




Prevalence of Oral Rehydration Therapy Use During the Diarrheal Episode and Associated Factors Among Mothers of Under-Five Children Visiting Public Health Facilities in North Showa Zone, Oromia Region, Ethiopia

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Background: Oral rehydration therapy reduces mortality and morbidity due to diarrheal diseases. However, Oral rehydration therapy remains to be underused worldwide and particularly in low-income countries. This study aims to assess the prevalence of oral rehydration therapy use during diarrheal episode and associated factors among mothers of under-five children visiting public health facilities in North Showa zone, Oromia region, Ethiopia.

Methodology: Institutional based cross-sectional study design was employed for one month in June 2020. A structured interview administered questionnaire was used to collect data. Data were entered into EPI-info 3.5.2 then transported to SPSS 21 version. Descriptive statistical analysis was done, and an association between dependent variables and independent variables were examined in logistic regression models.

Results: The overall prevalence of oral rehydration therapy use during diarrheal episode was 51.5%. Maternal literacy [AOR= 2.175, 95% CI: (1.178, 4.015)], mothers occupation being farmer [AOR= 0.394, 95% CI: (0.203, 0.762)], post natal care visit [AOR= 2.565, 95% CI: (1.468, 4.480)] and good knowledge of oral rehydration therapy [AOR= 1.919, 95% CI: (1.132, 3.253)] were significantly associated with oral rehydration therapy use.

Conclusion: In this study oral rehydration therapy use was moderate. Maternal literacy, good knowledge of oral rehydration therapy, maternal occupation being a farmer, and postnatal care visit were the independent predictors of oral rehydration therapy use. Therefore, programmers and stakeholders who are working on child health programs should design interventions that focus on factors deterring child oral rehydration therapy use during diarrheal episode morbidity and mortality.

Keywords: diarrhea, oral, practice, rehydration solution, under-five children

Introduction

Worldwide, annually, diarrhea kills more than 5.2 million under-five children.¹ Every under-five children experience five episodes of diarrhea per year, and around 800,000 children die of diarrhea and dehydration each year in Africa.² Sub-Saharan African countries share a significant proportion (42%) of these deaths.³ Ethiopia ranks fifth globally as diarrhea caused about one fourth (20–27%) of child deaths.⁴

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Diarrhea causes death by removing essential body fluids and nutrients with subsequent dehydration and malnutrition.⁵ To decrease mortality and morbidity due to diarrheal diseases World Health Organizations (WHO) and United Nations Children's Fund (UNICEF) had laid out Oral Rehydration Therapy (ORT) as one of the interventions for the management of diarrhea.^{6,7} In addition to reducing mortality by avoiding dehydration, ORT is also important for faster growth and development, particularly when glucose-based ORT is utilized.^{8,9} ORT can easily be administered at home by mothers/caregivers as soon as diarrhea episode begins. It is a simple, inexpensive, and most effective way to treat dehydration and reduce mortality. ORT has been promoted primarily by WHO.⁷

Despite extensive efforts made by made to advocate ORT for several decades by international and national agents, its utilization by mothers remained insufficient.⁷ Analysis of two Demographic and Health Surveys (DHS) done in 34 countries revealed that 68% of them declined in ORT use for children under-five years of age.¹⁰ According to Ethiopian Demographic Health Survey (EDHS) 2016, only 46% of children under age 5 with diarrhea received ORT and it is far below the recommended. The prevalence of ORT use among caregivers in the Oromia region of Ethiopia is even less than (41%) at the national level.¹¹

In addition to the insufficiency of practice, there is also some indication that shows hazardous practices like fluid restriction and breastfeeding reduction, in managing diarrhea at home by caregivers.¹² Since mothers are the chief caregivers of children, mothers' management skill is important to minimize the effects of morbidity and mortality associated with diarrheal diseases. Their socioeconomic condition significantly influences the health status of their children and the outcome of diarrhea episodes.¹³

