

**Original Research Article**

# **A study on knowledge, attitude and practices of mothers about acute diarrhea and its management with oral rehydration therapy and zinc in children under 5 years**

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## **Abstract**

**Background:** Diarrhea and its complications remain a major cause of morbidity and mortality in children, especially in developing countries. It is the second most common cause of death in children under 5 years of age worldwide and is responsible for 2.4 million deaths annually. Diarrhea is dangerous because of dehydration which has been estimated to account for 16% of under-five mortality and 3% of neonatal mortality globally. Diarrheal diseases also cause malnutrition. Children with severe malnutrition and diarrhea have high mortality rate. Studies indicate that diarrhea can also lead to long-term physical impairments such as stunted growth and reduced intellectual development. **Aim of the study:** To find the association between the knowledge, attitude, and practices of ORT with selected demographic variables.

**Materials and methods:** This was hospital-based cross-sectional study. Mothers accompanying children under 5 years of age with acute diarrhea, attending the OPD in Institute of Child Health and Hospital for Children, Egmore, Chennai in the year 2019 were included. Knowledge showed the understanding of diarrhea, ORT, and Zinc. Attitudes correspond to feelings regarding diarrhea, ORT,

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and Zinc. Practices refer to people's hygiene practices, their health-seeking behavior, feeding practices, use of ORT, and Zinc was analyzed.

**Results:** Among the study group 94% (199) of mothers got health education about diarrhea 6% (12) of mothers did not get any health education. Knowledge of diarrhea among mothers had been assessed based on their ability to tell about the understanding of diarrhea, causes, modes of spread of infection, predisposing factors, danger signs, and dehydration.

**Conclusion:** ORT and Zinc therapy during diarrhea and diarrheal disease preventive strategies can be up scaled through existing infrastructure by information, education and communication activities and introduction of its training component.

## Key words

Diarrhea, Parents' knowledge, Oral rehydration therapy, Zinc supplement.

## Introduction

Diarrhea remains the second leading cause of child death around the world. Diarrhea is a common symptom of gastrointestinal infections caused by a wide range of pathogens, including bacteria, viruses, and protozoa [1]. Most pathogens that cause diarrhea share a similar mode of transmission from the stool of one person to the mouth of another. This is known as fecal-oral transmission. The two most important consequences of diarrhea in children are malnutrition and dehydration. Malnutrition and diarrhea form a vicious cycle since malnutrition increases the risk and severity of diarrhea [2]. Significant dehydration with abnormal electrolyte and acid-base status occurs in 2 – 5% of all cases of diarrhea, which may be fatal. Management of acute diarrhea has four major components: 1) Rehydration and maintaining rehydration; 2) Ensuring adequate feeding; 3) Oral zinc supplementation; 4) Early recognition of danger signs and treatment of complication. Diarrheal disease control is an essential and effective investment in reaching MDG 4 (Reduction of children mortality) [3]. Diarrhea is best defined as excessive loss of fluid and electrolytes in the stool. WHO defines: Diarrhea as the passage of three or more loose or liquid stools per day (or more frequent passage than is normal for the individual) [4]. Frequent passing of formed stools is not diarrhea, nor is the passing of loose, "pasty" stools by breastfed babies. Nelson's textbook of Pediatrics defines Acute diarrhea as sudden onset of excessively

loose stools of >10 mL/kg/day in infants and >200 g/24 hr in older children, which lasts <14 days. When the episode lasts >14 days, it is called chronic or persistent diarrhea. Dysentery is defined as small volume, frequent bloody stools with mucus, tenesmus, and urgency [5].

## Materials and methods

This was hospital-based cross-sectional study. Mothers accompanying children under 5 years of age with acute diarrhea, attending the OPD in Institute of Child Health and Hospital for Children, Egmore, Chennai in the year 2019 were included. Knowledge showed the understanding of diarrhea, ORT, and Zinc. Attitudes correspond to feelings regarding diarrhea, ORT, and Zinc. Practices refer to people's hygiene practices, their health-seeking behavior, feeding practices, use of ORT, and Zinc was analyzed.

