution (ORS) if available and affordable.
- Continue breastfeeding if the child is breastfed; give frequent and small amounts of food during diarrhea and continue with catch-up feeding for two weeks following the diarrhea episode.
- Recognize danger signs of diarrhea that require immediate care and seek help from an appropriate provider.
- Give zinc supplements (tablets or syrup) for 10-14 days(5).

## **1.2 Statement of the problem**

Acute diarrhoea is the second most important cause of childhood mortality worldwide. It is estimated that each year, approximately 1.9 million children younger than 5 years of age dies of acute diarrhoea. This amounts to 18% of all the deaths of children under the age of five and means that more than 5,000 children are dying every day as a result of diarrheal\_diseases (1,2). More than 80% of child deaths due to diarrhea occur in Africa and South Asia. In African countries including Ethiopia, each child on average suffers from five episodes of diarrhea per year (6).

Ethiopia is one of the top 15 countries in which nearly  $\frac{3}{4}$  of child death occur due to diarrhea. Diarrhea is the second leading cause of under-five-year mortality in Ethiopia accounting 73,700 deaths per year(7). The Ethiopian Demographic and Health Survey (EDHS) 2011 reported 13% of children under age 5 had diarrhea, and 3% had had diarrhea with blood in the two weeks before the survey(8). In the study conducted in Arbaminch zuria woreda, south west Ethiopia, the overall prevalence of diarrhea was high (30.5%) and only 32.4% of caregivers have a comprehensive knowledge about the cause of diarrhea and its transmission methods. In the same study, as management of diarrhea at home, 40% of mothers gave ORS and 29.4% gave homemade fluid but 31% of mothers didn't give anything to control or manage the diarrhea(9).

Millennium Development Goal number 4 is a target to reduce under-five mortality rates, at global level, by two-thirds over the years 1990 to 2015. The survival of children in developing countries depends on the family's and community's ability to access basic needs to support life. Integrated Management of Childhood Illness (IMCI) is the main framework within which the current child health interventions are implemented in developing countries. Stronger emphasis was initially on the treatment and management of cases. However, the household (family) and community component (Community IMCI) was introduced with a set of sixteen key family practices which aim at addressing child health, survival and development at household and community level (7).

The family practices target among others, diarrhea prevention and control through use of safe water supplies and sanitation facilities, food hygiene, correct management of diarrhea at home, prompt referral of a sick child and adherence to advice and treatment. In most instances with uncomplicated diarrhea, oral rehydration therapy is the treatment of choice and is sufficient in a majority of cases. Drug therapy is unnecessary in most cases, and may even be contraindicated or dangerous because majority of diarrhea cases in children are viral in origin (1, 2).

The present study was undertaken to determine the knowledge and practice of mothers/care givers regarding home-based management of diarrhea in under-five children in one of the rural area of Ethiopia, Mareka district. So, the findings of this study need to develop interactive communication strategies for the health workers and mothers to address perceptions and misconceptions and facilitate positive change in the household practice on management of diarrhea among under-fives.

## **2. Literature review**

### **2.1 Home management of diarrhea**

Treatment and prevention of diarrhea can be done at home by primary caregivers. The importance of home management of diarrhea lies in the fact that diarrhea starts at home, and continues at home on return from being seen at a health facility. A lot of fluid is lost in diarrheal stools, and if suitable fluids are given in adequate volumes soon after the onset of diarrhea, dehydration can often be prevented. However, the fluids given must meet certain criteria when given in large volumes. They are easy to prepare, but should be familiar and acceptable to the child, and effective. Specific recommendations such as rice water, soup, yogurt, and oral rehydration salt (ORS) agreed on by the UNICEF are important(5).

Feeding of the child should continue, particularly with plenty of nutritious food, to prevent any decline in growth necessarily during and after the episode of diarrhea. Mothers usually prefer traditional methods of managing diarrhea, and only seek medical advice when it fails. Unfortunately, this is usually too late. The child is either already dehydrated or has started to lose weight. Therefore, it is important to notice and identify certain symptoms or signs in order to seek medical advice promptly. Most diarrheas can be managed at home and without drugs. Parents need to recognize danger signs and seek appropriate treatment(7).

### **2.2 Socio-demographic factors affecting knowledge and practice of mothers/caregivers**

Home management of diarrhea is influenced by socio-demographic factors such as education, age, occupation, income and marital status of mothers. Education increases the care giver's chance of getting information on the need using home available fluids and ORS solution. The study done in India showed that mothers with educational level of secondary or above and employed mothers had good knowledge (showed significant effect) on home management of diarrhea. Non-working status and schooling primary or less had no significant effect on knowledge of mothers(10).

Finding from Kashan, Iran, showed age of the mother (older than 31 years), number of children (3 or more children) and occupation (working outside home) of the mother had significant

association with knowledge of mothers on home management of diarrhoea, but level of education had no significant relation to knowledge(11). In the Republic of Kosovo, mothers with secondary or higher education gave more fluids to their children compared to mothers with less education and the difference is significant(12).

The report from Puducherry, India, showed mothers with low income and those educated only till class eight were almost twice less likely to know about ORS preparation as compared to better educated mothers(13). Finding from Kerim, Iran, indicated that occupation of mothers and number of children had significant effect on maternal practice in contrast to their age and educational level(14).

In Ibadan, Nigeria, knowledge of mothers on ORT had significant association with urban residence, but education, age, occupation and religion have no significant relationship(15). In Iran, mothers who are employed and with educational level of secondary and above had better knowledge and practice and the association was significant(16,17).

In Nigeria, food restriction is common in mothers with primary and lower educational level. In the same study, level of education (tertiary or more) and use of ORS in treatment of diarrhea was significantly related(18). Another report from Ibadan, Nigeria, showed mothers' level of education (primary and lower) was significantly associated with their knowledge towards food restriction during acute diarrhea(19).

### **2.3 Knowledge of mothers/ care givers**

Though simple and effective treatment measures which can markedly reduce diarrhoea associated morbidity and mortality are available, yet in developing countries due to poor knowledge in the community related to diarrhoea and oral rehydration solution (ORS), diarrhoea remains to be a major public health problem. Important fact about diarrhoea is care about children for easier course. Very often child care is not adequate because of low knowledge and attitude and wrong practice. It is therefore important for mothers and primary care givers to be aware of strategies for management of diarrhea.

Studies conducted in many countries indicate that the knowledge and practice of mothers is not adequate and it emphasizes the need for behavior change communication in specific target group i.e. mothers and health care providers which may lead to substantial decrease in morbidity and mortality due to diarrhea(16,17,20,21).

In Ibadan Metropolis, Nigeria, although 82% of respondents said they have heard about ORT packet, only 61% were knowledgeable about the therapy as indicated by describing the treatment correctly, recognizing the packet or reciting the home recipe. Only 36% of respondents know a place where ORT packets could be purchased. The most frequent answer to the question about the perceived mode of action of ORT was the replacement of water loss (32%) while 6% cited the prevention of dehydration. In the same study, although 52% of mothers believed diarrhea can be cured, 74% preferred modern medicine, 14% thought diet should be changed and only 1% thought ORS should be given immediately(15).

The study done in Aligarh, India showed that knowledge of mothers regarding danger signs of diarrhea is good (78%) and the most prominent signs mentioned were watery stools (83%), repeated vomiting (57%) and blood in stool (32%) respectively. Out of 72% mothers who know about ORS, only 30% knew about the correct method of preparation of oral rehydration salt solution. In the same study 36% of the respondents knew about home available fluids, out of which salt sugar solution was the choice in majority(48.8%) of cases(22).

Finding from Kashan, Iran showed 28.8% of the mothers had a good knowledge in diarrhea diagnosis and treatment, while 46.5% had medium and 24.7% scored low(11). A report from Zahedan, Iran showed that knowledge of the majority (64.3%) of mothers regarding diarrhea and diet was moderate and only 3.7% had good knowledge. The most common danger signs explained by respondents were vomiting (23.7%), loss of appetite (16.3%) and reduced level of consciousness (6.3%) respectively. In the same study, 45.7% of mothers were aware of the importance of measles vaccination in preventing diarrhea(16).



Another report from Tabriz University of Medical Sciences, Iran showed that mothers' knowledge score about the role of ORS in the compensation of dehydration in pediatric diarrhea was poor, medium and good in 37.23%, 44.24%, and 18.53% of the mothers respectively(17).

Finding from Rwanda showed that 44% of mothers seemed to have adequate knowledge pertaining to ORS preparation and its significance in the management of diarrhea but 4% of the mothers did not know about ORS(23).

In Puducherry, India, 43% of mothers were not aware of any danger sign. Three-fourths of mothers had heard of Oral Rehydration Solution (ORS) and knew how to prepare and administer ORS. Also, majority (82.9%) of mothers were aware about home available fluids for rehydration. In the same study, around half of the mothers who knew about ORS thought that ORS should be discontinued if diarrhea persisted or vomiting developed(13).

The report from Pakistan indicated that almost two third of respondents were aware about the ingredients of ORS but their knowledge about correct amount was poor(20). In Nigeria, although 70% of respondents identified the oral rehydration salt (ORS) sachet correctly, only 55.5% said it is used to replace lost fluids/ electrolyte. Forty-one percent gave correct response about the preparation of sachet ORS and 40% were able to mention correctly the components of homemade ORS(18). Another finding from Ibadan, Nigeria indicated that 54.8% of mothers had good knowledge on oral rehydration therapy(19).

Finding from Nepal showed mothers had some basic knowledge about the prevention of diarrhea, and fluids/foods which can or cannot be given during bouts of diarrhea. Knowledge about signs of dehydration was poor. None of the mothers were able to mention all the steps for correct and complete preparation of oral rehydration salt (ORS) and salt-sugar-water (SSW) solutions. Only 8.5% of the mothers stated that the purpose of giving ORS solution during diarrhea is to prevent the child from getting dehydrated(21).

## **2.4 Practice of mothers/care givers**

Cultural dictates and nutritional habits in different communities increase the nutritional problems of diarrheal episodes. Though most episodes of diarrhea are mild, acute cases can lead to significant fluid loss and dehydration, which may result in death or other severe consequences if fluids are not replaced at the first sign of diarrhea.

In the study conducted in Cape Town, South Africa, most caregivers (78.9%) gave ORT at home before seeking help from a healthcare practitioner. Of these, 67.9% gave homemade SSS, and 12.5% mixed this incorrectly. Thirty-six percent gave ORT and/or milk but no additional volume of daily fluid intake, and 35.2% stopped their usual milk feeds and only gave other fluids, including ORT(24).

Finding from India showed that most (62%) of the mothers/caregivers were in favor of giving of breast milk as preferred oral fluid during diarrheal episode. Nearly one fourth (26.1%) of mothers/caretakers identified signs and symptoms of dehydration and the need for consultation. During diarrheal episodes fewer amounts of food and fluid was given by 49.9% and 20.4% mothers/caretaker respectively(10).