The majority of previous studies considered both feeding and fluid replacement simultaneously and most of them focused only on Oral Rehydration Salt (ORS), overlooking Recommended Home Fluids (RHF). Hence, there is the scarcity of research finding which studies ORT use, the most important aspect in treatment package, among mothers separately. Only little is known on child fluid replacement practice during the diarrheal episode and no determinative studies have been formerly conducted that address ORT use during diarrheal episodes among mothers with under-five children in Ethiopia. Therefore, this study aimed to assess prevalence of oral rehydration therapy use during diarrheal episode and associated factors among mothers of under-five children visiting public health

facilities in North Showa Zone, Oromia region, Ethiopia, to generate pragmatic evidence that could direct and impact public health strategies.

Methods

Study Design and Study Area

The institutional-based cross-sectional study design was employed for one month in June 2020. The study was conducted in the North Showa Zone of the Oromia Regional State of Ethiopia. The zone's capital city is Fiche which is located at a distance of 112 km from Addis Ababa in the north direction. North Showa is surrounded by Amara regional state in North and East, Addis Ababa especial zone in South and West Showa zone in the West. The zone has fourteen districts with a total population of 1,639,587 where 820,595 are male and 818,992 are female. Eighty-eight percent (1,447,330) North Showa population lives in rural and 12% (192,105) is living in urban. The North Showa Zone has 2 general hospitals and 2 district hospitals, 63 health centers, and 268 health posts. It has 7 medium clinics, 54 lower clinics, 1 drug store, 25 drug vendors, and 3 rural drug vendors.

Study Population

The study population was all mothers of children age less than five years visiting health institutions during the data collection period, whose child has a diarrheal episode in the past three months before the time of data collection. Mothers who were not able to respond to the interview during data collection due to illness were excluded from the study. Mothers who do not volunteer to participate in the study were also excluded.

Sample Size Calculation

The sample size for this study was calculated using the formula for a single population proportion considering the following assumptions.

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

Where:

n= minimum sample size required for study,

p= prevalence population proportion 46% (0.46),¹¹

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

d= margin of error 5% (0.05).

Thus, n is calculated as:

$$n = \frac{(1.96)^2(0.46)(0.54)}{(0.05)^2} = 381$$

Thus, the final sample size was 401 after adding 5% of the non-response rate.

Sampling Technique and Procedure

Five Public Health Facilities

Three health centers and two hospitals were included in the study. All patient flow less than five years of age children in the last two consecutive years of the same period of data collection was taken from the monthly registration book of each health institution and these two years patient flow data average was used as a baseline to proportionally allocate the study participants. Then, the number of actual study participants for each health institution was calculated and taken proportionally. Then participants were selected by using a systematic random sampling technique to ensure representativeness.

Instrument

The tool was adapted from similar studies conducted elsewhere and WHO standard guidelines. The tool included: socio-demographic characteristics of study participants and index child; health Care Service and utilization characteristics; knowledge of mothers on ORT and ORT use during the diarrheal episode. It was pre-tested on 5% of the study population before actual data collection and necessary adjustments were made. Five diploma nurses for data collection and two BSc nurses for supervision were recruited. The training was given to the data collectors and supervisors on the study's objective and data collection methods. Data were collected by face-to-face interviews. During data collection, the completeness and consistency of the responses in the study questionnaire were checked daily by the principal investigator before submission.

Operational Definition

Oral rehydration therapy: Provision of ORS, recommended home fluids, or increase fluids.

Recommended home fluids: Food-based fluids (such as soup, gruel (atmit), rice water, and yogurt drinks), or clean water.

Oral rehydration therapy use: A child less than two years of age who receive half a cup (50–100mL) of ORT or two years of age and above who receive a cup (100–200mL) of ORT after each loose stool will be considered as ORT user. Mothers were asked the amount of ORT used in the cup, as the metric measurement system might be ambiguous to them.^{14,15}

Diarrheal episode: is defined as three or more loose or watery stools per day, and/or blood in the stool on any day, or as defined by the mother.¹⁶

Knowledge: Mothers who respond above the mean of the questions correctly were assigned as having “good knowledge” while mothers who answered below the mean were regarded as having “poor knowledge.”