**Inclusion criteria:** Mother of children between two months to five years of age with acute diarrhea (who could provide correct information about feeding, preparation/Use of ORS and drugs).

**Exclusion criteria:** Mothers who were not willing to participate in the study, Mother of children with acute diarrhea who were critically ill at presentation.

Understanding of diarrhea, causes, modes of spread of infection, predisposing factors, danger signs, and dehydration were assessed. A score of

one each was given for every correct response and zero for every incorrect response amounting to a total value of 6 with a mean value of 4. Mothers who were able to tell more than or equal to 4 correct responses had good knowledge on diarrhea. Mothers who were able to tell less than 3 correct responses had average knowledge of diarrhea. Knowledge score on ORT was given based on assessing the knowledge of correct usage of ORT, HAF, and continued feeds. A score of one each was given for every correct response and zero for every incorrect response amounting to a total value of 3. Mothers who had a knowledge score of more than or equal to 2 were said to have desirable knowledge on management. Mothers who had a knowledge score of less than 2 were said to have non-desirable knowledge of management. An attitude score on ORT was given based on assessing the attitude towards usage of ORT, HAF, and continued feeds. A score of one each was given for every positive attitude among mothers and zero for negative attitude towards usage of each of them amounting to a total value of 3. Practice score on ORT was given based on assessing the practices of mothers on the correct usage of ORT, HAF and continued feeds. A score of one each was given for every correct practice done and zero for every incorrect practice on the usage of each of them amounting to a total value of 3. Mothers who had practice score value of more than or equal to 2 were said to have desirable practices on the methods of management of diarrhea. Mothers who had practice scores value less than 2 were said to have non-desirable practices on the methods of management of diarrhea.

### Statistical analysis

Data was spread in an excel sheet and analysis was done using the SPSS package. The entered data was cleaned and validated for consistency. Prevalence was expressed in percentage. For comparison among categorical variables, the Chi-square test was used. A p-value of < 0.05 was considered to be significant.

## Results

In our study, a total of 211 mothers were selected as study participants. Of these potential respondents, 211 mothers were interviewed successfully representing a response rate of 100%. The present study estimated the knowledge of mothers of under-five children with acute diarrhea regarding diarrhea, ORT, and zinc and the correct practices of the same among these mothers and assessed the association between knowledge, attitude and practice and various demographic factors such as age, educational status, parity and a socioeconomic status, previous episode of diarrhea.

Among this study, there were 31.8% (67) children under 12 months of age and 39.3% (83) children were between 13-24 months. 20.4% (43) children were in the age group of 25-36 months; 7.1% (15) children were in the age group of 37-48 months; 1.4% (3) children belonged to the age group of 49-60 months. The mean age (SD) of the child was 20 months (11.26). The total number of children under-5 years of age in the study group was 211. Among them 59% (125) were male children and 41% (86) were female children (**Graph – 1**).

**Graph – 1:** Child age group distribution.

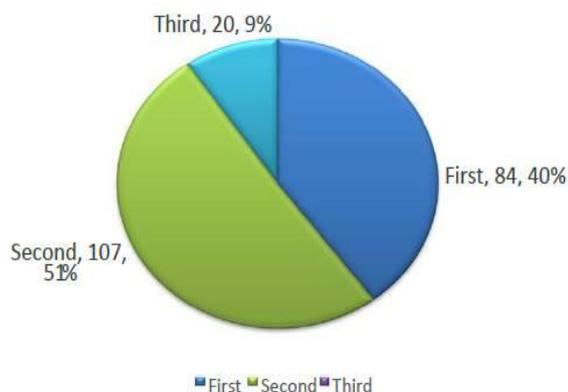


Among the study group, 40.3% (84) of the child belonged to 1<sup>st</sup> order of birth, 50.2% (107) belonged to 2<sup>nd</sup> order of birth and 9.5% (20) belonged to 3<sup>rd</sup> order of birth (**Graph – 2**).