Finding from Kashan, Iran showed 56% of mothers had a moderate practice on diarrhea and diet and only 2.3% had a good practice. Eighty eight percent of mothers gave ORS solution to their children and 12% of them used apple juice(11). Another report from Tabriz University of Medical Sciences, Iran showed that the performance of 52%, 30% and 18% of the mothers was poor, medium and good, respectively(17).

In the Nyando district, Kenya 70% of mothers decreased fluid intake during diarrhea episodes. The mothers perceived wheat flour, rice water and selected herbs as anti-diarrheal agents. During illness, 27.8% of the children were reported not to have drunk any fluids at all, 52.5% drunk much less and only 10.0% were reported to have drunk more than usual. A significant number (89.6%) of respondents withheld milk including breast milk with the notion that it enhanced diarrhea(25).

The report from the Republic of Kosovo showed that in case of children diarrhea, 62.6% of mothers/caregivers declared that they provide less or even not at all fluids, while 19.6% as usual and only 17.8% more than usual. Forty four percent of mothers did breastfeed their babies less than usual and only 7.5% cases breastfeed more than usual during diarrhea. One third of the mothers do not give anything to their children in term to stop the diarrhea, 19.6% use rice juice, 15.9% use banana, and only 9.3% use oral rehydration solution(12).

Finding from Pakistan showed that for the management of diarrhea, 82.7% mothers took their children to primary health care centre. In the same study, 87.4% of mothers said that ORS should be used within 24hours of preparation and 86.6% said ORS should be continued till diarrhea persists(20). In Nigeria,71% of respondents withdrawn food during acute diarrhea in infants, 44% reduced breastfeeding frequency during acute diarrhea and 71.2% of these cited cultural reasons for withholding breastfeeding(19).

In Ethiopia, diarrhea is the second leading cause of under-five-year mortality(26). The two-week prevalence of less than five years diarrhea ranges from 10% to 40% in different parts of Ethiopia(27–30). The study conducted in Arbaminch district showed 31% of mothers did not give anything to manage the diarrhea(27). Another report from Kersa district showed 73% of mothers used ORT before seeking help from health professionals(31). According to the 2006E.c (2014) annual report, in the current study area (Mareka woreda), pediatric diarrhea is the third common cause of morbidity accounting 6,236 of causes.

## **2.5 Source of information on knowledge and practice**

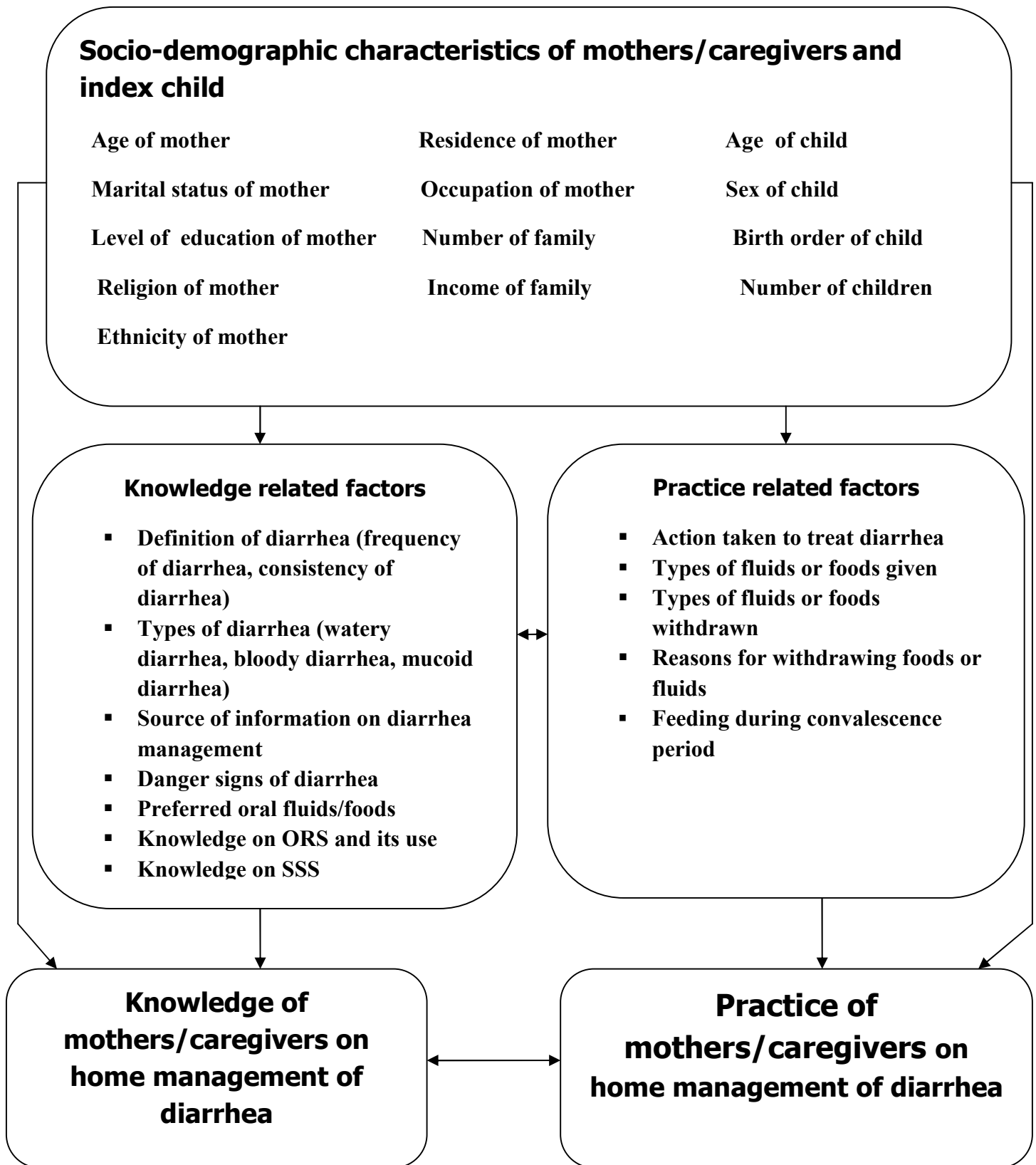
Adequate information is needed in order to build mothers with considerable knowledge and skill on home management of diarrhea. In Ibadan Metropolis, Nigeria, 65% of mothers got information on ORT from health centers and media(15). Another report from Nigeria showed the major source of information on preparation of ORS were hospital(37%), mass media(30%), pharmacists(12.5%), relatives(7.5%) and friends(7%) respectively(18).

The report from Zahedan, Iran showed that mothers claimed physician consultation (51%) and health center staff (44.6%) as a major source of information on ORS use. In Rwanda, mothers explained physician (37%), media (25%) and grandmothers (20%) as a major source of information on ORS use(23). In Kersa, Ethiopia, 79.8% of mothers got information on ORT from health workers(31).

## **2.6 Conceptual framework**

Home management of diarrhea is influenced by many factors which are interrelated. Socio-demographic factors such as education increases a care givers autonomy regarding decision making for seeking health care for diarrhea. Education also increases the care giver's chance of getting information on the need using home available fluids and ORS solution. The age of the care givers is likely to ensure that their children use ORS and home available fluids since the young care givers do not have experience about dangers of diarrhea. Marital status is likely to determine the home management of diarrhea since married women are more likely to get support than those unmarried.

Factors such as knowledge on danger signs of diarrhea, knowledge on the correct use of ORS solution, timeliness of seeking care, decision for child treatment, mode of acquisition of ORS, availability of ORS in the house and practice on preparation & provision of home available fluids all tend to determine home management of diarrhea in under-five children. The conceptual frame work in the next page is developed after thorough revision of related literatures.



**Figure 1 Conceptual framework on home management of diarrhea**

## **2.7 Significance of the study**

Diarrhea is among those communicable diseases which is both preventable and curable. Early and correct identification of diseases and prompt initiation of management plays a key role in reducing diarrhea related mortality. Increased fluid intake and continued feeding by caregivers especially by mothers are vital measures that prevent diarrhea related child mortality. The Ethiopian health sector development program IV targets to achieve the Millennium Development Goal 4 of reducing child mortality by two-thirds by 2015.

However, available studies and information provided limited or inadequate knowledge and practice on home management of childhood diarrhea. It is therefore important for mothers and primary care givers to be aware of strategies for management of diarrhea. This study will also provide information to policy makers and planners in improving childhood morbidities and mortalities due to diarrhea through development of interactive communication strategies for the health workers and mothers to address perceptions and misconceptions and facilitate positive change.

### **3. Objective of the study**

#### **3.1 General objective**

To assess the level of knowledge and practice of mothers /caregivers regarding home management of diarrhea in under-five children.

#### **3.2 Specific objectives:-**

- To assess the level of knowledge of mothers/caregivers on home management of diarrhea in under-five children in Mareka woreda.
- To assess the level of practice of mothers/caregivers on home management of diarrhea in under-five children.
- To assess the factors affecting knowledge and practice of mothers/caregivers on home management of diarrhea in under-five children in Mareka woreda.

## **4. Methods & Materials**

### **4.1 Study area and period**

This study was conducted in Mareka woreda which is one of the 5 woredas in Dawuro zone, SNNPR, Ethiopia. The capital city of the woreda is Waka which is located 500 KMs (through Butajira-Hossana-Wolaita Sodo) South West of Addis Ababa, the capital city of Ethiopia and 398 KMs from the regional capital city, Hawassa. The woreda is administratively structured in to 37 kebeles (34 Rural and 3 Urban). Projecting from 2007 census, the estimated total population of the woreda is 147,950 of which 23,095 are children below five years of age in 2014 (32). The health infrastructure in the woreda comprised of 4 health centers, 37 health posts, 1 pharmacy, 1 rural drug vendor and 1 lower clinic. With regard to man power, there are 83 health professionals and 70 rural and 2 urban health extension workers in the woreda. The study was conducted from March 1- 30/ 2015.

### **4.2 Study design**

Community based cross-sectional study

### **4.3 Populations**

#### **4.3.1 Source Population**

All mothers/caregivers of children aged less than five years in Mareka woreda

#### **4.3.2 Study population**

Selected mothers/caregivers who have at least one child below five years old

### **4.4 Inclusion criteria**

Mothers/caregivers having at least one child under the age of five years and lived in the study area for at least 6 months



## 4.5 Exclusion criteria

Mothers/care givers who have hearing & talking problem and those who are severely ill were excluded from the study.