Data Processing and Analysis

Consistency and completeness of responses filled in questionnaires were first checked. Data were pre-coded manually, and it was entered into EPI-info 3.5.2 then transported to SPSS 21 version for analysis. Data editing was done after data entry by running frequencies then checking for missing values and outliers. Descriptive statistical analysis was done and presented in percentage, mean, standard deviation (SD), table, and graphs. Bivariate analysis between dependent and independent variables was done using binary logistic regression. Multicollinearity of independent variables was checked by Variance Inflation Factor (VIF), and all values were below the recommended maximum VIF values of four. All covariates that are significant at p-value < 0.25 in bivariate analysis were considered for multivariate analysis to control all possible confounders. Association was expressed as crude odds ratios (COR) and adjusted odds ratio (AOR), and their corresponding 95% confidence intervals (CIs) were obtained from logistic regression models. Odds ratios (OR) were reported together with their 95% CI, and statistical significance was declared at P-value < 0.05.

Ethical Considerations

Ethical clearance was obtained from the Salale University Ethical Review Committee and it was given to selected institutions. Then permission was granted from each institution. All eligible study participants were informed about the purpose of the study, and interviews were held only with those who agreed to give written/fingerprint consent to participate. The consent process was approved by Salale University Ethical Review Committee. All responses were kept confidential. The study was conducted according to the Declaration of Helsinki.

Result

Sociodemographic Characteristics

A total of 398 mothers with children age less than five years participated in the study with a response rate of 99%. The mean age of mothers was 27.83 (±5.66SD) years. And mean

age of studied children was 17.92 months (15.747SD). The majority 339 (89.2%) of the respondent were Orthodox 329 (82.7%) and 51 (12.8%) were Protestant. About one-fourth of 94 (23.6%) of the respondents were illiterate. The mean number of the people in the family was 4.42 (± 1.4 SD). Out of 398 children who participated in the study about half 196 (49.2%) of them were male (Table 1).

Health Care Service and Utilization Characteristics

A significant number of study participants 352 (88.4%) delivered their child under study at health institutions. On the other hand, 50 (12.6%) and 284 (71.4%) of mothers did not attend health institutions for ANC and PNC follow-up respectively. More than three fourth 310 (77.9%) of study participants reported that the child under study was up-to-date to the current immunization schedule (Table 2).

ORT Use During Diarrheal Episode and Maternal Knowledge

The overall prevalence of ORT use among study participants 51.5% and two-thirds (67.1%) of study participants have good knowledge on the use of ORT during the diarrheal episode. About one-third (23.6%) of study participants reported the availability of ORS at their home (Table 3).

Factors Associated with ORT Use During a Diarrheal Episode

In binary logistic regression analyses, the factors associated with feeding practices were: age of mother, educational status of the mother, occupation of mother, ANC follow-up, PNC, place of delivery, immunization status, knowledge on ORT, and ORS availability at home.

In multivariate logistic regression, literate mothers were two times more likely to use ORT during diarrheal episodes than odds of illiterate mothers [AOR= 2.175, 95% CI: (1.178, 4.015)]. Mothers whose occupation was farmer were less likely to use ORT as compared to mothers whose occupation was housewife [AOR= 0.394, 95% CI: (0.203, 0.762)]. Mothers who made PNC follow after delivery were more than two times more likely to use ORT [AOR= 2.565, 95% CI: (1.468, 4.480)]. Mothers who had good knowledge of ORT were more likely to use ORT during diarrheal episodes [AOR= 1.919, 95% CI: (1.132, 3.253)] (Table 4).

