

Feeding Practice During a Diarrheal Episode and Associated Factors Among Mothers/Caregivers with 6–59-Month-Old Children Visiting Health Centers in Shanan Dhuggo District, West Hararge Zone, Oromia Region, Ethiopia

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Background: Continued feeding and increasing fluids is the cornerstone treatment package for a child with acute diarrhea. However, there is a deficiency of evidence on child feeding practice during a diarrheal episode globally and particularly in low-income countries. This study aimed at assessing feeding practice during diarrheal episodes and associated factors among mothers/caregivers with 6–59-month-old children visiting health centers in Shanan Dhuggo district, West Hararge zone, Oromia region, Ethiopia.

Methodology: A facility-based cross-sectional study was conducted from March 10 to April 25, 2019 on 422 mothers/caregivers of children 6–59 months of age with diarrhea. Data collection was conducted using a pretested tool. Epi Data version 3.1 was utilized for data entry and it was transported to SPSS version 20 for analysis. Descriptive statistical analysis was conducted, and a relationship between outcome variables and independent variables were examined using logistic regression models.

Results: The overall magnitude of appropriate feeding practice during a diarrheal episode was 40.8%. Child's sex being male [AOR = 2.65 95% CI: (1.34, 5.22)], child's age <24 months [AOR = 13.5, 95% CI: (5.98, 30.45)], postnatal care visit [AOR = 4.12, 95% CI: (1.78, 9.52)], having only one under-5 child [AOR = 5.65, 95% CI: (2.78, 11.48)], information on child feeding from health workers [AOR = 4.78, 95% CI: (1.05, 21.66)], and good knowledge on child feeding [AOR = 2.96, 95% CI: (1.52, 5.77) were independent predictors of appropriate feeding practice during a diarrheal episode.

Conclusion: In the current study, the prevalence of appropriate feeding practice during a diarrheal episode was moderate. However, health education intervention aiming at factors influencing child feeding practices is indispensable to further improve feeding practice during a diarrheal episode.

Keywords: feeding practice, diarrheal episode, children and Ethiopia

Introduction

Worldwide, diarrhea is the second most prominent reason for under-five mortality. Diarrhea is also one of the principal causes of childhood morbidity and death in developing countries.^{1,2} In Ethiopia, 28% of hospital admissions are because of diarrheal disease and the country is one of the top five countries with the highest

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diarrheal disease burden globally.^{3,4} Diarrhea removes essential body fluids and vital nutrients resulting in dehydration and malnutrition as a complication.⁵ Diarrhea can last several days, depriving the body of water and electrolytes that are essential for existence.⁶

In order to minimize mortality and morbidity resulting from diarrheal diseases, the World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) have recommended continued feeding and fluid replacement as an intervention for management of diarrhea at home by caregivers.^{7,8} Fluid replacement and continued feeding have an influential effect on controlling complications and recovery from diarrheal disease. Yet, only 39% and 35% of under-five children with diarrhea get fluid replacement in developing countries and Africa, respectively.⁸ The Ethiopian Demographic Health Survey 2016 (EDHS) showed that only 15% of under-five children with diarrhea were given more liquids than usual, 21% received the usual amount of liquids, and 33% received even less liquids than usual.⁹

Moreover, there are clues that risky practices like fluid restriction and breastfeeding reduction in treating diarrhea are used by caretakers during diarrheal episodes.¹⁰ Previous studies revealed that 31, 25, and 11% of mothers give nothing, halt breastfeeding and decrease fluid administration during diarrheal episodes, respectively.^{3,11,12} Since mothers play a crucial role in their children's nutritional status and growth, their feeding practices have a direct effect on those children's nutritional outcomes, particularly during diarrheal episodes. Their socioeconomic condition significantly influences the health status of their children and outcome of diarrhea episodes.¹³

There is a plenty of study done on the feeding practice of healthy infants and children. Conversely, only little is known about child feeding practice of caregivers during illness episodes, particularly during deadly diarrheal disease episodes in Ethiopia. Obviously without concrete evidence on prevalence and factors affecting feeding practice of caretakers during diarrheal episodes among caregiver of under-five children, it is unthinkable to formulate feasible and effective intervention schemes. Hence, this study aimed at assessing feeding practice during diarrheal episodes and associated factors among mothers/caregivers with 6–59-month-old children visiting health centers in Shanan Dhuggo district, West Hararge zone, Oromia region, Ethiopia.