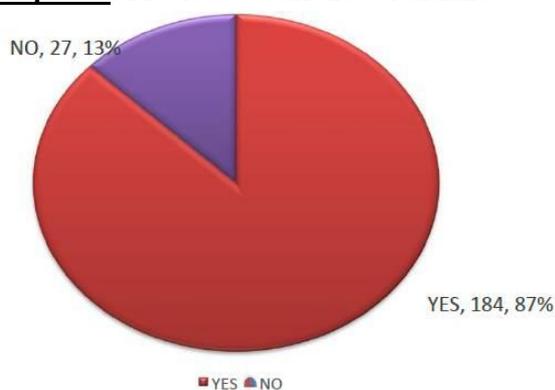
Among the study group 87% (184) of mothers said that any one of her children had a previous

episode of diarrhoea, 13% (27) had no previous occurrence of diarrhoea (**Graph – 3**).

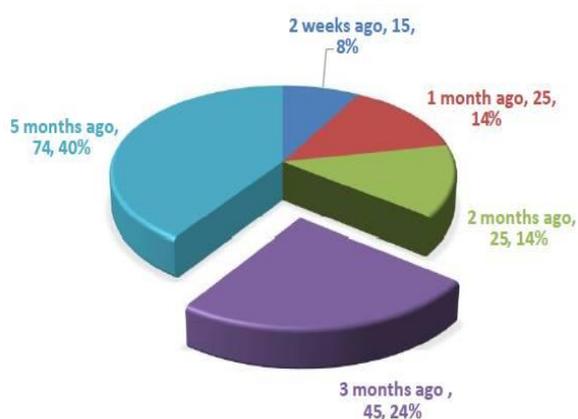
**Graph – 2:** Birth order of child for the mother.



**Graph – 3:** Previous occurrence of diarrhoea.



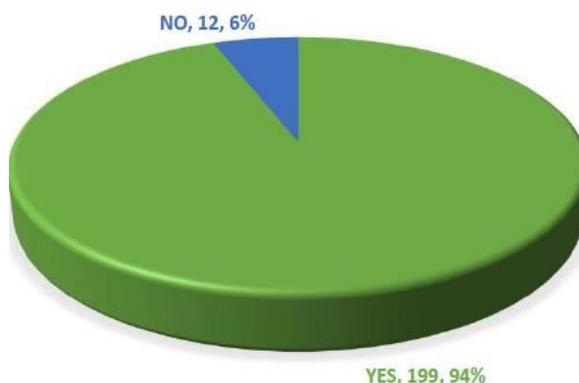
**Graph – 4:** Previous diarrhoeal episode.



Among the study group 40% (74) of mothers' child had diarrhoea 5 months ago, 24% (45) had diarrhoeal episode 3 months ago, 14% (25) had diarrhoea 2 months ago, 14% (25) had an episode of diarrhoea one-month ago and 8% (15) had 2 weeks ago (**Graph – 4**).

Among the study group 94% (199) of mothers got health education about diarrhoea 6% (12) of mothers did not get any health education (**Graph – 5**).

**Graph – 5:** Health education of diarrhoea for mothers.



**Table - 1** shows the mother's diarrhoeal knowledge (understanding of diarrhoea, causes, modes of spread of infection, predisposing factors, danger signs, and dehydration). Among the study group, 174 mothers were rightly identifying diarrhoea (that is, frequent passing of watery stool- three or more times in a day). 25 and 23 mothers were able to tell as mucus in stools and as greenish or greenish-yellow stools respectively. Concerning the cause of diarrhoea, Infection was top 89 among the attributable cause of diarrhoea by the mothers. Other reasons assigned by some of the mothers as the causes of diarrhoea were food poisoning (77), worm infestation (67), poor digestion and absorption of food (67), teething/crawling, evil eye/dosham, eating mud, drug effect and infant formula (78). Mode of the spread of infection was identified as unclean fingers and hands by 177 mothers, 166 mentioned as contaminated water, as contaminated food by 48 mothers, as flies by 42 mothers, and as bottle feeds by 18 mothers. Among the study group, 153 mothers were not aware of the predisposing factors of diarrhoea. 43 mothers mentioned vitamin deficiency and 28 mentioned undernourishment /malnutrition as the predisposing factors. Among the study group, 155 mothers mentioned fever, 128 mentioned repeated vomiting, 126 mentioned worsening of watery stools and 22 mentioned blood in the