## 4.6 Sample size determination and sampling procedure

### 4.6.1 Sample size determination

The prevalence of knowledge and practice level of mothers/caregivers on home management of diarrhea in under-five children for the area (Mareka district) is not known from previous studies. Hence, the sample size for this study was determined based on a single population proportion formula by taking prevalence of diarrhea to be 30.5% (proportion of diarrhea in under five children and its home management among mothers which was conducted in Arba Minch zuria woreda, SNNPR)(9). Using Epi info version 7 and considering assumptions: confidence level= 95% and degree of precision (margin of error) =5%, sample size was calculated as follows:

$$n = \frac{(z_{\alpha/2})^2 \times p(1-p)}{d^2}$$

$$n = \frac{(z_{\alpha/2})^2 \times pq}{d^2}$$

Where, n= minimum sample size

$Z_{\alpha/2}$ = critical value at 95% confidence level (1.96)

p= proportion of diarrhea among under-five children

q= 1-p

d= degree of precision

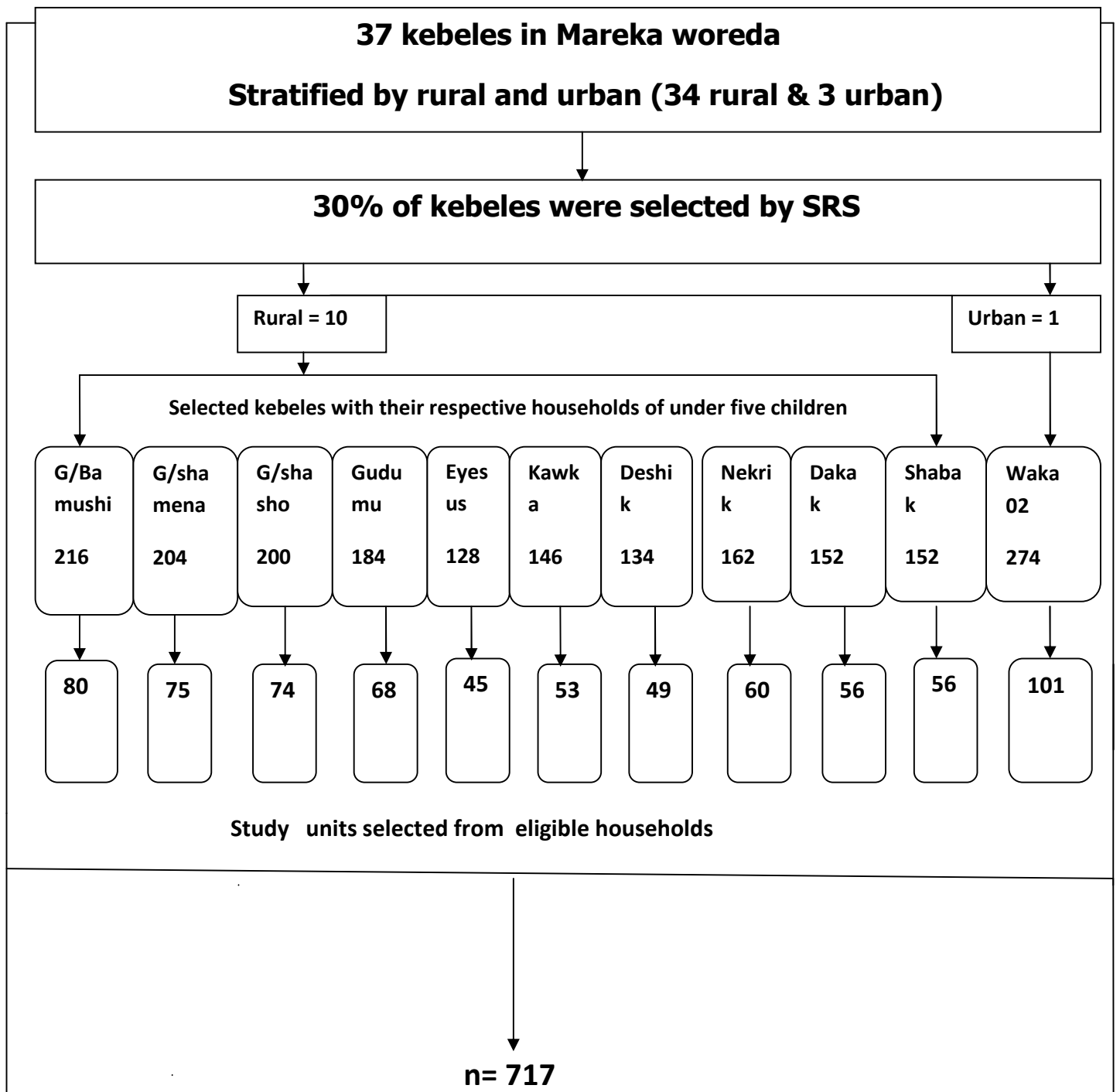
$$n = \frac{(1.96)^2 \times (0.305)(0.695)}{(0.05)^2} = 326$$

Taking 10% adjustment for non response and 2 for design effect, the final sample size was

$$\begin{aligned} n &= (326 \times 2) = 652 \\ &= 652 + 65 = \underline{\underline{717}} \end{aligned}$$

#### **4.6.2 Sampling technique**

Multi-stage sampling technique was used to select the study participants. First, all the Kebeles in the district were stratified in to urban and rural. Then 1 out of 3 urban and 10 out of 34 rural Kebeles were selected randomly. Since every family folder has monthly updated household information including vital events and their unique household ID number, family folders in health post were used for identification of eligible households in selected Kebeles. Unique consecutive numbers were re-assigned for identified eligible households to generate proportionally allocated samples from selected eleven kebeles. Finally, a total of 717 Sample size was allocated to all randomly selected Kebeles proportionately based on number of under-five children and the study participants were selected by using systematic random sampling technique using sampling interval (K) calculated from total eligible households and total sample size ( $k = 1,952/717 = 2.7 \approx 3$ ).



**Figure 2 Schematic presentation of sampling technique**

## **4.7 Data collection instrument and procedure**

### **4.7.1 Data collection Instrument**

Data were collected by using a pre-tested structured questionnaire which was designed after thorough literature search. Questionnaire was translated into local language (Dawurogna) and re-translated back to English. The data were collected via personal interview.

The questionnaire was divided into 3 sections:

The first section included socio-demographic information of the mother/caregiver and an index child. The second section included questions regarding maternal knowledge about pediatric diarrheal disease management. The last section included questions regarding maternal practice in cases of pediatric diarrhea management..

### **4.7.2 Data collectors**

Data collectors were 9 trained diploma nurses who are fluent in the local language and three supervisors were recruited. Two days training on how to fill the questionnaire was conducted. Mock interviews and practical field exercise was given to data collectors and supervisors to ensure the quality of the field operation. During data collection, the supervisors followed data collectors and performed quality checks with principal investigator.

### **4.7.3 Data collection procedure**

House numbers of study units selected for the study were given for data collectors and supervisors assigned for Kebeles. In the household having more than one children aged less than 5 years, the youngest child(5) was selected to collect information on the child's demographic and health characteristics(7,8,17). On the first visit, data collectors interviewed mothers/caregivers if they were available otherwise they arrange the time convenient to interview.

## **4.8 Variables**

### **4.8.1 Dependent variable**

- The level of knowledge of mothers/caregivers about home management of diarrhea
- The level of practice of mothers/caregivers about home management of diarrhea

### **4.8.2 Independent variables**

#### **I. Socio- demographic characteristics of mothers/caregivers**

- Age
- Marital status
- Religion
- Ethnicity
- Occupation
- Level of education
- Residence
- Number of family members
- Number of living children
- Average monthly income of the family

#### **II. Demographic characteristics of an index child**

- Age
- Sex
- Birth order

#### **III. Knowledge related factors**

- Definition of diarrhea (frequency of diarrhea, consistency of diarrhea)
- Types of diarrhea (watery diarrhea, bloody diarrhea, mucoid diarrhea)
- Source of information on diarrhea management
- Danger signs of diarrhea
- Preferred oral fluids/foods
- Knowledge on ORS and its use
- Knowledge on SSS and its use

### III. Practice related factors

- Action taken to treat diarrhea
- Types of fluids or foods given
- Types of fluids or foods withdrawn
- Reasons for withdrawing foods or fluids
- Feeding during convalescence period

## **4.9 Data quality management**

Questionnaire was prepared in English language and translated to Dawroigna by two experts (language expert in Dawroigna and public health expert) and re-translated back to English by another local language expert and public health expert to ensure consistency. Two days training was provided for data collectors. Questionnaire was pre-tested on 5% of samples (36 mothers) a week before actual data collection period in neighboring woreda (kebeles found in Tocha woreda which is 20km away from Waka town).

After pre-testing, no modification was done on questionnaire. In addition, at time of data collection, filled questionnaires were checked for completeness and consistency of information by supervisors on daily basis and typographic errors were manually edited. Any ambiguity and other problems related to data collection were addressed by communicating with the data collectors. To minimize errors, data was double entered by using Epi Data version 3.1 software.

## **4.10 Data processing and analysis procedure**

Data was checked, cleaned and edited for completeness, outliers and missing values. It was entered to Epi Data version 3.1 and exported to SPSS windows version 16.0 for analysis. Descriptive analysis was carried out for each of the variables. Maternal knowledge was determined by summing up the scores from the response to the questions. A correct response was given a score of one, and an incorrect one a score of zero. The mean value for knowledge related correct responses was 13.43. Total responses above mean value were considered as good and those below mean value were considered as poor. The total possible score for knowledge was 16. “Good knowledge” was described by an aggregate score of 14-16, and “poor knowledge” by 13 or below. The mean value for practice related correct responses was 6.34.

The total possible score for practice was 14. “Good practice” was described by an aggregate score of 7-14 and “poor practice” by 6 or below.

Bivariate analysis was employed to check association between dependent and independent variables. Variables with p-value < 0.25 on bivariate analysis were entered to multivariate logistic regression model to identify the factors that affect knowledge and practice of mothers/caregivers on home management of under-five diarrhea. Statistical significance was declared at p-value <0.05. Finally the result was displayed using text, graphs and tables.

#### **4.11 Ethical consideration**

Ethical clearance was obtained from Ethical Review Board (ERB) of Jimma University College of Health Sciences. Official cooperation letter was obtained from Dawuro zone health department and Mareka woreda health office for representative kebeles to be cooperative for this study. Again cooperation letter was gained from the kebele representatives before starting data collection. Finally, oral consent was obtained from the participants after the purpose of the study clearly discussed. Also the respondents’ right to refuse or withdraw from participating in the interview was fully ensured and the information of each participant kept strictly confidential. Data collectors were oriented that if the child is sick with acute diarrhea during the time of data collection, referral to health facility or advice on home management is needed.

#### **4.12 Dissemination plan**

The findings of this study will be presented to Jimma University, distributed to Dawuro zone health department, Mareka woreda health office and other organizations who are interested on under-five diarrhea home management activities in Mareka woreda. The findings may also be presented in different seminars, meetings and workshops and published in a peer reviewed scientific journal.