Methods

Study Design and Study Area

A facility-based cross-sectional study was conducted from March 10 to April 25, 2019 in Shanan Dhuggo district, West Hararge, Oromia region, Ethiopia. The district has 7 public health centers and 26 health posts. Based on the projections of the 2007 population and housing census, the population in the district is estimated to be 208,991. Out of the total estimated population, there are 105,958 males and 103,033 females. About 7865 people live in urban areas and 201,126 live in rural areas. There were 31,349 children aged 6–59 months and 46,250 women of reproductive age.¹⁴

Study Participants

The study population was all mothers/caregivers of children aged 6–59 months of age with diarrhea and who visited the health centers in Shanan Dhuggo district during the data collection period. Mothers/caregivers who did not volunteer to participate in the study were excluded.

Sample Size Determination and Sampling Procedure

The sample size for this study was calculated using a formula for a single population proportion considering a 95% confidence interval level, and assumed the prevalence (50%), margin of error (5%), and non-response rate (10%); the final sample size was 422. All patient flow of 6–59-month-old children with diarrheal episodes in the last two consecutive years of the same period of data collection was taken from the monthly Health Management Information System (HMIS) registration book of each health center. The average data of the two-year patient flow was used as a baseline to allocate the study participants for each health center and allocation was made accordingly. The participants were selected using a systematic random sampling technique to ensure representativeness.

Data Collection Tool and Procedure

The tool was adapted from relevant literature. The tool included: sociodemographic characteristics of study participants and index child; health care service utilization characteristics; and knowledge and feeding practices of mothers/caregivers during diarrheal episodes. The socio-demographic details of study participant and index child covered: age of mother/caregiver in complete years, place

of residence, educational level, religion, occupation, average monthly income of household, number of under-five children in the household, age of index child in complete months and duration of last illness in days. Health care utilization characteristics covered: whether or not participants received information from health care workers on child feeding practices and utilization of maternal health care like PNC and ANC. For the knowledge part of the study, maternal/care knowledge was assessed using 10 questions related to components of infants and young children's food, oral rehydration and feeding practice during diarrheal episode. Finally, feeding practice during a diarrheal episode was addressed by four criteria: giving more food than usual, increasing frequency of breastfeeding, increasing frequency of food, and increasing frequency of fluids.

Before actual data collection, a pretest on 5% of the sample was conducted and necessary adjustments were made. Eight nurses were recruited: seven diploma nurses for data collection and one BSc nurse for supervision. The data collectors and supervisor received training on the study's objectives 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

Feeding Practice During Diarrheal Episode

Feeding practice during a diarrheal episode was measured by four criteria: giving more food than usual, increasing frequency of breastfeeding, increasing frequency of food, and increasing frequency of fluids. If a mother/caregiver practiced at least three of the criteria, it was considered as appropriate feeding practice.^{9,15}

Diarrheal Episode

An episode was defined as three or more loose stools per day, and/or blood in the stool on any day, or as defined by the caregiver.¹⁶

Knowledge

Mothers/caregivers answering more than half of the knowledge questions were categorized as having good knowledge, whereas mothers/caregivers answering less than half were considered as having poor knowledge.^{17,18}

Data Processing and Analysis

Consistency and completeness of responses in the questionnaires were checked first. Data were pre-coded manually, entered into Epi Data Version 3.1, then transferred to SPSS version 20 for analysis. During analysis, the 10 knowledge questions were recoded as yes =1 and no = 0 to make the variables dichotomous. Next, the coded responses were computed to get the mean response to the 10 knowledge questions. After that, the mean responses to five knowledge questions were computed to get the overall mean response to the 10 knowledge questions. Finally, those responses above the mean were coded as 1 = knowledgeable and 0 = not knowledgeable. Related duration of current illness in days was categorized as ≥ 2 weeks or < 2 weeks. Average household income was categorized as < 1000 , $1000-3000$, or > 3001 in Ethiopian birr.

Data editing was done after data entry by running frequencies then checking for missing values and outliers. Descriptive statistical analysis including frequencies and proportions was used to summarize variables. Bivariate analysis between dependent and independent variables was done using binary logistic regression. The collinearity effect was checked by variance inflation factor (VIF) and non-collinear covariates were included in the independent final binary logistic regression model to assess the possible association of outcome variables. All covariates that are significant at p-value < 0.25 in bivariate analysis were considered for multivariate analysis to control all possible confounders. Odds ratios along with 95% intervals were estimated to identify factors associated with the outcome variable using multivariate logistic regression. The level of statistical significance was declared as a p-value of less than 0.05. The fitness of the model was tested using the Hosmer–Lemeshow goodness of fit test for feeding practice during a diarrheal episode.

