

Home-based management practice of diarrhea in under 5 years old children and associated factors among caregivers in Ginchi town, Oromia region, west Ethiopia

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Gemechu Terefe¹, Rajalakshim Murugan², Tadesse Bedada²,
Girma Bacha³ and Gadisa Bekele³

Abstract

Objective: The study was aimed to assess the home-based management practice of diarrhea and associated factors among caregivers in children under 5 years old at Ginchi town, Oromia region, West Ethiopia.

Methods: A community-based cross-sectional study was conducted among 335 caregivers in Ginchi town. Data were collected using face-to-face interviewing questionnaires by using a systematic sampling technique. Data were entered into Epi-data version 3.5.1 and exported to statically software package for social science version 23.0 for analysis. Descriptive analyses were carried out. Bivariable and multivariable logistic regressions were done to identify predictors of home-based management practice of diarrhea in children under 5 years old.

Result: The study had a total of 326 participants, with a 97.3% response rate. Accordingly, 193 (59%) have a good home-based management practice of diarrhea in children under the age of 5 years. Attended elementary school (adjusted odds ratio (95% confidence interval), 0.17 (0.06, 0.47)), high school education (adjusted odds ratio (95% confidence interval), 0.04 (0.013, 0.126)), monthly income in second class (adjusted odds ratio (95% confidence interval), 0.19 (0.04, 0.94)), and being mother in child relationship (adjusted odds ratio (95% confidence interval), 1.27 (1.4, 4.20)) were the identified predictors of home-based management practice of diarrhea in children under 5 years old.

Conclusion: More than half of the respondents have a good home-based management practice of diarrhea in children under 5 years old. Caregivers' educational status, being mothers of the child, and monthly income were the identified predictors. As a result, health education and awareness programs for caregivers on diarrhea control, proper use of oral rehydration solution, home-based fluid preparation, and diarrhea prevention are critical.

Keywords

Practice, management, ORS, Ginchi, under-five children, home-based

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Introduction

Diarrhea is passing three or more loose or liquid stools per day, or more frequently than is normal for the individual. Bacteria, viruses, and parasites all have a contribution to the disease which spreads through contaminated food, polluted drinking water, or poor hygiene from person to person. The diarrheal disease is both a preventable and treatable disease.¹

Diarrhea is one of the leading causes of morbidity and mortality in children under the age of 5 all over the world, particularly in underdeveloped countries where there is a lack of knowledge and practice in the management of diarrheal

¹School of Midwifery, Faculty of Health Sciences, Institute of Health, Jimma University, Jimma, Ethiopia

²Department of Nursing and Midwifery, School of Allied Health Sciences, College of Health Sciences, Addis Ababa University, Addis Ababa, Ethiopia

³School of Nursing, Faculty of Health Sciences, Institute of Health, Jimma University, Jimma, Ethiopia

Corresponding author:

Gadisa Bekele, School of Nursing, Faculty of Health Sciences, Institute of Health, Jimma University, P.O. Box 378, Jimma, Ethiopia.

Email: gaaddisaab@gmail.com



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disease.² Every year, there are around 1.7 billion diarrheal cases among children under the age of 5 in the world, a figure that continues to be unacceptable.^{3–5} The number of children under the age of 5 who die from diarrhea is estimated to be 800,000 worldwide, with more than 80% of these deaths occurring in South Asia and Africa (46% in Africa alone).^{6,7} In South Africa, diarrhea is the third leading cause of death in children under the age of 5. These children died as a result of certain mothers'/caregivers' poor use of oral rehydration solution (ORS) at home, and their deaths were primarily caused by dehydration, which may be addressed with ORS.⁸ In Ethiopia, diarrhea is the second leading cause of death in children under the age of 5, following pneumonia, which accounted for 20% of all childhood deaths.⁹ Dehydration due to loss of fluids and electrolytes is estimated to be the main cause of diarrhea-related deaths in children under the age of 5. This dehydration due to loss of fluids and electrolytes is thought to be the cause of 60%–70% of diarrhea-related deaths in children under the age of 5.¹⁰

