Prevalence and factors associated with acute diarrheal disease among under-five children in Halaba Special District, Southern Ethiopia

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ABSTRACT:

Background: *Diarrheal disease remains the leading cause of morbidity and mortality among under-five children worldwide. It is one of the top leading causes of under-five morbidity & mortality in Ethiopia. Identifying the determinants of a disease enables to design an effective intervention. The main objective of this study was to assess the prevalence and associated factors of acute diarrheal disease among under-five years of age in Halaba Special District Southern Ethiopia.*

Methods: *Community-based cross-sectional study was carried out in 2021. Five hundred thirty mothers/care givers with under-five children were selected by using systematic random sampling from selected kebeles in the district. Data were collected using structured and pre-tested questionnaires. Data were cleaned and analyzed using SPSS version 20. Bivariate and multivariate analysis were done to assess factors affecting diarrhea.*

Results: *The mean ages of the respondents and the index children were 33.30(+6.26SD) years and 22.75 (+12.79SD) months, respectively. Prevalence of acute diarrheal disease over a period of two weeks preceding the study was 21.3%. Water source [AOR: 4.476, 95% CI (1.962, 10.210)], distance to water source [AOR: 2.252, 95% (1.139, 4.451)], feces seen outside the pit hole of latrines [AOR: 2.943, 95% (1.347, 6.429)], mothers/care givers who feed adult food to the children [AOR: 6.985,95 % (1.074, 45,433)] and bottle feeding [AOR: 8.269 ,95% (1.086, 62.975)] were significantly associated with acute diarrheal disease.*

Conclusions and recommendations: *Acute diarrhea is prevalent in children under five, linked to improper latrine use, unsafe drinking water sources, distance to water sources, and inadequate food and feeding practices. Recommendations to mitigate this include improving water sources, promoting proper latrine use, educating on appropriate food and feeding, and implementing health education programs on household hygiene, sanitation, and behavior.*

Keywords: *Acute diarrheal disease, Associated factors, Halaba Special District, Prevalence Under-five children*

አጎድሮተ ጥናት

የጥናቱ ዳራ፡ *የተቅማጥ በሽታ በዓለም አቀፍ ደረጃ ከአምስት ዓመታት በታች ለሆኑ ህጻናት ለበሽታ እና ለሞት የሚዳርግ ዋነኛ መንስኤ ሆኖ ቀጥሏል። በኢትዮጵያም በዚህ የእድሜ ክልል ውስጥ ላሉ ህጻናት ህመም እና ሞት ከዋነኛ መንስኤዎች አንዱ ነው. የበሽታውን መንስኤዎች ማወቅ ውጤታማ የሆነ መከላከያ ስልቶችን ለመንደፍ ያስችለናል. የዚህ ጥናት ዋና አላማ በደቡብ ኢትዮጵያ በሀላባ ልዩ ወረዳ ከአምስት ዓመታት በታች የሆኑ ህጻናት የአጣዳፊ ተቅማጥ በሽታ ስርጭት ማወቅና እና ተያያዥ ምክንያቶችን መለየት ነው።*

የጥናቱ ዘዴዎች፡- *ጥናቱ በአምስት መዶ ሰላሳ እናቶች/ተንከባካቢዎች በወረዳው ከሚገኙ ቀበሌዎች ስልታዊ የዘፈቀደ ናሙና በመጠቀም ነው። መረጃ የተሰበሰበው የተዋቀሩ እና አስቀድሞ የተሞከሩ መጠይቆችን በመጠቀም ነው። መረጃው የSPSS ስሪት 20ን በመጠቀም ተጠርጓል እና ተተነተነ። ተቅማጥን የሚያስከትሉ ሁኔታዎችን ለመገምገም የሁለትዮሽ እና የባለብዙ ልዩነት ትንተና ተካሂዷል።*