Ethical Considerations

Ethical clearance was acquired from the Institutional Health Research Ethics Review Committee (IHRERC) of the College of Health and Medical Sciences of Haramaya University and it was given to Shanan Dhuggo District Health Office. Then the District Health Office gave a written permission letter to each health center. Written or fingerprint consent was taken from the mother/caregiver. The participants were assured that it was their right to decide whether or not to participate. The participants were encouraged to be honest as much as possible since the information is useful and very important to the district, the

region, and the country at large. The confidentiality of the participants was maintained by excluding their names from the questionnaire. The study was conducted according to the Declaration of Helsinki.

Results

Sociodemographic Characteristics

A total of 414 mothers/care givers with 6–59-month-old children with diarrhea were included in the analysis, giving a response rate of 98%. The mean age of mothers/caregivers and children was 26.44 (± 4.1 SD) years and 22.79 (± 12.42 SD) months, respectively. The majority of mothers/caregiver (89.6%) were housewives and almost three-quarters (70%) were Muslims. More than half (56.8%) of the respondents had no formal education (Table 1).

Health Care Service and Utilization Characteristics

Nearly half of the study participants (48.8%) received fewer than four antenatal care (ANC) visits during pregnancy and the majority of them (70.3%) received no post-natal care (PNC) visit after delivery. More than half, 233 (56%), of study participants did not get information on child feeding during a diarrheal episode from health care workers. A little more than one-third of total respondents (35.5%) had good knowledge on feeding during a diarrheal episode (Table 2).

Feeding Practices During a Diarrheal Episode and Mother/Caregiver Knowledge

Among study participants, 40.8% followed appropriate feeding practice during a diarrheal episode. Just over a third (36%) of study participants increased the frequency of breastfeeding during a diarrheal episode. A little under a third (30%) of respondents increased frequency of fluid intake and the same percentage also increased frequency of food intake during a diarrheal episode. Regarding the amount of food given, 30, 55.1, and 15% of children received more than usual, the same amount and less than the usual amount, respectively, during a diarrheal episode (Figure 1).

Factors Associated with Feeding Practices During a Diarrheal Episode

In multivariate logistic analysis, mothers who got information from health care workers were 4.8 times more likely to

Table 1 Sociodemographic Characteristics of Study Participants, Shanan Dhuggo District, West Hararge, Oromia Region, May 2019 (N = 414)

Characteristics	Category	Frequency	Percentage (%)
Age of mother/caregiver	<20	34	8.2
	20–29	288	69.6
	30–39	92	22.2
Residence	Urban	48	11.6
	Rural	366	88.4
Religion of mother	Orthodox	91	22
	Protestant	33	8
	Muslim	290	70
Mothers occupation	Housewife	371	89.6
	Merchant	24	5.8
	Government employee	19	4.6
Educational level	No formal education	235	56.8
	Primary school (1–8)	86	20.8
	Secondary school (9–12) and above	93	22.5
Average household income (in ETB)	<1000	306	73.9
	1001–3000	78	18.8
	>3001	30	7.2
Sex of child	Male	154	37.2
	Female	260	62.8
Age of child in months	<24	267	64.5
	≥ 24	147	35.5
Number of under-5 children	1	131	31.6
	≥ 2	283	68.4
Duration of current illness	<2 weeks	396	95.7
	≥ 2 weeks	18	4.3

Abbreviation: ETB, Ethiopian birr.

practice appropriate feeding as compared to their counterparts [AOR = 4.78, 95% CI: (1.05, 21.66)]. Mothers who had good knowledge were more likely to practice appropriate feeding [AOR = 2.96, 95% CI: (1.52, 5.77)]. Those mothers who had only one child under five were 5.7 times more likely to practice appropriate feeding as compared to those who had two or more children [AOR = 5.65, 95% CI: (2.78, 11.48)]. Mothers who had received PNC visits were more likely to practice appropriate feeding [AOR = 4.12,

Table 2 Health Service Care and Utilization Characteristics About Feeding Practice During a Diarrheal Episode of Mothers/ Care Givers with Children 6 –59 Months of Age in Shanan Dhuggo District, West Hararge, Oromia Region, May 2019 (N = 414)

Characteristics	Category	Frequency	Percentage (%)
Get information from health care worker about child feeding practice	Yes	181	43.7
	No	233	56.3
Maternal knowledge about feeding	Good	147	35.5
	Poor	267	64.5
ANC	No visits	104	25.1
	1-3 visits	202	48.8
	≥4 visits	108	26.1
PNC	No visits	291	70.3
	Has visits	123	29.7

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

95% CI: (1.78, 9.52)]. Those mothers whose child was aged less than 24 months were more likely to practice appropriate feeding during a diarrheal episode [AOR = 13.5, 95% CI: (5.98, 30.45)]. Mothers who had a male child were 2.6 times more likely to practice appropriate feeding during a diarrheal episode compared to their counterparts [AOR = 2.6, 95% CI: (1.34, 5.22)] (Table 3).