Table 1 Socio-Demographic Characteristics of the Study Participants and Index Child, Health Institutions in North Showa Zone, Oromia Region, Ethiopia, July 2020 (n= 398)

Variables	Category	Frequency	Percent
Age of mother in years	<20	42	10.6
	20–29	208	52.3
	≥ 30	148	37.2
Residence	Urban	191	48.0
	Rural	207	52.0
Religion	Orthodox	329	82.7
	Protestant	51	12.8
	Muslim	18	4.5
Ethnicity	Oromo	301	75.6
	Amhara	83	20.9
	Other ^a	14	3.5
Mother's educational status	Illiterate	94	23.6
	Literate	304	76.4
Mother's occupation	Housewife	176	44.2
	Merchant	69	17.3
	Government employee	81	20.4
	Farmer	72	18.1
Family income in ETB	≤ 1000	30	7.5
	1001–3000	37	9.3
	≥ 3001	143	35.9
	Do not know	188	47.2
Family size	≤ 4	233	58.5
	≥ 5	165	41.5
Number of U-5 children	1	266	66.8
	>1	130	32.7
Age of index child in months	<20	42	10.6
	20–29	208	52.3
	≥ 30	148	37.2
Sex of index child	Male	196	49.2
	Female	202	50.8

Note: ^aGurage or Tigre.

Abbreviations: U-5, under five; ETB, Ethiopian birr.

Table 2 Health Care Service and Utilization Characteristics of the Study Participants and Index Child, Health Institutions in North Showa Zone, Oromia Region, Ethiopia, July 2020 (n= 398)

Variables	Category	Frequency	Percent
ANC follow-up status	No visit	50	12.6
	1–3 visits	165	41.5
	≥4 visits	183	46.0
Place of delivery	Home	46	11.6
	Health institution	352	88.4
PNC follow-up	No	284	71.4
	Yes	114	28.6
Immunization status	Up-to-date	310	77.9
	Not up-to-date	88	22.1

Abbreviations: ANC, antenatal care; PNC, postnatal care.

Table 3 Maternal Knowledge and ORT Use During Diarrheal Episode Among the Study Participants and Index Child, Health Institutions in North Showa Zone, Oromia Region, Ethiopia, July 2020 (n= 398)

Variables	Category	Frequency	Percent
Previous ORT use	No	193	48.5
	Yes	205	51.5
Knowledge on ORT	Poor	131	32.9
	Good	267	67.1
ORS available at home	No	304	76.4
	Yes	94	23.6

Abbreviations: ORS, oral rehydration salt; ORT, oral rehydration therapy.

Discussion

In this study, we assessed ORT use and factors associated with ORT utilization for the management of diarrhea in under-five children. The study revealed that the magnitude of ORT use during the diarrheal episode was 51.5%. The study is relatively higher as compared to the national level (46%) and the Oromia region (41%) as per EDHS, 2016.¹¹ This could be due to increasing awareness creation on ORT use. This result is in agreement with the study conducted in Dangure, Benishangul Gumuz of Ethiopia¹⁷ and it is lower than the previous study conducted in which 61.8% in Nigeria,¹⁸ 61% in Kenya,¹⁹ and 58.2% in Assela Town of Ethiopia.²⁰ This could be due to socio-demographic differences among study participants, and

other health care service-related issues. However, the finding was higher as compared with a study done in Nigeria, Kano State, which is 37.6%²¹ and 34.6% in Western China.⁸ This inconsistency might be due to a long-standing source of speculation in which mothers need a parental preference for treatment.

In this study, literate mothers were more likely to use ORT than their counterparts during the diarrheal episode. This is consistent with the studies conducted in, West Gojjam,²² Iran,²³ and Nigeria.²⁴ This might be due to educated mothers might have awareness regarding their child's health and they might be active to take their sick child to the nearby health facility. This, in turn, might create an opportunity for mothers to get advice from health professionals and give the recommended or the ORT for their sick child. Literate mothers can use also use available information, communication, and education materials on diarrhea disease home management.