For effective diarrhea case management, the Integrated Management of Childhood Illness (IMCI) guidelines recommend using ORS in conjunction with continuing eating.¹¹ The management of diarrhea disease in children under the age of 5 at home is quite common among caregivers. ORS is rarely utilized in practice by caregivers at home for diarrhea management in children under the age of 5, despite its widespread acceptance for lowering dehydration caused by diarrhea.¹² This ineffective use of ORS is accompanied by improper preparation, which is due to lack of prior experience among caregivers.¹⁰ Although providing oral fluid to children with diarrheal disease reduces dehydration, some caregivers practiced limiting or even stopping fluids for children with diarrheal disease.¹²

The role of the family, especially the mother, is vital in health promotion, disease prevention, and patient care. In the actions mothers take, the minimum required is a brief and superficial examination of the dehydrated child and the amount and type of liquid fed to him or her in the case of diarrhea, even these actions are vital for pediatric welfare.¹³

Proper home-based management can reduce morbidity and mortality due to diarrhea in children under the age of 5. Most of the time, diarrhea is managed by caregivers in their homes; however, their level of management practice is poor. Similarly, their practice to use universal popular ORS in preventing dehydration due to diarrhea is also very low.^{6,13}

A study done in Ethiopia also indicates that 36.7% had poor practice toward diarrhea management which was an ignored number,^{14,15} and only 14.4% of caregivers have a good home-based management practice of diarrhea in children under the age of 5.¹⁶ However, no previous research in the study area has investigated the level of home-based diarrhea management practice among the caregivers of children under the age of 5. As a result, this study was aimed to assess home-based management of diarrhea in children under the age of 5 and factors associated among caregivers in Ginchi

town, west Ethiopia and compare with previous findings in other parts of the country and beyond.

Methods

Study area and setting

A community-based quantitative cross-sectional study design was conducted in Ginchi town from 1 April to 5 April 2017. Ginchi town is located 85 km from the capital city of Ethiopia, Addis Ababa where the town is divided into two kebeles. There were 2025 households which have children under the age of 5 and 3642 children under the age of 5 in the town according to the statistics received from the Dandi woreda health bureau. There was one public health center and two health posts and five private clinics in the town. All caregivers who had children under the age of 5 and lived in Ginchi town for at least 6 months were the source populations, and all sampled caregivers having children under the age of 5 and are willing to participate were the study population.

Eligibility criteria: All caregivers who have children under the age of 5 and who lived in Ginchi town for at least 6 months and willing to participate were included in this study, and all caregivers with major psychiatric problems and critical illness were excluded from the study.

Sample size determination. The sample size was calculated using the single population proportion formula. Since the source population is less than 10,000, the sample size was adjusted by using the finite population correction formula. Then, by considering the non-response rate of 10%, the total sample size calculated was 335. Every 6 h household was selected using systematic sampling technique and the first subject was selected by a simple random sampling technique from the first six caregivers. A proportional allocation of a sample was implemented for each kebele.

Data collection procedure and measurement. A semi-structured interviewer-administered questionnaire was used to collect data from caregivers of children under the age of 5. The tools were adapted and developed from different kinds of literature.^{17,18} First, the questionnaire was prepared in the English version and translated to Afaan Oromo and Amharic local language versions by a person who is fluent in English and then retranslated back to the English version to check the consistency.

The questionnaire contains four parts which include sociodemographic characteristics of caregivers, the second 15 questions assessed knowledge of the caregivers about diarrhea management, and the third part is 12 questions to assess attitudes of caregivers. The attitude was assessed by a 5-point Likert-type scale which corresponds with strongly disagree⁽¹⁾, disagree⁽²⁾, neither agree nor disagree⁽³⁾, agree⁽⁴⁾, and strongly agree⁽⁵⁾. The fourth part comprising 12 questions assessed caregivers' practice toward home-based diarrhea management. The overall knowledge, attitude, and practice score