Discussion

The study revealed that, among mothers/caregivers with 6–59-month-old children with diarrhea, 40.8% followed appropriate feeding practice during the diarrheal episode.

Furthermore, maternal knowledge on child feeding, getting information from health care worker, PNC visit, number of under-5 children, age and sex of index child were significantly associated with feeding practices during diarrheal episodes among mothers/caregivers.

The magnitude of appropriate feeding in this study (40.8%) was lower than in a study conducted in Gamo Gofa zone, Southern Ethiopia (70.7%).¹⁵ The difference might be due to the fact that the previous study targeted mothers/caregivers with children age less than two years, whereas the target of the current study extended to mothers/caregivers with children under five years of age. However, the finding of this study was higher than that identified in a study conducted in Karachi, Pakistan, 26.2%.¹⁰ This may be due to cultural differences in the study settings.

Improved contact with health facilities and health workers creates an upsurge in information linked to health promotion and prevention. The findings of this study showed that mothers who had PNC visits were more likely to practice appropriate feeding. This could be due to the fact that increased exposure to health facilities increases the receipt of health-related information from health workers, including on feeding practice during diarrheal episodes. This implies that maternal health care services indirectly contribute to the quality of feeding practices. This study also revealed that getting information from health care workers showed a significant association with feeding practice during a diarrheal episode. This could be due to the fact that information from health workers has the potential to enhance maternal knowledge, which in turn improves feeding practices.

Consistent with a study conducted in Iran,¹⁹ mothers who had good knowledge about feeding were more likely

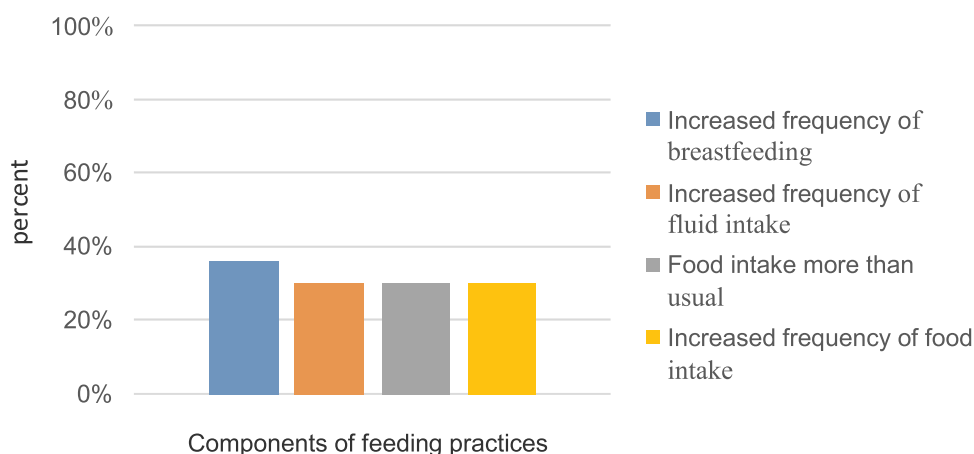


Figure 1 Feeding practices during a diarrheal episode among mother of children 6–59 months of age, Shanan Dhuggo District, West Hararge Zone, Oromia Region, May 2019 (N = 414).