stool as the danger signs associated with diarrhoea. Among the study group 35 mothers mentioned eating or drinking poorly, 97 mentioned sunken eyes, 54 mentioned dry lips and tongue, 37 mentioned lethargy, 102 mentioned marked thirst of water and 37 mentioned reduced urine output and irritability as signs of dehydration. Knowledge of diarrhoea

among mothers has been assessed based on their ability to tell about the understanding of diarrhoea, causes, modes of spread of infection, predisposing factors, danger signs, and dehydration. Among the total population, 69% (146) had good knowledge of diarrhoea whereas, 31% (65) had only average knowledge of diarrhoea.

**Table – 1:** Knowledge regarding diarrhoea.

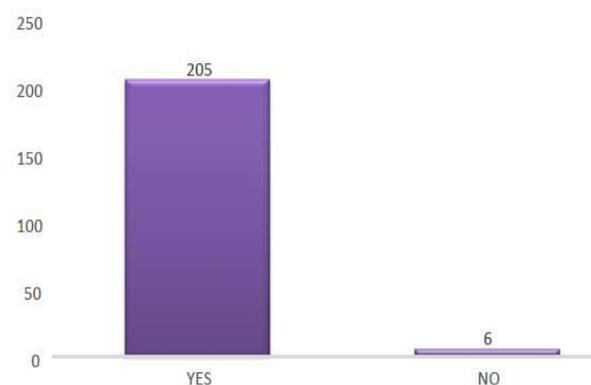
Knowledge regarding diarrhoea	Frequency	Percentages
<b>a) Understanding of diarrhoea</b>		
Frequent passing of watery stool (more than 3 episodes)	174	82.5%
Frequent passing of non-watery stool	5	2.3%
Blood in stools	19	9%
Mucous in stools	25	11%
Greenish stools or greenish-yellow	23	10%
<b>b) Causes of Diarrhoea</b>		
Infection	89	42.18%
Food Poisoning	77	36.49%
Eating Mud	7	3.31%
Teething / Crawling	38	18%
Worm Infestation	67	31.8%
Evil Eye / dosham	29	13.7%
Poor digestion & absorption of food	67	31.8%
Others; drug effects	4	1.8%
<b>c) Modes of the spread of infection</b>		
Contaminated water	166	78.2%
Spoiled or contaminated food	48	22.5%
Flies	42	19.9%
Bottle feeds	19	9.3%
Unclean fingers and hand	171	80.9%

Knowledge regarding diarrhoea	Frequency	Percentages
<b>d) Predisposing Factors</b>		
Undernourished/underweight	29	13.3%
Measles infection	5	2.4%
Vitamin deficiency	43	20.3%
Unimmunisation	1	0.5%
Don't know	153	72.5%
<b>e) Dangerous signs Associated with Diarrhoea</b>		
Repeated vomiting	128	60.8%
Starts to pass many watery stools	126	59.8%
Develops a fever	155	73.6%

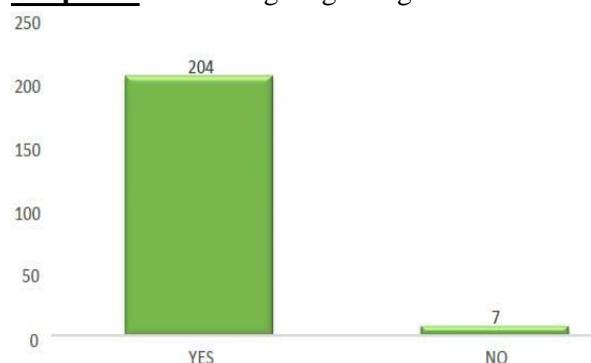
Blood in stool	22	10%
<b>f) Signs of Dehydration</b>		
Marked thirst for water	102	48.4%
Is eating or drinking poorly	35	16.58%
Sunken eye	97	45.97%
Dry Lips and tongue	54	25.59%
Reduced urine output	18	8.5%
Irritability	19	9%
Lethargic	37	17.53%
Don't know	6	2.8%

Among the study group 97.2% (205) of mothers perceived that dehydration due to diarrhea will lead to the serious illness of their child's health, 2.8% (6) of mothers still think it is harmless (**Graph – 6**).