የጥናቱ ውጤቶች፡ *የመላሾች እና የጠቋሚ ልጆች አማካይ ዕድሜ 33.30(+6.26SD) ዓመታት እና 22.75(+12.79SD) ወራት እንደቅደም ተከተላቸው ነበር። ከጥናቱ በፊት ባሉት ሁለት ሳምንታት ውስጥ የተቅማጥ በሽታ ስርጭት 21.3% ነበር። የውሃ ምንጭ [AOR: 4.476, 95% CI (1.962, 10.210)], የውሃ ምንጭ ርቀት (AOR: 2.252, 95% (1.139, 4.451)], ከመጸዳጃ ጉድጓድ ጉድጓድ ውጭ የሚታየው ሰገራ [AOR: 2.943, 1.49] እናቶች/ተንከባካቢዎች የአዋቂዎችን ምግብ ለልጆች የሚመገቡ [AOR: 6.985,95 % (1.074, 45,433)] እና ጠርሙስ መመገብ [AOR: 8.269,95% (1.086, 62.975)]] በባለብዙ ልዩነት ትንታኔዎች ላይ ጉልህ ተዛማጅ ተለዋዋጮች ነበሩ።*

የጥናቱ ማጠቃለያ እና ምክሮች፡ *ከአምስት ዓመታት በታች በሆኑ ህጻናት ላይ አጣዳፊ ተቅማጥ በስፋት ይታያል። ይህም ተገቢ ባልሆነ የሽንት ቤት አጠቃቀም፣ ደህንነቱ ያልተጠበቀ የመጠጥ ውሃ ምንጮች፣ ከውሃ ምንጭ ያለው ርቀት እንዲሁም በቂ ያልሆነ ምግብና የአመጋገብ ልምዶች ጋር የተያያዘ ነው። ይህንን ለመቀነስ ከሚመከሩት ነገሮች መካከል የተሻሻሉ የውሃ ምንጮችን ማቅረብ፣ ትክክለኛ የሽንት ቤት አጠቃቀምን ማበረታታት፣ ስለ ተገቢ ምግብና አመጋገብ ማስተማር፣ እና የቤት ውስጥ ንፅህናን፣ የንፅህና አጠባበቅንና የባህሪ ልምዶችን በተመለከተ የጤና ትምህርት ፕሮግራሞችን ተግባራዊ ማድረግ ይገኙበታል።*

ቁልፍ ቃላት:- *አጣዳፊ የተቅማጥ በሽታ፣ተያያዥ ምክንያቶች፣ ሃላባ ልዩ ወረዳ፣ ስርጭት፣ ከአምስት ዓመታት በታች የሆኑ ህጻናት*

INTRODUCTION

Diarrhea is defined as an increased in the frequency of stools over what is normal (at least three times per day or more) and stools are not formed (i.e. loose or watery[1]. iarrhea is a significant threat to young children's health, as severe dehydration from it can lead to serious illness and even death. It also makes children more vulnerable to malnutrition, which in turn increases their susceptibility to other infections. This cycle significantly contributes to illness and mortality, especially in children under five.[2].

Diarrheal diseases have responsible for an estimated of 3-5 billion diarrheal illnesses and 5-10 million diarrhea-related deaths per year among under 5 children [3], majority of these cases are found in Africa, particularly Sub-Saharan Africa, Asia, and Latin America. In Africa alone, diarrhea accounts for 25-75% of all childhood illnesses, about 14% of outpatient visits, and 16% of hospital admissions[4, 5, 6].

The World Health Organization estimates that 88% of all diarrheal diseases stem from unsafe water, inadequate sanitation, and poor hygiene. Globally, over a billion people still lack access to improved water sources [6]. Even though oral rehydration therapy (ORT) can easily treat diarrhea, exposure to the agents that cause it can lead to a severe form of the illness. This is often linked to using contaminated water, poor hygiene practices in food preparation, and inadequate excreta disposal [7, 8]. Severity is worsened by many factors, including the agent itself and how pathogenic it is, as well as host characteristics like immunodeficiency and age. [9]

In Ethiopia, an acute diarrhea is one of the major causes of morbidity and mortality of under-five children that leads to severe dehydration and malnutrition end up with long term effect of mental retardation and creating considerable demand for health service [1, 10]. More than half of millions children die each year from diarrhea related dehydration in Ethiopia[4]. It is one of the top leading causes of under-five morbidity and mortality in Ethiopia for decades. Diarrheal diseases have been persistently reported as the first causes of under-five visits to health facilities in the country[11,12].

According to the Ethiopian Demographic and Health Survey 2005, the two week period prevalence of diarrhea among under five children was estimated to be 18%[13].