were estimated by taking the average score of all subscales. This subscale score was obtained by summing the score of the item and dividing it by the total number of items. For knowledge questions, those respondents who scored above or equal to the mean have good knowledge and those respondents who scored less than the mean have poor knowledge. For attitude, the subscale was obtained by summing items score and divided by a total number of items. Above or equal to the mean of attitude statement indicates a favorable attitude, while below the mean attitude statement indicates unfavorable. For practice also subscale was obtained by summing items score and dividing by the total number of items. Caregivers who scored above or equal to the mean of practice questions were considered as good practice, while those who scored below the mean of practice questions had poor practice home-based management of diarrhea in children under the age of 5. The data were collected by four BSc nurses who were recruited as data collectors after the training was given for them. To assure the quality of data, data collectors and supervisors were trained for 1 day. The questionnaire was pretested on 5% of the sample size of a similar population outside of the study area and then necessary modification was made based on the pretest finding. The principal investigator has made an ongoing checkup each day during the data collection to ensure the quality of data by checking filled questionnaires.

Operational definition. Practice: Caregivers' action toward the management of diarrhea toward their under five years age children. Practice score considers as good and poor based on the mean score of practice questions (mean=6). Those caregivers who answered above or equal to the mean of the practice questions were measured as good practice. Those caregivers who answered below the mean of the practice questions were measured as poor practice.

Caregivers: Persons, who take care of young children, may not necessarily be their parents.

Home management of diarrhea: This refers to practices undertaken for the treatment of diarrhea at home.

Statistical analyses

Data were entered into Epi-data version 3.5.1 and exported to SPSS version 23 for analysis. Simple frequencies were done to see the overall distribution of the study participants with the different study variables. Descriptive statistics like frequencies, percentages, means, and standard deviations were performed. Bivariate logistic regression analysis was done to select candidate variables for multivariate logistic regression. Variables with a p-value less than or equal to 0.25 in the bivariate analysis were considered as a candidate to be entered in the final model; odds ratio (OR) with 95% confidence interval (CI) was calculated to see the predictor variables and p-value < 0.05 was considered statistically significant. Hosmer and Lemeshow's test was found to be insignificant, and the Omnibus test was significant, which indicates that the model was fitted.

Ethical approval and consent to participate. Ethical clearance to conduct this study was obtained from Institutional Review Board of Addis Ababa University. An official letter was written to the Oromia health bureau and Ginchi Town Health sector from the respective office. Permission from the Ginchi health sector was taken. Each study participant was adequately informed about the objective of the study and anticipated benefits and risks of the study by their data collector. Written informed consent was obtained from the subjects and the legally authorized representatives of minor subjects before the study. Respondents were also told the right not to respond to the questions if they don't want to respond or to terminate the interview at any time.

Results

Description of the study participants

Only 326 respondents out of a total of 335 responded, giving in a response rate of 97.3%. About 97 (29%) of the participants were between the ages of 30 and 34, with a mean of 4.18 and standard deviation (SD) of 1.34. More than half (55.8%) of the participants were Orthodox by religion, and 225 (69%) were Oromo by ethnicity. In terms of the marital status of respondents, about 275 (84%) were married. Concerning the educational status of the respondents, 103 (31.6%) caregivers attended elementary school. In terms of caregivers' occupations status, 193 (59.2%) were housewives and 46 (14.1%) were government employees. Regarding child caregiver's relationships, the majority of the respondents (274; 84%) were mothers, followed by grandmothers (30; 9.2%). Less than two-thirds (62%) of study participants had less than five family members. This study also revealed that 134 (41%) of caregivers were categorized under the lowest monthly income class, while 74 (23%) were under the second monthly income category (Table 1).

Knowledge of caregivers about diarrhea and its management

In this study, from those caregivers who heard about ORS, the majority of caregivers (71.2%) heard from the health center. In terms of respondents' knowledge, about 208 (63.8%) had good knowledge of home-based diarrhea management in children under the age of 5. With regard to respondents' knowledge of the cause of diarrhea, 234 (71.8%) caregivers stated that intestinal parasites are the most common cause of diarrhea in children under the age of 5. The majority of respondents (311; 96.7%) said mortality and morbidity in children under the age of 5 are due to the impact of diarrhea. More than half (54.9%) of the caregivers didn't know signs and symptoms of dehydration, while 147 (45.1%) knew dehydration signs and symptoms related to diarrhea. When it came to the importance of ORS, 169 (52%) respondents said it was used to prevent dehydration in children under the age of 5 faced diarrheal problems. On the

Table 1. Socio-demographic characteristic of the caregivers in Ginchi town, West Shawa zone, Oromia regional state Western Ethiopia, 2017.