In this study, mothers who were with good knowledge on ORT were more likely to use ORT than their counterparts. This finding is supported by a study conducted in Finote Selam,²² Kerisa district,²⁵ and Iran.²⁶ This might be because having information and awareness was an entry point to the development of knowledge, this suggests that having good knowledge contributes to better practices of feeding during the diarrheal episode.

Consistent with studies done Western Kenya,¹⁰ Kerisa district of Western Ethiopia,²⁵ and Assosa,²⁷ in this study the likelihood of using ORT for the management of diarrhea in under-five children was higher among mothers who made PNC follow-up after delivery. This similarity might be due to the awareness of diarrhea management among participants and health care service-related situations.

Moreover, the odds of ORT utilization among mothers from whose occupation was a farmer was decreased by 61% [AOR=0.39, 95% CI: (0.203, 0.762)] as compared to mothers whose occupation was a housewife. This finding is in agreement with the study conducted in Fagita Lekoma District, Northwest Ethiopia.²⁸ This could be due to the fact that mothers whose occupation farmer usually stays away from their home and they are available to provide ORT to their children as soon as diarrhea begins.

The clinical and public health implication of this study is to enhance ORT use for the management of diarrhea in under-five children by identifying the factors attributed to ORT utilization. Therefore, considering and taking special attention to factors that favor the utilization of ORT for the management of diarrhea among under-five children such

Table 4 Binary and Multivariate Regression Analysis of Factors Associated with ORT Use Among Mothers with Children Age Less Than Five Years, Health Institutions in North Showa Zone, Oromia Region, Ethiopia, July 2020 (n= 398)

Variables	ORT Use		COR (95% CI)	AOR (95% CI)	P-value
	No	Yes			
Age of mother in years					
<20	24	18	1	1	
20–29	113	95	1.12(0.57, 2.19)	0.651(0.304, 1.396)	0.270
≥30	56	92	2.19(1.09, 4.39)	2.141(0.951, 4.818)	0.066
Mother's education					
Illiterate	64	30	1		
Literate	129	175	2.894(1.774, 4.723)	2.175(1.178, 4.015)	0.013**
Mother's occupation					
House wife	94	82	1	1	
Merchant	29	40	1.581(0.901, 2.775)	1.228(0.657, 2.295)	0.520
Government employee	20	61	3.496(1.947, 6.279)	1.933(0.966, 3.868)	0.063
Farmer	50	22	0.504(0.282,0.903)	0.394(0.203,0.762)	0.006**
ANC follow-up in number					
No visit	36	14	1	1	
1–3 visits	77	88	2.939(1.476,5.853)	1.400(0.625, 3.136)	0.414
≥4 visits	80	103	3.311(1.672, 6.554)	1.610(0.714, 3.630)	0.251
Place of delivery					
Home	30	16	1		
Health institution	163	189	2.174 (1.144, 4.131)	0.908(0.436, 1.890)	1.890
PNC follow-up					
No	159	125	1		
Yes	34	80	2.993(1.881, 4.763)	2.565(1.468,4.480)	0.001**
Immunization status					
Up-to-date	52	36	1	1	
Not up-to-date	141	169	3.003(1.939, 4.652)	0.821(0.461, 1.464)	0.505
Knowledge on ORT					
Poor	87	44	1		
Good	106	161	2.985(1.809,4.924)	1.919(1.132,3.253)	0.016**

Note: **Significant at P value < 0.05.

Abbreviations: ORT, oral rehydration therapy; ANC, antenatal care; PNC, postnatal care; COR, crude odds ratio; AOR, adjusted odds ratios; CI, confidence intervals.

as maternal literacy, a good level of knowledge, PNC follow-up, and maternal occupation being housewife could contribute to ORT use.

As usual, this study is not without limitations. First recall bias and social desirability bias might have occurred. Secondly, it was a cross-sectional study and it

is difficult to know the cause and effect relationship. Lastly, since the study is institutional-based, the results might lack generalizability to the entire population.