**Graph – 6:** Knowledge regarding serious illness of diarrhea.



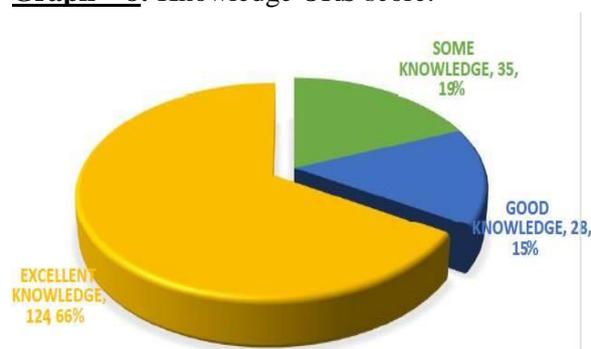
**Graph – 7:** Knowledge regarding ORS.



Among the study group 96.7% (204) mothers had heard about Oral rehydration ORS and 3.3% (7) of mothers had not heard about ORS. Among the 187 mothers, 75.9% (142) knew the correct

duration of storage of mixed ORS which is 67.3% for the total study population, 24.1% (45) mothers had incorrect knowledge of storage of mixed ORS. Among these 187 mothers who knew ORS preparation, 19% (35) some knowledge (knew any one of the above mentioned), 15% (28) had good knowledge (knew any 2 of this above), and (66%) 124 had excellent knowledge (knew all the 3 or above) which was 59% for the total population (**Graph – 7**).

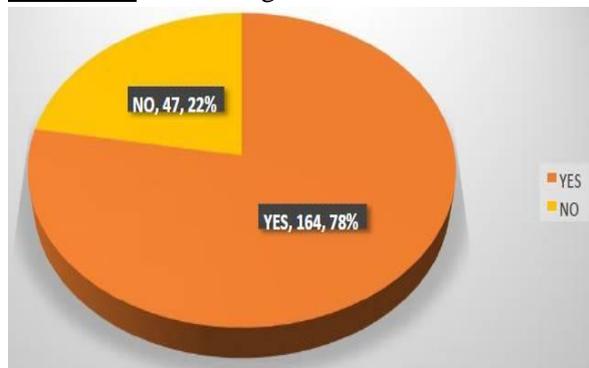
**Graph – 8:** Knowledge ORS score.



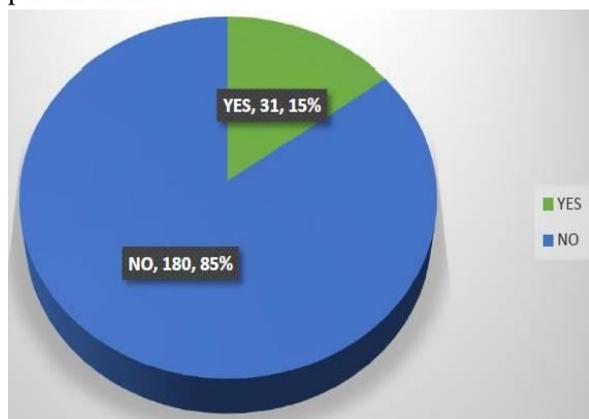
Among the total study population, 84.4% of mothers knew the use of ORS in correcting the fluid loss in diarrhea and 28% (61) of mothers knew the role of ORS to prevent dehydration, 5.7% (12) said it helps to decrease diarrhea, 8% (17) did not know the role of ORS and 4.3% thought as it has not many uses, not reduce diarrhea and could treat diarrhea with the help of antibiotics only. Out of the total population, 3% were not aware of ORS (mother gave more than one answer) as per **Graph - 8**.

Among the study group 77.7% of mothers (164) were aware of recommended home available fluids, and 22.3% of mothers (47) were not aware of recommended HAF (**Graph – 9**).