Variables		Frequency (n = 326)	Percentage (100%)
Age	15–19	1	0.3
	20–24	21	6.4
	25–29	89	27.3
	30–34	97	29.8
	35–39	73	22.3
	40–44	23	7.1
	45–49	14	4.3
Marital status	50 and above	8	2.5
	Married	275	84
	Single	13	4
	Divorced	27	8.3
Religion	Widowed	11	3
	Orthodox	182	55.8
	Muslim	30	9.2
	Protestant	102	31.3
Ethnicity	Other ^a	12	3.7
	Oromo	225	69
	Amhara	50	15.3
	Garage	41	12.6
Educational status	Others ^b	10	3.1
	Not formal education	80	24.5
	Elementary school	103	31.6
	High school	69	21.2
Occupation	Above high school	74	22.7
	Governmental employee	46	14.1
	Private employee	39	12.0
	Housewife	193	59.2
Relation of caregiver to child	Merchant	48	14.7
	Mother	274	84.0
	Sibling	22	6.7
Family size	Grandmother	30	9.2
	Less than or equal to four	202	62
	Above five	124	38
Monthly income classification (ETB)	Lowest income (\leq 2560)	134	41
	Second lowest income (2560–3200)	74	23
	Middle income (3200–4000)	65	20
	Fourth income (4000–5000)	33	10
	Highest income (\geq 6300)	20	6

^aWakefata, Jehova, Adventist.^bTigre, Kambata.

contrary, more than half of the participants, 197 (60.4%), knew when to start ORS and 175 (53.6%) knew when to discontinue ORS.

The attitude of caregivers toward home-based diarrhea management in children under the age of 5

The mean score of attitude questions was 7. Based on the mean value, 202 (62.0%) of the caregivers had a positive attitude, while 123(37.7%) had a negative attitude toward

home-based management of diarrhea in children under the age of 5. About 58 (17.8%) caregivers strongly agreed that vaccination reduces diarrhea, while 22 (6.7%) and 76 (23.3%) strongly disagree and disagree, respectively. One hundred forty-one (43%) of caregivers agreed that ORS is better than traditional medicine for managing diarrhea. Nearly half of the study participants (156; 47.8%) strongly agreed that exclusive breastfeeding is essential for avoiding diarrhea; however, 13 (4%) of the caregivers strongly disagreed. One hundred thirty-four caregivers (41.1%) strongly agreed that ORS is a fluid that replenishes the fluid and

Table 2. Home-based management practice of diarrhea for children under the age of 5 among caregivers in Ginchi town, West Shawa zone, Oromiya regional state Western Ethiopia, 2017.

Variables	Category	Frequency	Percentage (%)
What should be given when your child has diarrhea? (N=362) (multiple responses possible)	Normal family diet	168	46.4
	Dry food like bread	174	48.1
	Coffee powder	20	5.5
What water do you use to mix ORS solution? (N=561) (multiple responses possible)	Previously boiled and cooled water	214	38.1
	Any available water	183	32.6
	Highland water	164	29.2
Homemade fluid (N=516) (multiple response possible)	Salt with water	227	44
	Rice water	190	36.8
	Soup	44	8.5
	Juice	55	10.7
If your child started diarrhea what you will do? (n=326)	Stop feeding	21	6.4
	Continues feeding	305	93.6
How often do you give fluid to your child during diarrhea? (n=326)	The same as usual	19	6
	More than usual	278	85
	Much less usual	29	9
Receive ORS solution (n=326)	Yes	245	75
	No	81	25
Frequency of giving ORS (n=326)	Once a day	13	4
	2–3 times a day	62	19
	4–5 times a day	81	24.8
	6 and above times a day	47	14
	After every loose stool	123	38
Amount of ORS during a diarrheal episode (n=326)	As much as the child can drink	220	67
	Coffee cup of 100 mL	106	32.5
Prepared ORS duration of stay	24 h (1 day)	204	62.6
	48 h (2 days)	97	29.8
	72 h (3 days)	18	5.5
	96 h (4 days)	7	2.1
Washing hands with soap before preparing ORS (n=326)	Yes	192	58.8
	No	134	41

ORS: oral rehydration solution.

electrolyte loss occurring as a result of diarrhea. About 112 (34.4%) of caregivers strongly agreed that tooth eruption causes diarrhea, while 20 (6.1%) disagreed.