Conclusion

In this study oral rehydration therapy use among mothers having under-five years with diarrhea was moderate. The study identified that Literacy, knowledge about ORT, being a farmer, and PNC visits were the independent predictors of ORT use. It could be very important to reinforce the strategies and the approaches to reach caregivers to increase the coverage of the ORT use. Therefore, programmers and stakeholders who are working on child health programs should design health intervention that aims at factors influencing child feeding practices is indispensable to further improve ORT use during a diarrheal episode.

Abbreviations

CSA, Central Statistical Agency; DHS, Demographic Health Survey; PNC, Postnatal care; SPSS, Statistical Package for Social Sciences; UNICEF, United Nations Children's Fund; WHO, World Health Organization; SD, Standard Deviation; AOR-Adjusted Odds Ratios; ANC, Antenatal Care; COR, Crude Odds Ratio; CI, Confidence Interval; ORT, Oral Rehydration Therapy; RHF, Recommended homemade Fluids, ORS, Oral Rehydration Salt; VIF, Variance Inflation Factor.

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Author Contributions

All authors made substantial contributions to the conception and design of the work, the acquisition, analysis, and interpretation of data; drafting the manuscript and revising critically for important intellectual content; agreed to submit to the current journal; gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

Disclosure

The authors declare that there was no competing interest.

References

1. United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). *Levels & Trends in Child Mortality: Report 2020, Estimates Developed by the United Nations Inter-Agency Group for Child Mortality Estimation*. New York: United Nations Children's Fund; 2020.
2. World Health Organization. *Diarrhea: Why Children are Still Dying and What Can Be Done*. Geneva: World Health Organization; 2009.
3. Mohammed S, Tamiru D. The burden of diarrheal diseases among children under five years of age in Arba Minch District, Southern Ethiopia, and associated risk factors: a cross-sectional study. *Int Sch Res Not*. 2014;2014:654901. doi:10.1155/2014/654901
4. Black RE, Cousens S, Johnson HL, et al. Global, regional, and national causes of child mortality in 2008. A systematic analysis. *Lancet*. 2010;375(9730):1969–1987. doi:10.1016/S0140-6736(10)60549-1
5. Muhammad HK, Syed HS, Ghulam S, et al. Factors affecting the frequency of infantile diarrhea. 2004.
6. UNICEF. *Pneumonia and Diarrhea Tackling the Deadliest Diseases for the World's Poorest Children*. United Nations Children's Fund; 2012.
7. World Health Organization/United Nations. *Children' Fund: Clinical Management of Acute Diarrhea*. New York: WHO/UNICEF; 2004.
8. Gao W, Yan H, Wang D, et al. Oral rehydration salt use and its correlates in low-level care of diarrhea among children under 36 months old in rural Western China. *BMC Public Health*. 2013;13(1):238. doi:10.1186/1471-2458-13-238
9. Ema S. Utilization of oral rehydration therapy in the management of diarrhoea in children among nursing mothers in Odukpani local government area of Cross River State, Nigeria. *Am J Public Health Res*. 2016;4(1):28–37.
10. Bartlett AV, Breiman RF, Feikin DR, et al. Community case management of childhood diarrhea in a setting with declining use of oral rehydration therapy: findings from cross-sectional studies among primary household caregivers, Kenya, 2007. *Am J Trop Med Hyg*. 2011;85(6):1134–1140. doi:10.4269/ajtmh.2011.11-0178
11. CSA. *Ethiopia Demographic and Health Survey. Central Statistical Agency Addis Ababa*. Maryland, USA: Ethiopia ICF International Calverton; 2016.
12. Masiha SA, Khalid A, Malik B, Shah SMA. Oral rehydration therapy-knowledge, attitude and practice (KAP) survey of Pakistani mothers. *J Rawal Med Coll Stud Suppl*. 2015;19(1):51–54.
13. Mutalik AV, Raje VV. Relationship between maternal education and socioeconomic status on knowledge, attitude, and practice of mother and her child regarding acute diarrhoeal diseases. *Int J Community Med Public Health*. 2017;4:4472–4476. doi:10.18203/2394-6040.ijcmph20175155
14. Ministry of Health. *Integrated Management of Newborn and Childhood Illness*. Addis Ababa: FMOH; 2018.
15. WHO/UNICEF. *Treatment Guideline Including the New Recommendation for Use of ORS and Zinc Supplementation for Clinical-Based Health Workers*. Geneva: WHO/UNICEF; 2005.
16. Lung'aho MS. Infant and child feeding indicators measurement guide. Published for the United States Agency for International Development by the FANTA Project, Academy for Educational Development Washington, DC. 1999.
17. Misgna HG, Ebessa B, Kassa M. Prevalence of oral rehydration therapy use and associated factors among under-five children with diarrhea in Dangure, Benishangul Gumuz Region, Ethiopia/2018. *BMC Res Notes*. 2019;12:67. doi:10.1186/s13104-019-4078-6
18. Agbolade M, Dipeolu I, Ajuwon A. Knowledge and use of oral rehydration therapy among mothers of under-five children in a Military Barrack in Ibadan, Nigeria. *Afr J Biomed Res*. 2015;18(1):7–15.
19. Zwisler G, Simpson E, Moodley M. Treatment of diarrhoea in young children: results from surveys on the perception and use of oral rehydration solutions, antibiotics, and other therapies in India and