In developing countries behavioral, socio-economic and environmental factors influence child morbidity [5]. A study conducted in Southern Ethiopia indicated that the occurrence of diarrhea is associated with, lack of latrine ownership , lack of home-based water treatment , lack of improved water source and consumption of left –over food[14]. Access to medical care, improved hygiene, sanitation, safe drinking water, exclusive breastfeeding, and vaccines that prevent rotavirus are the critical component for diarrheal disease control [15].

Previously, there was a lack of studies evaluating the connections between childhood diarrhea and socio-demographic, socio-economic, environmental, and behavioral factors in the SNNPRS region, particularly in the Halaba district. Therefore, this study aimed to determine the prevalence of diarrhea among children under five and its relationship with these various factors.

METHODS

Study design and setting

A community-based cross-sectional study was carried out in Halaba Special Woreda, Southern Ethiopia, between March and April 2021. This woreda is geographically situated 315 kilometers southwest of Addis Ababa, Ethiopia's capital, and 89 kilometers south of Hawassa, the capital city of the SNNP regional state.

Sample Size

Single population proportion formula was used to determine the sample size for the first objective using Open Epi version 7 and considering the following assumptions: 95% confidence level (1.96), Margin of error (0.05), expected prevalence of children with diarrhea from similar study conducted in Arbaminch district 19.6% (25) ,we had been consider 5% margin of error for P= 19.6%,design effect of 2 and adding 10% of the none respondent's. The final sample size was 530

Sampling Procedure

Multi-stage sampling procedures were used; first by selecting 16 kebeles (more than 20%) from the total seventy-nine (79) kebeles using lottery method. From a total of 2582 households with under- 5 children in the selected kebeles were registered from family folders. Households were allocated to each Keble based on proportional to size, then systematic sampling (every kth household), (k was determined by, study population (2582 HH)/sample size (530) =5), from households with under- five children was identified and register sequentially using family folders in the kebeles were include for the study. In case, where there were more than one under-five children in the same household, only one child was selected by lottery method to take information on child's health characteristics. Similarly in case, where there was more than one mothers/ care givers of under-

five children in the same households, only one mothers/care givers was select by lottery methods.

Data Collection Tool and Procedure

Data was gathered using a standard questionnaire based on WHO/UNICEF and EDHS guidelines. To ensure accuracy, the questionnaire was initially drafted in English, then translated into Amharic (the local language), and finally translated back into English to verify consistency.

The primary respondents were mothers of children under five, but if a mother was unavailable, the child's next primary caregiver was interviewed. A pretest, involving 5% of the intended respondents, was conducted in a different kebele within Halaba Special District. The findings from this pretest helped refine and clarify ambiguous questions and statements.

Five diploma-level clinical nurses served as data collectors, while two supervisors (a Health Officer and a BSC nurse) received two days of training. Data was collected through house-to-house visits and interviews with mothers or caregivers of children under five. Supervisors and the principal investigator oversaw the data collection process, meticulously checking questionnaires daily for consistency, clarity, and completeness. Any incomplete or inconsistent data was identified and corrected on the spot.

Study Variables

Outcome (Dependent) Variable

Prevalence of acute diarrhea (Yes/No)

Explanatory (Independent) Variable

Demographic & Socioeconomic status: income, place of residence, household size, maternal age, age of the child, maternal education, ethnicity, number of children, occupation, marital status, religion, etc.

Environmental & sanitation: type of water source, distance to the water source, amount of daily water consumption, availability of latrine, number of rooms, livestock in house, refuse disposal, etc.

Behavioral factors: method of water drawing and storage, feeding practices, action for diarrhea, duration of breast-feeding, time of introducing supplementary feeding, Vaccination status etc.

Data management and analysis

The data was entered using Epi data software and analyzed using SPSS version 20. The data was checked before entering in to the software and cleaning before analysis. We were conducting Bivariable and Multivariale analysis to see the possible associated factors with diarrhea, with 95% CI. Variables with p- value less than or equal to 0.25 during Bivariate analysis were enter into multivariable logistic regression models to control the effect of confounders. We reported the results as adjusted odds ratio (AOR) and 95% confidence intervals.