Home-based management practice of diarrhea for children under the age of 5

In this study, 193 (59%) of respondents had a good home-based management practice of diarrhea for children under the age of 5. The majority of the respondents (305; 93.6%) said feeding should be continued while a child is suffering from diarrhea. Almost half (51.5%) of the caregivers provide a typical family diet, while 20 (6.1%) provide a coffee powder. About 278 (85.3%) give more fluid than normal, while 29 (9.0%) give less fluid than usual when children under the age of 5 suffer from diarrhea. Around 227 (69.6%) caregivers use salt with water, while 55 (16.9%) use juice. About 181 (55.5%) of respondents know how to correctly prepare ORS, while 145 (44%) are unsure. When asked how often caregivers delivered ORS to children under the age of

5 who had diarrhea problems, 123 (37.3%) said after passing every loose stool, while 81 (24.8%) said 4–5 times each day (Table 2).

In terms of the time, ORS start for children under the age of 5 who suffered from diarrhea problem, about 175 (54%) of the caregivers answered it should be started on the second day, while 105 (32%) stated it should be started on the first day of the diarrheal episode (Figure 1).

In this study, more than half (56%) of the caregivers correctly prepared ORS for the management of dehydration when their children under the age of 5 faced diarrhea (Figure 2).

Factors associated with home-based management of diarrhea in children under the age of 5

In bivariate analysis, age, educational status, monthly income, occupational status, knowledge of diarrhea management, attitude toward home-based diarrhea management in children under the age of 5, child relationship, and a number of children were all predictors.

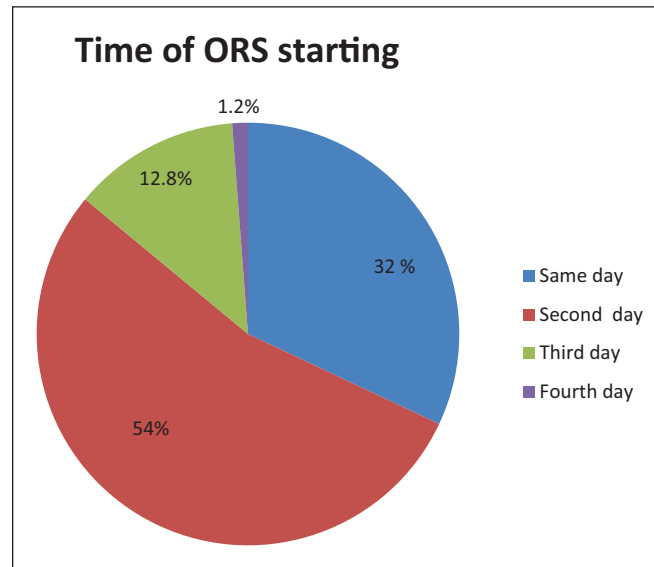


Figure 1. Time of ORS started after diarrheal episode among caregivers in Ginchi town, West Shawa, Oromia region, Ethiopia, 2017.