### 4.13 Operational definition of terms

- ✚ **Oral Rehydration Therapy (ORT):-** is a way of giving extra fluids at home to prevent or treat dehydration.
- ✚ **Feeding in convalescence period (recuperation) also called catch up feeding:-** giving extra foods and fluids for two weeks after diarrheal episode.
- ✚ **Caregiver:** - any person involved in child care other than mother in the households and lived in the household for the preceding 6 months.
- ✚ **Knowledge** of mothers/caregivers in pediatric diarrheal diseases is labeled based on the response of respondents' knowledge on home management of diarrhea in under five children(9,15,25,30,33).
  - **Good knowledge-** total score above mean value ( $>13.43$ )
  - **Poor knowledge-** total score below mean value ( $<13.43$ )
- ✚ **Practice (performance)** in cases of pediatric diarrheal diseases is labeled based on the response of respondents' practice on oral rehydration, increased fluid consumption, continuation and increasing of breast feeding and feeding (9,15,25,30,33).
  - **Good practice-** total score above mean value ( $>6.34$ )
  - **Poor practice** - total score below mean value ( $<6.34$ )
- ✚ **Salt-sugar-solution:-** a homemade fluid composed of 1 liter water, 1 tea spoonful salt and 8 tea spoonful sugar.
- ✚ **Index child:-** in the household having more than one children aged less than 5 years, the youngest child was included in the study.
- ✚ **Dehydration:-** lose of a large amount of water and electrolyte from body.



## 5. Results

### 5.1 Socio-demographic characteristics of study participants

A total of 654 mothers of under- 5 children participated in the study making 91.2% response rate. Twenty four mothers/caregivers couldn't be found despite repeated visits and 39 were excluded from analysis due to incomplete information required in the questionnaire.

The mean age of respondents was  $26.9 \pm 4.6$  years while the mean age of the index children ranged from 6-11 months. The youngest respondent was 19 years of age while the oldest was 45 years of age. Majority (98.2%) of respondents belong to the Dawuro ethnic group. The religion of respondents was Orthodox (40.7%), Protestant (40.1%) and catholic (17.0%) respectively. Majority (74.6%) of the respondents were housewives, 37.5% had at least primary education and only 24.2% had acquired secondary and college education (Table 1).

Table 1 Socio-demographic characteristics of mothers/caregivers, Mareka woreda, 2015

Variable		Frequency (%)
Relationship of respondent to an index child	Mother	604(92.4)
	Caregiver	50(7.6)
Age of the mother/caregiver	Below 25 years	329(50.3)
	25 years & above	325(49.7)
Religion of mother/caregiver	Orthodox	266(40.7)
	Protestant	262(40.1)
	Catholic	111(17.0)
	Others	15(2.3)
Ethnicity of mother/caregiver	Dawuro	642(98.2)
	Amhara	11(1.7)
	Tigre	1(0.2)
Occupation	Housewife	488(74.6)
	Civil servant	77(11.8)
	Merchant	61(9.3)
	Student	28(4.3)
Educational status	No formal education	251(38.4)
	Primary education(1-8)	245(37.5)
	Secondary education(9-12)	64(9.8)
	College and above	94(14.4)

Concerning the residence of the respondents, 553 (84.5%) and 101 (15.5%) of the respondents were from rural and urban areas respectively. Regarding the number of children they have, mean number of living children in the household was found to be 2.28. The reported average family size in the household was  $5.67 \pm 2.33$  while the average household income was 756ETB (Table 2).

Table 2 Socio-demographic characteristics of mothers/caregivers and an index child, Mareka woreda, 2015

Variable		Frequency (%)
Residence	Rural	553(84.5)
	Urban	101(15.5)
Number of family members in HH	<=4	240(37)
	5-8	273(41.7)
	>8	141(21.6)
Number of living children in HH	<=2	381(58.3)
	3-4	246(37.6)
	>=5	27(4.1)
Monthly income of the HH	<750 ETB	387(59.2)
	>=750ETB	267(40.8)
Age of an index child	0-5 months	115(17.6)
	6-11 months	284(43.4)
	12-23 months	147(22.5)
	24-59 months	108(16.5)
Sex of an index child	Male	323(49.4)
	Female	331(50.6)
Birth order	First	157(24)
	Second	111(17)
	Third	39(6)
	Fourth and above	347(53.1)

## 5.2 Knowledge of mothers/caregivers

Of total respondents, 265 (40.5%) mothers said that there was an episode of childhood diarrhea during the last 2 weeks among their children. Mothers were asked about definition of diarrhea and diarrhea was defined as loose stool, increases in stool frequency and loose stool with blood by 49.2%, 24.2% and 13.3% mothers respectively. Twenty eight (4.3%) of the respondents agreed that diarrhea is a normal process when a child is growing up and due to toething period. Respondents also listed four danger signs necessitating the treatment of diarrhea outside home namely: passage of bloody/mucoid stool (227; 34.7%), diarrhea with fever (253; 38.7%), diarrhea with vomiting (100; 15.3%) and sunken eyes & fontanel (60; 9.2%) (Table 3).

Table 3 Respondents' knowledge on definition, causes and danger signs of diarrhea in children, Mareka woreda, 2015

Variable	Frequency	Percent (%)
Respondents' knowledge on definition of diarrhea N=654		
Passage of loose (watery) stool	322	49.2
Increase in stool frequency	158	24.2
Stool with blood	87	13.3
Stool with mucus	87	13.3
Diarrhea in children is a normal process N=654		
Yes	28	4.3
No	626	95.7
Why diarrhea is a normal process? N=28		
It occurs due to toething period	22	78.9
It is a sign of good growth	6	21.4
Respondents' knowledge on causes of diarrhea N=626		
Contaminated food/drink	183	29.2
Parasite infection	125	20.0
Bad eyes	31	5.0
False teeth	39	6.2
Unhygienic environment	71	11.3
Cooked and cold food	86	13.7
Mal-absorption/allergy to food/fluid	73	11.7
Unclean hands	18	2.9
Source of information about causes of diarrhea N=626		
Health facilities (clinics, health centers, hospitals)	494	79.0
Mass media	93	14.9
Relatives (family, friends)	39	6.2
Danger signs necessitating management of diarrhea outside home N=626		
Passage of bloody/mucoid stool	227	34.7
Diarrhea with fever	253	38.7
Diarrhea with vomiting	100	15.3
Sunken eyes and fontanel	60	9.2
Did your child experienced diarrhea in the past 2 weeks? N=654		
Yes	265	40.5
No	389	59.5

Respondents were asked about preferred oral fluid to be given to their children during diarrhea. The preferred fluids by the mothers were ORS (56.4%), breast milk (33.8%), salt sugar solution (3.1%) and rice water (2.6%) respectively. Concerning ORS, 517 (79.1%) of the respondents were aware of ORS. But only 133 (20.3%) of the respondents were aware of SSS. According to the evaluation of knowledge related responses, majority 438(67%) of mothers had good knowledge but the rest 216 (33%) had poor knowledge on home management of diarrhea in children (Table 4).

Table 4 Respondents' knowledge on types of diarrhea and preferred foods/fluids by mothers, Mareka woreda, 2015

Variable	Frequency	Percent (%)
How many times per day does he/she pass stool in the last episode? N=265		
Three or more times	231	87.2
Twice	28	10.5
Ones	6	0.2
Type of diarrhea N=265		
Mucoid	125	47.2
Watery	86	32.5
Bloody	54	20.4
For how long did the diarrhea persist?		
< 14 days	169	63.8
>14 days	96	36.2
Is diarrhea in children curable? N=654		
Yes	641	98
No	13	2
Type of diarrhea management mothers know N=654		
Drug therapy	342	52.3
ORT	249	38.1
Herbal medicine	56	8.6
Do not know	7	1.1
Oral fluids preferred to be given to children during diarrhea N=654		
ORS	369	56.4
Breast milk	221	33.8
Salt sugar solution	20	3.1
Rice water	17	2.6
Others	27	4.1
Do you know ORS? N=654		
Yes	517	79.1
No	137	20.9
Place from where ORS can be purchased N=517		
Public health facilities	492	75.2
Private clinic/pharmacy	19	2.9
Quacks	6	0.9
Do you know salt sugar solution? N=654		
Yes	133	20.3
No	521	79.7
Knowledge related correct response		
Good	438	67
Poor	216	33

### **5.3 Practice of mothers/caregivers**

The management options chosen by mothers to manage their child during diarrhea are giving leftover drugs 185(28.3%), treatment at health facilities 163(24.9), herbal medication 126 (19.3%), homemade fluids 98 (15%) and ORS 82 (12.5%) respectively. Diet during diarrhea is very important and 205 (31%) mothers said that diet should be decreased during diarrhea while 109 (16.7%) mothers said that diet should be increased and 221 (33.8%) were in favor of no change in diet.

Majority (70.3%) of the respondents supported sustained feeding (breast milk, solid and liquid food) during episodes of diarrhea in their children while 194 (29.7%) supported diet withdrawal. Such withdrawal was based on believing that foods prolong the duration of diarrhea in the child (28.9%), culture based reduction (53%) & foods induce vomiting /loss of appetite (13.4%).

Liquid diets (fluids) were the commonest type of food withdrawn by majority 158 (81.4%) of mothers. Sustained feeding for two consecutive weeks following diarrheal episode was supported by only 109 (16.7%) of mothers (Table 5).

Table 5 Respondents' practice on home management of diarrhea in children, Mareka woreda, March, 2015

<b>Variable</b>	<b>Frequency</b>	<b>Percent (%)</b>
Action taken to treat diarrhea by mothers N=654		
Used left over drugs	185	28.3
Took to health facility	163	24.9
Used herbal medicine	126	19.3
Used homemade fluids	98	15.0
Used ORS	82	12.5
Amount of fluids/foods given during diarrhea N=654		
The same as usual	221	33.8
Less than usual	205	31.3
More than usual	203	31.0
Did not give any fluid/food at all	25	3.8
Amount of fluids/foods given during convalescent period N=654		
The same as usual	366	56.0
Less than usual	143	21.9
More than usual	109	16.7
Did not give any fluid/food at all	36	5.5
Withdrawal of fluid/food improves diarrhea N=654		
Yes	194	29.7
No	460	70.3
Reason for withdrawal N=194		
Culture based	103	53.0
It reduces the duration of diarrhea	56	28.9
It stops vomiting	26	13.4
It increases appetite	8	4.1
Other	1	0.5
Type of fluid/food withdrawn N=194		
Liquids (fluids)	158	81.4
Breast milk	19	9.8
Solid foods	12	6.2
Others	5	2.6

Of the 466 respondents who were aware of ORS preparation, 338 (72.5%) mothers mentioned the correct procedure (i.e. 4 glasses of boiled & cooled water is required to prepare a packet of ORS) while 128 (27.5%) gave incorrect responses. Mothers were asked about the length of time that once prepared ORS should be used and more than half (54%) of them said that it should be used within 24 hours of its preparation but the rest (46%) mentioned it should be used for more than 24 hours.