- Kenya. *J Glob Health*. 2013;3(1):010403. doi:10.7189/jogh.03.010403
20. Eshete A. *Assessment of Knowledge, Practice, and Utilization of Oral Rehydration Therapy for Acute Watery Diarrheal Disease Case Management Among Mothers (Caregivers) of Under-Five Children in Assela Town, Ethiopia*. Ethiopia: Addis Ababa University; 2015.
 21. Bello UL, Yunusa U, Abdulrashid I, Muhammad MU. Comparative studies of knowledge and perception of parents on home management of diarrheal diseases among under-five children between two communities of Kano State, Nigeria. *Int J Pharm Sci Invent*. 2015;4:23–31.
 22. Amare D, Dereje B, Kassie B, et al. Maternal knowledge and practice towards diarrhoea management in under-five children in Fenote Selam Town, West Gojjam Zone, Amhara regional state, Northwest Ethiopia, 2014. *J Infect Dis Ther*. 2014;2(6):1–9.
 23. Abdinia B. Knowledge and practice of mothers in the management of children's diarrhea, in Northwest, Iran. *Arch Pediatr Infect Dis*. 2014;4(2):e17581.
 24. Ogunrinde G, Raji T, Owolabi OA, Anigo KM. Knowledge, attitude and practice of home management of childhood diarrhoea among caregivers of under-5 children with diarrhoeal disease in northwestern Nigeria. *J Trop Pediatr*. 2012;58(2):143–146. doi:10.1093/tropej/fmr048
 25. Mengistie B, Berhane Y, Worku A. Predictors of oral rehydration therapy use among under-five children with diarrhoea in Eastern Ethiopia: a community-based case-control study. *BMC Public Health*. 2012;12(1):1029. doi:10.1186/1471-2458-12-1029
 26. Amini-Ranjbar S, Bavafa B. Iranian mothers' child feeding practice during diarrhea: a study in Kerman. *J Nutr*. 2007;6(3).
 27. Merga N, Alemayehu T. Knowledge, perception, and management skills of mothers with under-five children about the diarrhoeal disease in indigenous and resettlement communities in Assosa District, Western Ethiopia. *J Health Popul Nutr*. 2015;33(1):20.
 28. Desta BK, Assimamaw NT, Ashenafi TD. Knowledge, practice, and associated factors of home-based management of diarrhea among caregivers of children attending under-five clinic in Fagita Lekoma District, Awi Zone, Amhara Regional State, Northwest Ethiopia, 2016. *Hindawi Nurs Res Pract*. 2017;2017:1–8. doi:10.1155/2017/8084548

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