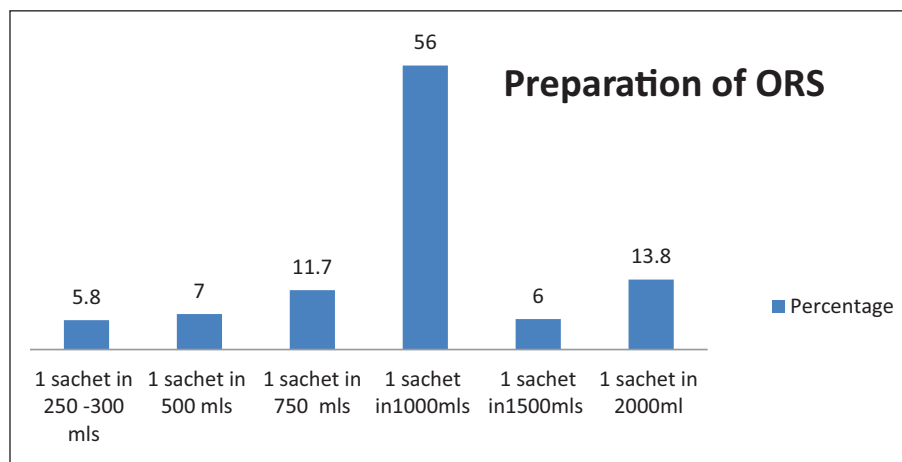


Figure 2. ORS preparation practice by caregivers in Ginchi town, West Shawa, Oromia region, Ethiopia, 2017.

Educational status, income, and child caregiver's relationship were found to be predictive in a multivariable logistic regression analysis. Accordingly, caregivers with no formal education were 96% times less likely to have good home-based management practice of diarrhea in children under the age of 5 as compared to those who attended higher educational grades (adjusted odds ratio (AOR): 0.04, 95% CI: (0.013, 0.126)). Caregivers who attended elementary school were 83% times less likely to have good home-based management practice of diarrhea in children under the age of 5 compared to those who attended higher educational grades (AOR: 0.17, 95% CI: (0.06, 0.47)). Caregivers whose monthly income was in the second income class were 81% times less likely to have good home-based management practice of diarrhea in children under the age of 5 compared to those who are classified under the highest monthly income

class (AOR: 0.19, 95% CI: (0.04, 0.94)). With regard to child relationships, those caregivers who were being mothers were 1.27 times more likely to have good home-based management practice of diarrhea in children under the age of 5 compared to those who were being grandmothers (AOR: 1.27, 95% CI: (1.4, 4.20)) (Table 3).

Discussion

This study found that 59.2% of caregivers had a good home-based management practice of diarrhea in children under the age of 5. It is almost consistent with the study conducted in Iran, which indicated (56%) mothers had good practice of diarrhea management.¹⁹ The similarity might be due to the study setup that both studies were conducted in developing countries.

Table 3. Factors associated with home-based diarrheal management practice in under 5 years among caregivers in Ginchi town, West Shawa zone, Western Ethiopia, 2017.

Variables	Home-based diarrhea management practice		COR (95% CI)	AOR (95% CI)	p-value
	Good	Poor			
Educational status					
No formal education	20 (25%)	60 (75%)	0.05 [0.02, 0.12]	0.04 [0.01, 0.12]	0.000
Elementary school	59 (57.3%)	44 (42.7%)	0.21 [0.09, 0.45]	0.17 [0.06, 0.47]	0.001
High school	50 (72.5%)	19 (27.5%)	0.41 [0.18, 0.96]	0.36 [0.13, 1.00]	0.050
Higher education	64 (86.5%)	10 (13.5%)	1.00		–
Occupation					
Government employee	37 (80%)	9 (20%)	1		–
Private employee	23 (59%)	16 (41%)	0.35 [0.13, 0.92]	0.92 [0.28, 2.97]	0.883
House wife	103 (53%)	90 (47%)	0.28 [0.13, 0.61]	1.69 [0.57, 4.98]	0.341
Merchant	30 (62%)	18 (38%)	0.41 [0.16, 1.03]	2.59 [0.77, 8.76]	0.125
Relation to child					
Mother	167 (61%)	107 (39%)	2.69 [1.23, 5.88]	1.27 [1.4, 4.20]	0.042
Sibling	15 (68%)	7 (32%)	3.70 [1.15, 11.8]	1.36 [0.33, 5.51]	0.669
Grandmother	11 (37%)	19 (63%)	1.00	1.00	–
Monthly income					
Lowest income	69 (52%)	65 (48%)	0.12 [0.26, 0.53]	0.32 [0.06, 1.59]	0.164
Second income	36 (49%)	38 (51%)	0.11 [0.02, 0.49]	0.19 [0.04, 0.94]	0.042
Middle income	42 (65%)	23 (35%)	0.20 [0.43, 0.95]	0.23 [0.05, 1.16]	0.075
Fourth income	28 (85%)	5 (15%)	0.62 [0.11, 3.56]	0.49 [0.08, 3.10]	0.453
Highest income	18 (90%)	2 (10%)	1.00		–

COR: crude odds ratio; CI: confidence interval; AOR: adjusted odds ratio.