Of the 133 respondents who were aware of homemade ORS also known as salt sugar solution (SSS) preparation, only 50 (37.6%) of them were able to mention the components correctly (that is 1 tea spoonful salt, 8 tea spoonful sugar and 1 liter clean water) while the rest 83 (62.4%) gave wrong response. According to the evaluation of practice related responses, 309(47.2%) participants had good practice and 345(52.8%) had poor practice (Table 6).

Table 6 Respondents' practice on home management of diarrhea in children using ORS & SSS, Mareka woreda, March, 2015

<b>Variable</b>	<b>Frequency</b>	<b>Percent (%)</b>
Do you know ORS preparation? N=517		
Yes	466	90.1
No	51	9.9
How ORS is prepared? N=466		
Correct ingredients	338	72.5
Less than correct ingredients	116	25.0
Greater than correct ingredients	12	2.6
For how long should the prepared ORS be used? N=466		
<24 hours	252	54.0
>24 hours	201	43.1
Do not know	13	2.8
Is ORS packet available at your home? N=466		
Yes	325	69.7
No	141	30.3
Fluid used for treatment of diarrhea other than ORS N=466		
Herbal medication	247	53.0
Gruel made of cereals	151	32.4
Cow milk	48	10.3
Salt sugar solution (SSS)	20	4.3
Do you know the preparation of SSS? N=654		
Yes	133	20.3
No	521	79.7
How SSS is prepared? N=133		
Correct ingredients	50	37.6
Less than correct ingredients	82	61.6
Greater than correct ingredients	1	0.8
Do you think that SSS treats diarrhea? N=654		
Yes	133	20.3
No	521	79.7
Practice related correct responses		
Good practice	309	47.2
Poor Practice	345	52.8

### **5.3 Factors affecting knowledge of mothers on home management of diarrhea**

In bivariate analysis, knowledge of respondents about home management of diarrhea was associated with socio-demographic factors such as educational status of the mother, occupation of the mother, residence, income of the family, number of family members, age of an index child, sex of an index child and birth order of an index child. But variables such as age, religion and ethnicity of the mother and number of children in the household were not associated with the level of knowledge (Table 7)



Table 7 Bivariate analysis of socio-demographic factors affecting knowledge of mothers on home management of diarrhea, Mareka woreda, 2015

Variable	Knowledge of mothers		Significance test	
	Good	Poor	COR (95%CI)	p-value
Residence of the mother				
urban	96 (14.7)	5 (0.8)	19.131 (7.667, 37.735)	0.000*
rural	277 (42.3)	276 (42.2)	1.0	
Educational status of the mother.				
Secondary and above ( $\geq 9$ )	123 (18.8)	35 (5.4)	4.760 (2.633, 8.605)	0.000*
Primary education or less ( $\leq 8$ )	250 (38.2)	246 (37.6)	1.0	
Occupation of the mother				
House wife	246 (37.6)	242 (37.0)	0.192 (0.072, 0.512)	0.001*
Others (merchant, student,..)	127 (19.4)	39 (6.0)	1.0	
Income of the family				
$\leq 750$ ETB	188 (28.7)	199 (30.4)	0.419 (0.302, 0.581)	0.000*
$> 750$ ETB	185 (28.3)	82 (12.5)	1.0	
Number of family members				
$\leq 4$	155 (23.7)	85 (13.0)	1.658 (1.162, 2.365)	0.000*
$> 4$	218 (33.3)	196 (30.0)	1.0	
Age of an index child				
Age $< 12$ months	252 (38.5)	147 (22.5)	1.762 (1.067, 2.910)	0.027*
Age $\geq 12$ months	121 (18.5)	134 (20.5)	1.0	
Birth order of an index child				
$\geq 3$	192 (29.4)	194 (30.0)	2.131 (1.060, 4.284)	0.034*
$< 3$	181 (27.7)	87 (13.3)	1.0	
Number of children in the household				
$\leq 2$	221 (33.8)	160 (24.5)	1.174 (0.850, 1.621)	0.331
$> 2$	152 (23.2)	121 (18.5)	1.0	
Sex of an index child				
Male	163 (24.9)	160 (24.5)	1.704 (1.246, 2.328)	0.001*
Female	210 (32.1)	121 (18.5)	1.0	
Age of the mother				
$\geq 25$ years	282 (43.1)	226 (34.6)	1.093 (0.645, 1.851)	0.742
$< 25$ years	91 (13.9)	55 (8.4)	1.0	

In multivariate logistic regression analysis, the most important variables predicting the knowledge of mothers were educational status of the mother, residence of the mother and sex of an index child (Table 8).

Table 8 Multivariate logistic regression analysis showing factors associated with mothers' knowledge, Mareka woreda, 2015

Variable	Knowledge of mothers		Significance test		
	Good	Poor	COR	AOR (95% CI)	p-value
Education of the mother					
Secondary and above ( $\geq 9$ )	123 (18.8)	35 (5.4)	4.760	3.280(1.281,8.390)	0.001*
Primary education or less ( $\leq 8$ )	250 (38.2)	246 (37.6)	1.0	1.0	
Residence of the mother					
urban	96 (14.7)	5 (0.8)	19.131	21.282(5.937,36.279)	0.001*
rural	277 (42.3)	276 (42.2)	1.0	1.0	
Occupation of the mother					
House wife	246 (37.6)	242 (37.0)	0.912	2.020(0.550,7.419)	0.289
Others (merchant, student,..)	127 (19.4)	39 (6.0)	1.0	1.0	
Age of an index child					
Age < 12 months	252 (38.5)	147 (22.5)	1.762	1.498(0.817,2.747)	0.191
Age $\geq 12$ months	121 (18.5)	134 (20.5)	1.0	1.0	
Birth order of an index child					
$\geq 3$	192 (29.4)	194 (30.0)	2.131	1.304(0.604,2.814)	0.499
< 3	181 (27.7)	87 (13.3)	1.0	1.0	
Sex of an index child					
Male	163 (24.9)	160 (24.5)	1.704	2.508(1.721,3.656)	0.001*
Female	210 (32.1)	121 (18.5)	1.0	1.0	
Family number in the household					
$\leq 4$	155 (23.7)	85 (13.0)	1.658	1.236(0.573,2.665)	0.589
> 4	218 (33.3)	196 (30.0)	1.0	1.0	
Average monthly income of household					
$\leq 750$ ETB	188 (28.7)	199 (30.4)	0.419	0.633(0.408,1.284)	0.142
> 750 ETB	185 (28.3)	82 (12.5)	1.0	1.0	

\*p-value < 0.05 was considered as statistically significant.

#### **5.4 Factors affecting practice of mothers on home management of diarrhea**

In the bivariate analysis, socio-demographic factors such as age of the mother, residence of the mother, occupation of the mother, education of the mother, income of the household and sex of an index child were associated with practice of mothers on home management of diarrhea in children (Table 9).

Table 9 Bivariate analysis of socio-demographic factors affecting practice of mothers on home management of diarrhea, Mareka woreda, 2015

Variable	Practice of mothers		Significance test	
	Good practice	Poor practice	COR (95%CI)	p-value
Age of the mother				
>= 25 years	259 (39.6)	249 (38.1)	6.535(6.385,6.744)	0.000*
< 25 years	50 (7.6)	96 (14.5)	1.0	
Residence of the mother				
Urban	218 (33.3)	335 (51.2)	13.984(7.121,27.461)	0.000*
Rural	91 (13.9)	10 (1.5)	1.0	
Occupation of the mother				
House wife	199 (30.4)	289 (44.2)	0.122(0.046,0.324)	0.000*
Others (merchant, student,..)	110 (16.8)	56 (8.6)	1.0	
Educational status of the mother				
Secondary and above (>= 9)	107 (16.4)	51 (7.8)	8.451(4.776,14.954)	0.000*
Primary education or less( <=8)	202 (30.9)	294 (45.0)	1.0	
Income of the household				
<750 ETB	128 (19.6)	259 (39.6)	0.235(0.168,0.328)	0.000*
>=750 ETB	181 (27.7)	86 (13.1)	1.0	
Number of family members in the household				
<=4	110 (16.8)	130 (20.0)	0.945(0.667,1.337)	0.748
>4	199 (30.4)	215 (32.9)	1.0	
Age of an index child				
Age < 12 months	201 (30.7)	198 (30.3)	1.239(0.750,2.047)	0.403
Age >=12 months	108 (16.5)	147 (22.5)	1.0	
Sex of an index child				
Male	169 (25.8)	154 (23.5)	0.668(0.491,0.909)	0.010*
Female	140 (21.4)	191 (29.2)	1.0	
Birth order of an index child				
>=3	173 (26.5)	213 (32.6)	1.057(0.542,2.060)	0.871
<3	136 (20.8)	132 (20.2)	1.0	
Number of living children in the household				
<=2	185 (28.3)	196 (30.0)	1.888(0.827,4.308)	0.131*
>2	124 (19.0)	149 (22.8)	1.0	

In multivariate logistic regression analysis, the most important variables predicting the practice of mothers were age of the mother, residence of the mother, educational status of the mother, monthly income of the household and sex of an index child. In contrast, no significant relationship was established among level of maternal practice and socio-demographic factors such as occupation of the mother and number of children in the household (Table 10).

Table 10 Multivariate logistic regression analysis showing factors associated with maternal practice, Mareka woreda, 2015

Variable	Practice of mothers			Significance test	
	Good practice	Poor practice	COR	AOR(95%CI)	p-value
Age of the mother					
>= 25 years	259 (39.6)	249 (38.1)	6.535	4.768(2.281,9.966)	0.000*
< 25 years	50 (7.6)	96 (14.5)	1.0	1.0	
Residence of the mother					
Urban	218 (33.3)	335 (51.2)	13.984	13.048(4.525,17.627)	0.000*
Rural	91 (13.9)	10 (1.5)	1.0	1.0	
Occupation of the mother					
House wife	199 (30.4)	289 (44.2)	0.122	1.196(0.323,4.422)	0.788
Others (merchant, student,..)	110 (16.8)	56 (8.6)	1.0	1.0	
Educational status of the mother					
Secondary and above (>= 9)	107 (16.4)	51 (7.8)	8.451	6.791(2.376,19.413)	0.000*
Primary education or less	202 (30.9)	294 (45.0)	1.0	1.0	
Income of the family					
<=750 ETB	128 (19.6)	259 (39.6)	0.235	0.477(0.322,0.708)	0.000*
>750 ETB	181 (27.7)	86 (13.1)	1.0	1.0	
Sex of an index child					
Female	169 (25.8)	154 (23.5)	0.668	0.653(0.453,0.942)	0.023*
Male	140 (21.4)	191 (29.2)	1.0	1.0	
Number of living children in the household					
<=2	185 (28.3)	196 (30.0)	1.888	1.304(0.604,2.814)	0.499
>2	124 (19.0)	149 (22.8)	1.0	1.0	

\*p-value <0.05 was considered as statistically significant

## 6. Discussion

The overall prevalence of childhood diarrhea among under-five children in this community was 40.5%, which is similar to the prevalence in other developing countries particularly in Kenya; Mugo (41.5%) (4). This finding is inconsistent with findings from India; Alighari (32%) (22), Kenya (87.1%) (25) and Pakistan (84.5%) (10). This difference might be due to socio-cultural differences among mothers in these countries.