Table 3 Factors Associated with Feeding Practice During a Diarrheal Episode Among Mothers with Children 6–59 Months of Age, Shanan Dhuggo District, West Hararge Zone, Oromia Region, May 2019 (N = 414)

Variables	Appropriate Feeding Practice During Diarrheal Episode		COR(95% CI)	AOR(95% CI)	p-value
	Yes	No			
Age of child in months <24 ≥24	152(36.7) 17(4.1)	115(27.8) 130(31.4)	10.11(5.77, 17.70) 1	13.5(5.98, 30.45) 1	0.001**
Sex of child Male Female	106(25.6) 63(15.2)	48(11.6) 197(47.6)	6.91(4.4, 10.7) 1	2.65(1.34, 5.22) 1	0.004**
Number of under-5 children 1 ≥2	101(24.4) 68(16.4)	30(7.2) 215(51.9)	10.65(6.52, 17.38) 1	5.65(2.78, 11.48) 1	0.001**
Residence Urban Rural	35(8.5) 134(32.4)	13(3.1) 232(56.0)	4.66(2.38, 9.12) 1	0.6(0.183, 1.973) 1	0.32
PNC Has no visit Has 1-3 visits	68(16.4) 101(24.4)	223(53.9) 22(5.3)	1 15.06(8.82, 25.71)	1 4.12(1.78, 9.52)	0.001**
Get information from health care workers Yes No	125(30.2) 44(10.6)	56(13.5) 189(45.7)	9.59(6.08, 15.11) 1	4.78(1.05, 21.66) 1	0.044**
Get information from media Yes No	19(4.6) 150(36.2)	7(1.7) 238(57.5)	4.31(1.77, 10.49) 1	4.27(0.70, 25.86) 1	0.113
Maternal knowledge Good Poor	96(23.2) 73(17.6)	51(12.3) 194(46.9)	5.002(3.24, 7.72) 1	2.96(1.52, 5.77) 1	0.001**

Note: **Significant at p-value <0.05.

Abbreviations: ANC, antenatal care; PNC, postnatal care AOR, adjusted odds ratio; COR, crude odds ratio; CI, confidence interval.

to practice appropriate feeding practice during a diarrheal episode than their counterparts. This might be due to the fact that having information and awareness was an entry point to the development of knowledge, which suggests that having good knowledge contributes to better feeding practice during a diarrheal episode.

This study showed that mothers who have one under-five child practiced appropriate feeding as compared to those who have two or more under-five children; this is supported by a study conducted in Gamo Gofa, Southern Ethiopia.¹⁵ This might be due to the fact that, as the number of under-five children increases in the household, the care given to the children decreases, which places a strain on family

resources that leads to diminished child care practices. This indirectly suggests that birth spacing through proper family planning advances feeding practice during diarrheal episodes.

This study revealed that mothers/caregivers with children aged <24 months were more likely to appropriately feed their children during a diarrheal episode compared to those mothers/caregivers with older children. The reason could be due to the fact that, as they grow older, children want to enjoy their autonomy and may refuse feeding. This requires mothers/caregivers to implement active and responsive feeding practices for children aged two and above, which requires more patience to encourage them to feed during illness.

Moreover, in line with the study conducted in Gamo Gofa,^{15,20} in the current study participants who had boys were 2.6 times more likely to practice appropriate feeding during a diarrheal episode than those who had girls. This could be due to the preference for boys in developing countries. This issue needs urgent attention through health education to avoid discrimination. The gender bias should be dealt with in a sensitive manner through counseling and motivation.

The limitations of this study include: recall bias and social desirability bias; its cross-sectional approach, which might make it difficult to identify cause and effect relationships; and its failure to include some important variables like type and location of delivery. Lastly, there was a scarcity of literature on feeding practices during diarrheal episodes which could have an effect on discussion and interpretation of the findings.

Conclusion

This study has shown that appropriate feeding was moderately practiced. The number of under-five children, having postnatal care visits, sex of child, child's age, getting information from health care workers and maternal knowledge about feeding are significantly associated with appropriate feeding practice during a diarrheal episode. Therefore, programmers, policy makers and stakeholders who are working on child health programs should design health interventions that aim at factors influencing child feeding practices. This approach is indispensable to further improve child feeding during a diarrheal episode.

Abbreviations

AOR, Adjusted odds ratio; COR, crude odds ratio; CI, confidence intervals; HIT, health information technician; SPSS, Statistical Package for Social Sciences; ANC, antenatal care; PNC, postnatal care; WHO, World Health Organization; UNICEF, United Nations International Children's Emergency Fund; EDHS, Ethiopian Demographic Health Survey; IHRERC, Institutional Health Research Ethics Review Committee.

Acknowledgments

The authors would like to express their sincere gratitude to Shanan Dhuggo District Health Office for their cooperation during data collection. Authors are also thankful to the mothers/caregivers who gave their cherished time during data collection.

Author Contributions

All authors approved the final version of the manuscript to be published. All authors contributed to data analysis, drafting or revising the article, have agreed on the journal to which the article will be submitted, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

Disclosure

All authors declare that there are no competing interests.

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