However, this study finding was lower compared with the study conducted in Karachi (75.5%) which had a good practice on diarrhea management and ORS preparation.¹ This disparity could be due to the research populations' diverse socioeconomic backgrounds, as well as the use of varied sampling procedures used for instance convenient sampling, hospital-based use in Karachi, and small sample size. On the contrary, this study was higher than the study conducted in Ethiopia (45.9%) and Lahore Pakistan (39.3%) of the mothers who had good practice toward management of diarrhea in children under the age of 5.^{14,20} The possible explanation for this discrepancy might be because of different settings or study periods and hospitals, based on a case of study findings in Pakistan.

In this study, caregivers who were with formal education and attended elementary school were 96% and 83% times less likely to have a good home-based management practice of diarrhea in children under the age of 5 compared to those who attended higher educational grades. The finding is consistent with studies conducted in Ethiopia, Fenote Selam, and India.^{14,18} The possible explanation is because a high educational level can help to understand how preparing ORS and managing diarrhea is better than at a lower level.

The monthly income of respondents was another predictor significantly associated with diarrhea management in children under the age of 5 among caregivers. Caregivers who are in the second class of monthly income were 81%

times less likely to have good home-based diarrheal management practice in children under the age of 5 compared to those who are classified under the highest class of monthly income. It is in line with a study conducted in India in which there is a significant association with the monthly income of mothers toward diarrheal management practice.¹⁸ The possible reason because diarrhea should be treated with an ORS, a solution of clean water, sugar, and salt. In addition, a 10- to 14-day supplemental treatment course of dispersible 20mg zinc tablets shortens diarrhea duration and improves outcomes. These materials are usually not locally available needs for buying. So those who have high monthly income can buy easily for home-based diarrhea management in children under the age of 5.

Finally, the other factor that is significantly associated with home-based diarrhea management practice in children under the age of 5 is being a mother. Those who were being mothers were 1.27 times more likely to have a good home-based management practice of diarrhea in children under the age of 5 compared to those who are grandmothers in the child care relationship. The possible explanation may be because the mother is everything for her child and gives everything for her child, and also she stays with her child for a long time. They provide breast milk for their children that reduces the incidence of diarrheal disease more than others. The limitation is that the study relied on self-reported performance rather than observed diarrheal

management procedures. As a result, there was a possibility that respondents might report what was required of them, but their actual activities in some areas could differ. Likely, certain caregivers won't remember all the facts (recall bias). Since this was a cross-sectional analysis, the possibilities were limited.

Conclusion

More than half of the respondents had good practice toward home-based management of diarrhea in children under the age of 5. Attending high education, having a high income, and being mothers in child relationships were found to have a significant association with home-based management of diarrhea in children under the age of 5 among caregivers. Strengthen health education and knowledge among caregivers on diarrhea management, including the proper use of ORS, home-based fluid preparation, diarrhea prevention, and the signs of dehydration.

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Author contributions

G.T. and G.B. conceived and designed the protocol. G.B. contributed to developing a proposal, data analysis, and checked the draft. G.T. and G.B. prepared the manuscript. All authors read and approved the final paper.

Availability of data and materials

Data will be available upon request from the corresponding author.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Ethical clearance to conduct this study was obtained from Institutional Review Board of Addis Ababa University (SOM/DRERC/BCHM/053/2017).

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Informed consent

Written informed consent was obtained from the subjects and the legally authorized representatives of minor subjects before the study.

ORCID iDs

Gemechu Terefe  <https://orcid.org/0000-0003-3248-6343>

Gadisa Bekele  <https://orcid.org/0000-0001-7359-1524>

Supplemental material

Supplemental material for this article is available online.

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