According to the study finding, diarrhea was defined as loose stool, increase in stool frequency and loose stool with blood by 49.2%, 24.2% and 13.3% of mothers respectively. Similarly, the report from Pakistan revealed that 90%, 62% and 6.3% of respondents' defined diarrhea as loose stool increase in stool frequency and loose stool with blood respectively (20).

The most common causes of diarrhea as stated by mothers were contaminated food/drink (29.2%), parasite infection (20%), cooked & cold food (13.7%) and unhygienic environment (11.3%). Similarly, a study from Iran; Zahedan (16) revealed that mothers reported contaminated food/drink (52%) and unhygienic environment as the common causes of childhood diarrhea. A study from Kenya also reported contaminated food/drink (55%), unclean hands (36%) and parasite infection (29%) as the major causes of childhood diarrhea (25).

Knowledge about danger signs is important because it leads to early referral of very sick children. Failure to refer such children results in major complications or death. Respondents listed four danger signs necessitating the treatment of diarrhea outside home namely: passage of blood /mucoid stool (34.7%), diarrhea with fever (38.7%), diarrhea with vomiting (15.3%) and sunken eyes & fontanel (9.2%). These danger signs were also highlighted by study conducted in Iran; Zahedan (16) where sunken eyes & fontanel (59.7%), diarrhea with vomiting (23.7%) and passage of blood/mucoid stool (16.3%) were mentioned as major danger signs. Moreover, this result is supported by finding from Nigeria (18) in which passage of blood/mucoid stool (30.4%), diarrhea with fever (18.1%) and diarrhea with vomiting (24.6%) were mentioned as major danger signs.

Food withdrawal leads to weight loss, growth faltering and aggravates any existing malnutrition. It also delays the repair of the damaged intestinal lining and the return of its ability to produce certain digestive enzymes. In this study, majority (70.3%) of the respondents supported sustained feeding (breast milk, solid and liquid food) during episodes of diarrhea in children while significant number 194 (29.7%) of respondents supported diet withdrawal. Such withdrawal was based on believing that foods prolong the duration of diarrhea in children (28.9%), culture based reduction (53%) & food induces vomiting (13.4%). Liquid diets (fluids) were the commonest type of food withdrawn by majority (81.4%) of mothers. Similarly, studies carried out in different countries reported withdrawal of liquid diets as an important measure to control diarrhea: Ethiopia; Arbaminch (31%) (9), Nigeria (45.7%) (18), Nigeria (71.2%) (19) and India; Alighari (49.3%) (22).

According to the Integrated Community case Management of Childhood Illness (ICCM) strategy, caregivers at home should have adequate knowledge about the causes and treatment of diarrhea using appropriate remedies including home-made fluids such as porridge, fresh fruit juices, milk, salt/water solution and breast milk but not herbs. Meanwhile a child should be closely observed for any signs of dehydration following which urgent referral is made. In this study, the management options used by mothers to manage their children during diarrhea were giving leftover drugs (28.3%), treatment at health facilities (24.9%), herbal medication (19.3%), homemade fluids 98 (15%) and ORS (12.5%) respectively. However, similar study in Nigeria (18) revealed that mothers used treatment at health facility (32.9%), ORS (54.8%) and homemade fluids (6.0%) respectively as an important measure to control diarrhea. In addition, treatment at health facilities (45.3%), herbal medication (7.7%) and homemade fluids (13.4%) were the management options used by mothers as reported by the study conducted in Kenya (25).

Respondents were asked about preferred oral fluids to be given to their children during diarrhea. ORS (56.4%), breast milk (33.8%), salt sugar solution (3.1%) and rice water (2.6%) were the preferred fluids by the mothers. This result is in line with finding from Ethiopia; Arbaminch (9) in which ORS (40%) and salt sugar solution (29.4%) were the preferred fluids. Also in Kenya, mothers preferred to give ORS (13.4%) and salt sugar solution (15%) to their children during the episode of diarrhea (25).

Integrated Community case Management of Childhood Illness (ICCM) strategy recommends that uncomplicated diarrhoea could be managed successfully at home by continuing to feed the child, offering more fluids and administering Oral Rehydration Solution (ORS) correctly. These interventions could reduce child deaths by up to 40%. It is therefore required that a child's feeds are increased during illness in order to help the body fight the offending organisms. Due to the likely loss of appetite, the feeds should be appetizing and nutritious and given in small frequent amounts according to the child's ability to tolerate(34).

Home care practices of mothers during diarrheal episode were assessed in the current study and 205 (31%) mothers supported that diet should be decreased during diarrhea. This is much lower when compared to reports from India (42.4%) (10), Pakistan (43%) (20) and Nigeria (64.5%) (18) but higher when compared to the report from Kenya (10%) (25). This difference might be attributed to culture differences between countries and differences in knowledge level among mothers in these countries.

It is also recommended that during convalescence period, the feeds should be increased to help the body develop new cells to replace the ones worn out during illness. Sustained feeding for two consecutive weeks following diarrheal episode was supported by only 109 (16.7%) of mothers in this study. Similarly, the study carried out in Kenya demonstrated that 22.4% of mothers supported feeding during convalescence period (25).

The knowledge of mothers was also assessed about the recognition, use and preparation of ORS. Majority 517 (79.1%) of mothers were aware of ORS. Similar findings were observed in studies from Iran (79%) (17), Nigeria (85%) (18), Pakistan (90%) (20) and India (72%) (22). This finding is high when compared to report from Kenya (17.25%) (4). This difference might be due to the time gap between the two studies conducted (2007 and 2015) in which more information about ORS could be shared in current study area.

Out of the 466 respondents who were aware of ORS solution preparation, 338 (72.5%) mothers were able to explain the correct method of its preparation (i.e. 4 glasses of boiled and cooled water is required to prepare a packet of ORS). Similar findings were observed in studies from India (76.7%) (13), Nigeria (60.3%) (18) and Pakistan (74.5%) (20).



The length of time that once prepared ORS solution should be used is also important and a significant proportion 252 (54%) of respondents explained that ORS solution should be used within 24 hours of preparation. This is low when compared to reports from studies conducted in India (77.5%) (13) and Pakistan (87.4%) (20). This difference might be due to lack of adequate information provision while prescribing and selling ORS.

Of the 133 respondents who were aware of homemade ORS also known as salt sugar solution (SSS) preparation, only 50 (37.6%) of them were able to mention all the components correctly (that is 1 tea spoonful salt, 8 tea spoonful sugar and 1 liter clean water). This result is higher when compared with findings from studies carried out in India (4.1%) (13), Pakistan (14.5%) (20) and South Africa (12.5%) (24) but lower when compared with result from Nigeria (67.2%). This difference might be due to lack of prior experience and lack of awareness about the concerned materials needed for its preparation.

Mothers with secondary and above education had better knowledge on home management of under five diarrhea when compared to mothers with lower education. Similar finding was observed from studies conducted in different countries in which better educated mothers had good knowledge: India (10) [ $X^2 = 168$ ,  $p < 0.05$ ], Nigeria (18) [ $X^2 = 12.5$ ,  $p < 0.05$ ] and Nepal (21) [ $X^2 = 6.325$ ,  $p < 0.05$ ]. This might be due to the role of education of mothers to care for the health of their children.

Similarly, in this study, being aged 25 years and above was found to be strongly associated with better practice of mothers on home management of diarrhea in children. This finding is consistent with the study carried out in India (10) [ $X^2 = 479$ ,  $p < 0.05$ ].

Also education was found to influence the practice of mothers. Mothers educated secondary and above had better practice when compared to mothers with lower education. Similar finding was observed in studies conducted in Iran (16) and Nigeria (18).

This study revealed significant difference between sex of an index child and maternal practice. Mothers of female children practice 35% less likely when compared to mothers of male children. This finding is in line with finding from Arbaminch (9) where mothers of female children practice poor when compared to those with male children. This might be due to preferences to sex in different cultures and social values to male.

Mothers living in urban area had 13 times better practice on home management of diarrhea when compared to mothers living in rural areas. Similar finding was observed in Nigeria (15) in which urban mothers practice better than their counterparts. This might be due to the fact that women in rural area might not have access to information on ORS and differences in their life styles.

The overall knowledge level among respondents in this study was good (67%) and poor (33%) respectively. The report from India; Aligarh (22) showed 78% of respondents had good knowledge. Conversely, the overall practice level among respondents in this study was good (47.2%) and poor (52.8%) respectively. Similarly, the study from Tibriz University; Iran reported the level of practice among mothers as good (48%) and poor (52%) respectively (17).

### **Strength and limitation of the study**

**Strength:** This study is a community based study; primary data was collected using local language which enhances quality of information obtained.

**Limitation:** Mothers might have over reported recent diarrhea occurrence because they were unsure if it has stopped or because they might think their children could receive medical attention through the survey.

## **7. Conclusion and recommendation**

### **7.1 Conclusion**

The present study revealed that there is a wide gap in the knowledge and practice of mothers regarding home based management of under five diarrhoea. Out of 654 mothers interviewed, 516 (79.1%) mothers knew that they should use ORS and of this number, 338 (72.5%) could correctly prepare ORS; 133 (20%) knew about sugar salt solution and of this number, only 50 mothers mentioned correct method of its preparation. 194 (29.7%) of mothers supported diet withdrawal during episodes of diarrhea in children and liquid diets (fluids) were the commonest type of diet withdrawn by majority of mothers/caregivers. Sustained feeding for two consecutive weeks following diarrheal episode was supported by only 109 (16.7%) of mothers in this study.

Socio-demographic factors such as educational status of the mother, residence and sex of an index child were found to be significantly associated with knowledge of mothers/caregivers on home management of under five diarrhea where as maternal age, educational status, residence and sex of an index child were found to be significantly associated with practice of mothers/caregivers on home management of under five diarrhea.

## **7.2 Recommendation**

Based on the study findings, for further improvement in knowledge and practice of mothers/caregivers on home management of diarrhea in children, the following recommendations are forwarded.