**Graph – 9:** Knowledge of recommended HAF.



**Graph – 10:** Knowledge regarding zinc and its part in diarrhea.



Among the 211 mothers 14.7% (31) only had heard about zinc and its availability in the government hospitals, 85.3% (180) were not aware of zinc and its availability. Among those aware (31 mothers), 29 mothers came to know about it through the doctor, another 2 mothers came to know about it through the health worker. Among 31 mothers, 27 of them were aware of the dosage and duration of administration of zinc during diarrhea. And 4 mothers were not aware of the dose and duration of zinc supplementation for children during diarrhea despite being aware of zinc. Among the 27 mothers, 17 understood the correct dosage (10mg <6months of age, 20mg for more than 6 months of age), and out of them, only 7 mothers were aware of the correct duration (14 days), of zinc administration for

diarrhea. Only 3.3% of the study group knew the correct knowledge of zinc. Among the mothers 27 who knew the role of zinc 21 mothers were told to reduce the severity of diarrhea, 6 mothers were told to reduce the duration of diarrhea and keep children strong. Knowledge of the role of zinc among the study population was 12.7%. Among the study group, 23% (48) of mothers started medicines at home before going to the hospital and stayed at home for < 24 hours after diarrhea started. They visited the doctor only when the child did not improve with this. 77% (163) of mothers brought the child to the hospital without giving any medicines at home (**Graph – 10**).

## Discussion

The revised guidelines for the management of diarrhea by the Government of India and Indian Academy of Pediatrics recommend low osmolar ORS, Zinc, and continued feeding of energy-dense feeds in addition to breastfeeding [5]. The guidelines also emphasize the importance of home available fluids, hand washing, and hygienic practices. The real challenge in the diarrhea treatment program is a universal and optimal application of diarrhea management guidelines. India has attained impressive achievements in the fields of child survival [6]. Although the Government of India has initiated the provision of zinc in addition to low osmolar ORS in the public health system persons who received ORS and zinc are very less [7]. Tamil Nadu data from NFHS-3 (32.2%) and NFHS-4 (61.8%) showed that the ORS usage rate has improved relatively but still it is low to achieve the MDG-4. One of the main reasons for this is the lack of knowledge amongst mothers of under 5 children and health care providers on how to implement existing cost-effective interventions [8]. Antimicrobials are recommended only for gross blood in the stool, Shigella positive culture, cholera, associated systemic infections, and severe malnutrition [9]. Oral zinc supplementation is a simple and effective therapeutic intervention in the management of acute diarrhea. In a study conducted by Hackett

KM, et al. in Bangladesh, children showed that zinc therapy for diarrhoea increases the use of ORS and reduces the use of antimicrobials and other drugs. The present study arrived to understand the Knowledge, Attitude, and Practices of mothers during acute diarrhoea to identify the lacunae in their Knowledge, Attitude, and Practices and to modify their practices. In our study, a total of 211 mothers were selected for the study. Of these potential respondents, all mothers were interviewed successfully representing a response rate of 100%. In our study, the mean age (standard deviation) of the mothers was 25.72 (4.54) years [10]. The majority of the study group i.e., 83.4% (176) belongs to the age group of 20-29 years. There is a significant association between increasing age of the mother and knowledge and practices on diarrhoea and ORT [11]. The results were consistent with Keusch GT, et al. studies who also showed that mothers who were literates had more knowledge on ORT and zinc. Most of the mothers of my study population (89.6%) were housewives. The major socioeconomic status of my study group was Upper lower class and only 1.9% was lower class since it is an urban study. Knowledge of diarrhoea and ORT is more in upper socioeconomic classes than the lower class. My study population mostly (43.6%) lives in a Pucca house. The majority of my study population depends on cane water (35.5%) and common tap/tank water (34%). Even though my study has been conducted in a metropolitan city only 49% of my study group used separate latrines for defecation and still, 22% keep doing open defecation which is significant because this will increase the rate of contamination [12]. 71% of the mother's children who participated in my study were less than 2 years of age. In a similar hospital-based study about diarrhoea conducted at Lahore by King CK, et al. also 71% of them were below 2 years of the age group which supports that the predominant age group of occurrence of diarrhoea in children is less than 2 years. Among this study group, 87% had a previous episode of diarrhoea. Mothers with experience on a previous diarrhoeal episode in their children had better knowledge of diarrhoea