### **For Woreda health office and zone health department:**

- ❖ Information, education, communication and empowering mothers is essential and could help them in increasing knowledge and practice on skilled management of under five diarrhea at home and decision making regarding the health of their children.
- ❖ Raise awareness on the importance and benefits of ORS and homemade fluids through designing messages that target on the involvement of the community to enhance the Community Integrated Management of Childhood Illness (C-IMCI) strategy. Thus, if the options about home based management and ORS in cases of acute diarrhoea are clearly percolated in the community, not only the visits to the health facility could be minimized as a short term effect but also the reduction in morbidity and mortality of under fives due to acute diarrhoeal diseases as a long term goal could be achieved.

### **For health care workers:**

- ❖ All health workers need to put more effort to encourage mothers about sustained feeding of their children with home available foods (porridge, fresh fruit juices, milk, salt sugar solution and breast milk) during diarrheal episodes.

### **For researchers:**

- ❖ A further qualitative study to establish knowledge and practice of mothers on home management of diarrhea in under five children would strengthen strategies for improving the well being of children.

## References

1. College of pediatrics. Guidelines on the management of acute diarrhoea in children. Malaysia; 2011.
2. Godana W, Mengistie B. Determinants of acute diarrhoea among children under five years of age in Derashe District, Southern Ethiopia; 2013: 1–11.
3. Professor Farthing M. et. al. Acute diarrhea in adults and children : a global perspective. world gastroenterology; 2012.
4. Nakuru A. Diseases Component I Policy. Mother ' s knowledge and practice of home care management of diarrhoea and risk factors in under 5 years in Nakuru, Kenya; 2010.
5. WHO,UNICEF. Behavior Change Perspectives and Communication Guidelines on Six Child Survival Interventions. WHO, UNICEF; 2012: 59–60.
6. FMOH. National strategy for child survival. Ethiopia; 2012.
7. WHO, UNICEF. Diarrhoea : Why children are still dying and what can be done. WHO, UNICEF; 2009.
8. Central Statistics Agency, Addis Ababa. Ethiopia Demographic and Health Survey.Ethiopia; 2012.
9. Mohammed S. The Occurrence of Childhood Diarrhea and its Home Management among Mothers of Under-Five Years Children in Arba Minch Zuria, Southern Ethiopia; 2013.
10. Choube A, Bahal SP, Srivastava A, Sharma M. Knowledge and child care practices regarding childhood diarrhoea- A cross sectional study. India; 2014: 26-33.
11. Talebian A. knowledge of mothers in management of diarrhoea, Kahsan, Iran; 2013.
12. Olgular A, Yakla A. Maternal Practice on Management of Acute Diarrhea among Children Under Five Years Old in Kosova. 2009; 8(5):369–372.
13. Saurabh S, Shidam UG, Sinnakirouchenan M, Subair M, Hou LG, Roy G. Knowledge and practice regarding oral rehydration therapy for acute diarrhoea among mothers of under-five children in an urban area of puducherry , India; 2014; 5(1):100–114.
14. Amini-ranjbar S, Bavafa B, Province K. Iranian Mother ' s child feeding Practices during diarrhea : A Study in Kerman, Iran; 2007; 6(3):217–219.
15. Asakitikpi AE. Acute diarrhoea : Mothers ' Knowledge of ORT and Its Usage in Ibadan Metropolis , Nigeria; 2010; 4(2):125–130.

16. Khalili M, Mirshahi M, Zarghami A, Rajabnia M. Maternal Knowledge and Practice Regarding Childhood Diarrhea and Diet in Zahedan , Iran; 2013; 2(1).
17. Abdinia B. Knowledge and Practice of mothers in the management of children's diarrhea, in Northwest Iran; 2014.
18. Olakunle JM, Buhari M. Assessment of mothers ' knowledge of home management of childhood diarrhea in a Nigerian setting; 2012; 1(4):168–184.
19. Akinyele OB. Knowledge and belief of nursing mothers on nutritional management of acute diarrhoea in infants, Ibadan, Nigeria; 2010;10(3).
20. Zahid S, Zehra N, Ullah S, Khan N, Javed H, Khan M. Mother ' s awareness and practices regarding home management of childhood diarrhea in a Squatter Settlement of Karachi, Pakistan; 2014;3(02):3–8.
21. Ansari M, Izham M, Ibrahim M, Shankar PR. A survey of mothers ' knowledge about childhood diarrhoea and its management among a marginalised community of Morang , Nepal; 2011:474–479.
22. Shah MS, Ahmad A, Khaliq N, Khan Z. Do the mothers in rural Aligarh know about home based management of acute diarrhoea ? India; 2011;3(2):76–80.
23. Sultana A, Riaz R, Ahmed R, Khurshid R. Knowledge and Attitude of Mothers Regarding Oral Rehydration Salt. Rwanda; 2010;14(2):109–111.
24. ML Coke et.al. Diarrhoea and risk factors in children with acute diarrhoea in urban hospital, Cape town, South Africa; 2013.
25. Doreen M. Othero. Home management of diarrhoea among underfives in a rural community, household preception and practice, 2008. Kenya: East African Journal of Public Health, East African Public Health Association; 2008: 142–146.
26. National strategy for child survival, FMOH, Addis Ababa; 2005.
27. Mohammed S, Tamiru D. The burden of diarrheal diseases and associated risk factors among children under five years of age in Arba Minch district , Southern Ethiopia: A Cross-Sectional Study.Ethiopia; 2014.
28. Seyoum S, Wencheke E. Determinants of mortality among one to four years old children in Ethiopia : A study based on the 2011 EDHS data; 2011.
29. Ayele Mamo, Hailu A. Assessment of Prevalence and Related Factors of Diarrheal Diseases among Under-Five Year ' s children in Debrebirehan referral hospital , Debrebirehan town , North Shoa. Ethiopia; 2014 :1–14.

30. Muluken Desalegn, Abera Kume. Predictors of under-five childhood diarrhea : Mecha District , West Gojam, Ethiopia; 2009:3–4.
31. Mengistie B, Berhane Y, Worku A. Predictors of Oral Rehydration Therapy use among under-five children with diarrhea in Eastern Ethiopia: a community based case control study. Ethiopia; 2014;12(1):1029.
32. Population and Census Commission. Summary and Statistical Report of the 2007 Population and Housing Census Results. Addis Ababa, Ethiopia; 2008.
33. Mengistie B, Berhane Y, Worku A. Prevalence of diarrhea and associated risk factors among children under-five years of age in Eastern Ethiopia : A cross-sectional study. 2013;3(7):446–453.
34. UNICEF,WHO. WHO / UNICEF joint statement. Integrated Community Case Management an equity-focused strategy to improve access to essential treatment services for children. WHO / UNICEF; 2012.

## **Annexes**

### **Questionnaire**

#### **English version questionnaire for individual interview**

Informed Consent Form for Quantitative survey questionnaires:

My name is -----. I am working as a data collector temporarily for post graduate student of Jimma University College of Health Science. The objective of the present study is to assess knowledge and practice of mothers/care givers on home management of diarrhea in under- five children.

During the interview you will be asked some short questions. Your answers will be recorded on a survey questionnaire. No personal identifiers will be attached/ recorded to the interview. All the data obtained will be kept strictly confidential by using only code numbers.

Your participation in the study is upon purely voluntary basis. The interview will be conducted individually and will take 20-30 minutes. During the interview (discussion) period, if you feel inconvenient, you can interrupt and clarify inconvenience, appoint to other time or even withdraw any time after you get involved in the study. Your honest and genuine participation in responding to the questions prepared is very important & highly appreciated. If you agree to participate in this study I will interview you.

Would you be willing to participate? Yes  No

If yes, proceed. If no, thank and stop here. \_\_\_\_\_ (Signature of interviewer certifying that respondent has given Informed consent verbally).



**General instruction: Circle the correct number which contains the answer from answer box or put the answer on the space provided.**

Interviewer name: \_\_\_\_\_ Interviewer code: \_\_\_\_\_

Date: \_\_/\_\_/\_\_\_\_ Kebele name: \_\_\_\_\_ HH code: \_\_\_\_\_

**Part I: Questions on socio-demographic and socio-economic characteristics of mothers/care givers.**

Q#	Question	Option	Skip to Q#
1	Relation of the respondent to the index child	Mother-----1 Care giver-----2	
2	Age of the mother/care giver in years	-----years old	
3	Marital status of the mother	Married-----1 Divorced-----2 Widowed-----3 Single-----4	
4	Religion	Orthodox-----1 Muslim-----2 Protestant-----3 Catholic-----4 Other specify----88	
5	Ethnicity	Dawuro-----1 Oromo-----2 Amhara-----3 Tigre-----4 Other specify----88	
6	Occupation	House wife-----1 Civil servant-----2 Merchant-----3 Farmer-----4 Daily labors-----5 Student-----6 Other specify----88	

7	Educational status of the mother	No formal education-----1 Primary education (1-4)-----2 Primary education (5-8)-----3 Secondary education (9-12)---4 college and above-----5	
8	Educational status of the father	No formal education-----1 Primary education (1-4)-----2 Primary education (5-8)-----3 Secondary education (9-12)-4 college and above-----5	
9	Residence of the parent	Rural-----1 Urban-----2	
10	Number of family living together in HH?	In number _____	
11	Number of living children?	In number _____	
12	Estimated monthly income of the family in ETB?	-----Birr	

## Part II. Socio-demographic characteristics of index child

In the next sets of questions, I am going to ask some questions about your child.