and practiced desirable ORT. In my study, 94% received health education about diarrhoea since this is a hospital-based study [13]. Out of my study group, 82.5% told the correct definition of diarrhoea; Infection has been the top among causes of diarrhoea being said by most (58.3%) mothers; Most of the mothers think that diarrhoea spreads through contaminated water (78.2%); 72.5% of the mothers still don't know the significant predisposing factors; Fever (70%) has been considered as a danger sign by most mothers followed by repeated vomiting (60%); Most mothers think marked thirst (48.4%) and sunken eyes (41.6%) as signs of dehydration; Dehydration due to diarrhoea is still considered harmless by 2.8% which can lead to significant morbidity and mortality [14]. The results are consistent with a hospital-based study conducted in Karachi in 2011 by Kunwar N, et al. which also assessed the knowledge on diarrhoea. Among them 72% defined diarrhoea correctly, But in contrast to our study 47% of the study group did not know about the causes of diarrhoea; Similar to our study most of the mothers think contaminated water as the mode of spread of diarrhoea; Most of the study group told signs of dehydration as nonspecific answers (40%) followed by sunken eyes (26%). Our study showed that 98.1% of the participants think diarrhoea is preventable and still 1.9% think that diarrhoea cannot be prevented [15]. Awareness of ORS among their study group was 74.5% out of which 79.9% mothers came to know about ORS through health care providers similar to our study; The method of preparation of ORS was known among 91.3% out of which 72.8% knew the correct method of ORS; Majority of them told that the role of ORS is to correct fluid loss and 59.4% did not know the role of ORS which is more than in our study population [16]. Among the study population, 65.4% had a positive attitude towards giving ORS, 87.2% believed ORS has no side effects and 55.4% had a positive attitude towards repeating ORS if the child vomits. ORS usage rate in my study was 46.91% and the correct usage rate was 33.17% [17]. The major reason for discontinuing or not giving ORS in our study was that child did not

want to drink and persistent vomiting whereas in a community-based study conducted by Motarjemi Y, et al. in 2012, 45.5% of the study group gave ORS. About one-third (31%) of mothers did not give ORS given to them because the majority (62%) had no faith in ORS. In the present study, 77% were aware of recommended home available fluids such as tender coconut, sugar and salt solution, rice water with salt, buttermilk/yogurt, and vegetable soup. Out of the total population, 5.6% were exclusively breastfeeding their child, 88.6% had a positive attitude, and only those administered HAF. The remaining 5.6% had a negative attitude and restricted the fluids. 71% of my study gave less than the usual fluids. Increased fluids were practiced only by 3% which is very important during diarrhea management to prevent ongoing fluid loss and dehydration [18]. Among 211 mothers' majority (90%) of them had a positive attitude towards continuing feeds and gave them during the diarrheal episode. 68.2% of mothers gave less than the usual feeds. This kind of attitude and practice is much significant because this can lead to malnutrition which in turn forms a vicious cycle and leads to worsening of infections and diarrhea [19]. The prevalence of knowledge on zinc among my study group is 14.6%. Only 12.8% of my study knew the role of zinc in diarrhea. In our study group, 85.8% of children were fully immunized and 14.2% were partially immunized. Among the study group, 2.4% of mothers knew that the Rota-viral vaccine prevents diarrhea of which only 1.4% received Rota viral vaccination [20].

## Conclusion

In our study, Three-fourth seeks care during diarrhea and mothers with higher educational qualification, socioeconomic and previous exposure have associated with good knowledge, attitude, and practice during diarrhea. Although knowledge on ORT among the mothers of under-five children is desirable, there is a big gap between the knowledge and practice as reflected by inadequate ORS usage rates, fluid intake, and

continued feeding practices. Knowledge and use of zinc and Rotavirus vaccination to prevent rotavirus specific diarrhea are very low compared to national data. ORT and Zinc therapy during diarrhea and diarrheal disease preventive strategies can be up scaled through existing infrastructure by information, education and communication activities and introduction of its training component.

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