Q#	Question	Codes	
1	Age of an index child	0-5 month-----1 6-12 month-----2 12-23 month-----3 24-59 months----4	
2	Sex of an index child	Male-----1 Female----2	
3	Birth order	First-----1 Second-----2 Third-----3 Fourth and above-4	
4	Measles vaccination	Yes---1 No --2	
5	Rota vaccination	Yes---1 No ---2	

**Part III. Questions to assess knowledge of mothers/care givers on diarrheal disease and its management at home**

Q#	Question	Options	
1	What do you think diarrhea is?		
1.1	Passage of loose(watery) stool	Yes-----1 No -----2	
1.2	Increase in stool frequency	Yes----1 No -----2	
1.3	Loose stool with blood	Yes ----1 No -----2	
1.4	Loose stool with mucus	Yes ----1 No -----2	
2	Diarrhea in children is a normal process.	Agree-----1 Do not agree-----2	→Q3 →Q4
3	If your answer to Q2 is "agree", why it is normal?	Occurs due to child teething period-----1 It is a sign of good growth-----2 Other/ specify----- 88	
4	If your answer to Q2 is No, what is its cause?	Contaminated food-----1 Contaminated drink-----2 Worm infestation-----3 Bad eyes-----4 False teeth-----5 Unhygienic environment-----6 Cooked and cold food-----7 Un clean hands-----8 Sugar and sugary foods-----9 Mal-absorption/allergy to food-----10 Other diseases such as common cold-----11 Other/specify-----88	
5	From whom did you hear about diarrhea?	Mass media-----1 Relatives (family, friends)---2 Health facility-----3 Other/specify-----88	
6	What are the signs/symptoms necessitating treatment of diarrhea outside home (danger signs)?	Passage of mucous /bloody stool-----1 Diarrhea with fever-----2 Diarrhea with vomiting -----3 Excessive thirst and restlessness-----4 Sunken eyes and fontanel-----5 Excessive drowsiness & weakness----6 Unconsciousness-----7 Diarrhea lasting > 3 days-----8 Reduced urine output-----9 Loss of appetite-----10	

#	Questions	Options to answerer
7	Did your child experienced diarrhea in the past 2 weeks?	Yes ----1 No-----2
8	How many times per day does he/she pass stool in the last episode?	Ones----- 1 twice-----2 three or more--3
9	What type of diarrhea did he/she pass in the last episode?	Watery ---- 1 Bloody -----2 mucous-----3
10	For how long did the diarrhea persist?	< 14 days----- 1 >14 days-----2
11	Is diarrhea in children curable?	Yes----1 No----2
12	What type of diarrhea management do you know?	Drug therapy----- 1 ORT-----2 Herbal medicine-----3 Nutritional management--4 Do not know-----5
13	Preferred oral fluids to be given to your child	Breast milk-----1 ORS (WHO)-----2 Fresh/powdered milk----3 Salt sugar solution-----4 Mashed food-----5 Rice water-----6 Tea-----7 Other/specify-----88
14	Do you know ORS?	Yes ----1 No -----2
15	From where can ORS be obtained?	Public health post/health center/hospital---1 Private pharmacy/clinic-----2 Quacks(unqualified practitioners)-----3 Do not know-----4
16	Do you know salt sugar solution (SSS)?	Yes-----1 No -----2

**Part IV: Questions on practice of mothers on home management of diarrhea**

Q#	Question	Option	
1	What did you do for your child during the diarrheal episode?	Anti-diarrheal agents----1 ORS-----2 Homemade fluids-----3 Herbal medicines-----4 Left over drugs-----5 Took to health facility--6 Nothing done-----7	
2	How much fluid/food have you provided to your child during diarrheal episode?	Drunk the same as usual----1 Drunk less than usual-----2 Drunk more than usual-----3 Did not drink at all-----4 Eat the same as usual-----5 Eat less than usual-----6 Eat more than usual-----7 Did not eat at all-----8	
3	How much fluid/food have you provided to your child during convalescence period?	Drunk/ate the same as usual-1 Drunk/ate less than usual---2 Drunk/ate more than usual---3 Did not drink/eat at all-----4	
4	Do you think that withdrawal of fluid/food/ improves diarrhea?	Yes-----1 No-----2	→ Q5 → Q6
5	If yes to Q4, what is your reason?	Culture-based reduction-----1 It reduces the duration of diarrhea-----2 It stops vomiting-----3 It increases appetite-----4 Other/specify-----88	
6	Types of food/fluid withdrawn	Breast milk-----1 Liquid foods (ORS, gruel, SSS etc)--2 Solid foods-----3 Others/specify-----88	
7	Do you know the preparation of ORS?	Yes-----1 No-----2	→ Q8 → Q9
8	If your answer to Q7 is yes, how ORS is prepared (see the materials used for measurement)?	1liter clean water & 1sachet ORS-----1 Less than 1liter clean water with 1 sachet ORS-----2 Greater than 1 liter clean water with 1 sachet ORS-----3	
9	For how long should the prepared ORS be used?	< 24 hours-----1 >24 hours-----2 Do not know----3	
10	Is ORS packet available at your home?	Yes-----1 No-----2	

11	What fluid other than ORS did you use for treatment of diarrhea at home?	Cow milk-----1 Gruel made of cereals-----2 Sugar salt solution(SSS)----3 Other/specify-----88	
12	Do you know the preparation of salt sugar solution (SSS)?	Yes-----1 No-----2	→ Q13 → Q14
13	If yes to Qn12, how it is prepared?	1 tsf salt, 8 tsf sugar, 1L water---1 Less than this level -----2 Greater than this level-----3 Incorrect preparation-----4	
14	If no to Qn12, do you think that it is important to treat diarrhea?	Yes-----1 No-----2	

Date of Data collection \_\_\_\_\_

Name of Data collector \_\_\_\_\_

Code of Data collector \_\_\_\_\_

Signature of Data collector \_\_\_\_\_

Name and signature of supervisor \_\_\_\_\_



7	Atti Timrte detha	Tamiribenawa-----1 Koyiro detha (1-4)-----2 Koyiro detha (5-8)-----3 La7etha detha (9-12)-----4 Collegene bolla-----5	
8	AwuaTimrte detha	Tamiribenawa-----1 Koyiro detha (1-4)-----2 Koyiro detha (5-8)-----3 La7etha detha (9-12)-----4 Collegene bolla-----5	
9	Kethani de7eya assa payidowa?		
10	Natu payidowa?		
11	Agenan demiya birra qoda?		
12	De77ia herra qommua	Katamma-----1 Gaxxaria-----2	

### La77etho Bagga: Qerri nana бага oshsha

Q#	Oshsha	dorruwua	adha
1	Na77aw/nattu affu agene?		
2	Matumatetha	Attumawa-----1 Machano-----2	
3	Hinto affuntha na77e?	Koyrua-----1 La77ethua-----2 Hezethua-----3 Oydethuane hewape bolla-----4	



**Hezenthoo Baga: Errana oyqettedda oshshatua**

Q#	Oshsha	doruwa	adha
1	Qerri nana gussu ay malla sake?		
1.1	Hatha melatiya kadha.	E77e ----- 1 Gidenna-----2	
1.2	Chorra gedde utisiya kadha	E77e ----- 1 Gidenna-----2	
1.3	Sutha utisiya kadha	E77e ----- 1 Gidenna-----2	
1.4	Gisha utisiya kadha	E77e ----- 1 Gidenna-----2	
2	Qerri nanna gussu paxatetha malata.	E77e -----→ Gidenna-----→	Qn 3 Qn 4
3	Hewento ayana oyqettide yi?	Matha achchana----- 1 Nana dichchana-----2 Harrabana -----88	
4	Hewa gidenento wotti yi?	Hambalacheteda qummana ----- 1 Hambalacheteda hathana-- ---2 Ullo gido guxuniyana----3 Aypiya ittana-----4 Herra ittana-----5 Ka772 gam7a qumana---6	
5	Hinte hewa oppe sissedite?	Irraduappene televisioniappe----- 1 Dabbo assape -----2 Akimatuwappe -----3 Harassape-----88	
6	Gussua sakuan loithi hirgethia malatatu ayate?	Sutha/gisha kadhayoppe -- ----- 1 Qoxu de77ope-----2 Choshay de77ope -----3 Loythi sammetope-----4 Liphine aypine wullope----5 Barena doggope-----6	
7	Adheda la77u geyan gussua saketede/saketade?	E77e ----- 1 Gidenna-----2	

8	Itti galasi appun gede kadhayi/utissi?	Itti gede-----1 La77u gede-----2 Hezzuanne hewappe bolla- -3	
9	Kadhay aya malati?	Hatha-----1 Sutha-----2 Gisha-----3	
10	Sakku appu galasa gam77ede?	<14 galassa-----1 >14 galassa-----2	
11	Qerri nana gussu paxiya sake?	E77e ----- 1 Gidenna-----2	
12	Wotti paxi?	Dhaliya akina-----1 Sonni ushshiya banni----2 Erancha dhaliyani-----3 Qumm mizzuanni-----4 Tani errike-----5	
13	Donnana immetana koshiyawe aye?	Dhantha-----1 ORS-----2 Matha-----3 Soni gige da ba----4 Erancha dhaliya---5	
14	ORS getetiyawa erray?	Erray-----1 Errike-----2	
15	Haqappe shametti?	Mangistiya akime kethape- ----1 Gille akime kethappe----2 Suqiyappe-----3 Tani errike-----4	

**Oydentho Baga: ossuana oyqettia oshshatua**

Q#	Oshsa	doruwa	adha
1	Na77ay/natta gussowani aya immeditte?	Gussua essiyaba-----1 ORS-----2 Soni giggeda ushiyaba-----3 Erancha dhaliya-----4 Harodepe atteda dhaliya---5 Akime gole appadi-----6 Ayne uda beyki-----7	
2	Ushiyabay/miyabay harodewappe dare/lappe?	Harodewa kena-----1 Harodewape dara-----2 Harodewape lappa-----3 Ayne miza/usha beyki-----4	
3	Sakku bashinade woysa kena miyaba/ushiyaba emmeditte?	Harodewa kena-----1 Harodewape darua-----2 Harodewape lappa-----3 Ayne miza/usha beyke-----4	
4	Miaba/ushiaba digiyawe sakua kekissi?	E77e ----- 1 Gidenna-----2	→Qn 5 →Qn 6
5	Hewo gassu aye?	Woganna oyqette-----1 Sakua kekisse-----2 Chosha esse-----3 Nappisa doyye-----4 Harra baw lo77a-----5	
6	Ay qommo qumma/ushsha diggedite?	Dhantha-----1 Ushiyaba- -----2 Miyaba-----3	
7	ORS getetiyawa errite?	E77e-----1 Errike-----2	→Qn 8 →Qn 9
8	ORS wotteti giggi?	Itti jokiyathathane itt kartoninne walakette-----1 Itti jokiyappe lappa hathana-----2 Itti jokiyappe daro hathana-----3	
9	Itti gede gigiso ORS woisa satiyann emmetana koshi?	< 24 satiya-----1 >24 satiya-----2 Tani errike-----3	
10	Ha7i hinte soni ORS de77i?	De77e-----1 Bawa-----2	
11	Hewappe haray hinte sako immiyawe aye?	Miya matha-----1 Kathappe gigiyaba-----2	

		Sonni gigiya ushiyaba-----3 Hara baa-----88	
12	Soni gigiya ushiyaba errite?	E77e-----1 Errike-----2	→ Qn 13 → Qn 14
13	Sonni gigiya ushetiyabay wotteti gigi?	Itti manka maxini,8manka sukarine 1jokiya hathape -----1 Hewape lappani-----2 Hewape darruni-----3	
14	Hinte qofan son gige da qumay nanaw loythi madi?	E7ee made-----1 Ayne madena-- -----2	

Oshshayi kumeda galassa\_\_\_\_\_

Oshsha kunthida assa suntha\_\_\_\_\_

Oshancha Malata\_\_\_\_\_

Kushe malata\_\_\_\_\_

Kaliyawa sunthane kushe mlata\_\_\_\_\_

**Galattay!**