Ethical Consideration

Ethical approval for the study was secured from the Institutional Review Board of Hawassa University's College of Medicine and Health Sciences. Permission was also granted by the relevant authority at the Halaba Special District Health Office. Before data collection, informed consent was obtained from the mothers or caretakers of the children after a clear explanation of the study's aim. Confidentiality and privacy were strictly maintained throughout the data collection, analysis, and reporting phases. Information gathered from respondents was shared only with the data collectors and principal investigators. Furthermore, any children found to have diarrhea during the data collection process received Oral Rehydration Solution (ORS) and health education related to diarrhea from the data collectors. Their families were also advised to take them to the nearest health institutions for more comprehensive management.

RESULTS

Demographic and socio-economic characteristics of the respondents

A total of 530 mothers or caretakers with children under five participated in the study, resulting in a 100% response rate. The average family size was 7.23 individuals (±2.24 SD).

The respondents' ages were normally distributed, with a mean age of 33.30 years (±6.26 SD). The majority of these respondents, 355 (67.0%), were between 19 and 36 years old. Nearly all, 519 (97.9%), were the biological mothers of the children during data collection. A significant portion, 404 (76.2%), were illiterate, and 488 (92.1%) were married. Furthermore, most respondents, 484 (91.3%), identified as housewives (Table 1).

Environmental characteristics of the households

Of the households surveyed, 438 (82.6%) had a latrine. However, the vast majority of these, 394 (89.9%), were not of an improved type. Most latrines, 362 (82.6%), were private. Worryingly, feces were observed in the pit holes of 88 (21.1%) of the households with latrines. Furthermore, most households, 504 (95.1%), disposed of their waste improperly. While a significant portion, 471 (88.9%), used piped water as their source, only 321 (60.56%) households consumed 20 liters or less of water per

person daily. A very small number, just 34 (6.4%), treated their drinking water at home with bleach or chlorine (Table 1).

Table 1 nvironmental characteristic of the households in Halaba special district, Southern Ethiopia 2021

Variable name	Frequency (n=530)	Percentage (%)
Household floor type		
Mud	524	98.9
Cement	6	1.1
Types of roof material		
Thatched	461	87.0
corrugated iron sheet	69	13.0
Latrine availability		
yes	438	82.6
no	92	17.4
Type of latrine n=438		
Improved	44	10.1
Unimproved	394	89.9
Latrine ownership n=438		
private	362	82.6
shared with neighbor	76	17.4
Feces seen in outside the pit hole n=438		
yes	88	20.1
no	350	79.9
Feces seen around the house compound		
No	129	24.3
yes	401	75.7
Hand wash facility		
Yes	395	75.5
No	135	24.5
Refuse disposal method		
Pit	26	4.9
Open field	504	95.1
Source of water		
Improved	471	88.9
Unimproved	59	11.1
Daily per capita water consumption		
Twenty liters and less	321	60.56
More than 20 liters	209	39.44
Time to water source		
<1 hour	166	31.3
>=1 hour	364	68.7
Home based water treatment		
yes	34	6.4
no	496	93.6

Behavioral characteristics of the respondents

Among the 530 households surveyed, the majority, 494 (93.2%), had introduced supplementary foods to their children. A significant portion of respondents, 411 (83.2%), prepared adult foods (like Enjera with wot or bread, which aren't diverse in terms of food groups) for their children. Additionally, 407 (76.8%) of the respondents fed their children by hand or allowed the children to feed themselves. Notably, only 155 (29.2%) of the respondents reported washing their hands with soap (Table 2).

Table 2 Behavioral characteristics of the respondents in Halaba special district, Southern Ethiopia 2021

Variable name	Frequency (n=530)	Percentage (%)
child start supplementary food		
Yes	494	6.8
No	36	93.2
Types of food the child taken n=494		
cow's milk	83	16.8
adult food	411	83.2
Material used to feed the child n=494		
Hand	407	82.4
cup with spoon	20	4
Cup	23	4.7
Bottle	44	8.9
Hand washing methods		
Soap with water	155	29.2
Ash with water	50	9.4
Water only	325	61.3

Demographic and health characteristics of the indexed children

More than half of the children in the study, 280 (52.8%), were male. Approximately 185 (34.9%) of the children were between 12 and 23 months old, with the overall mean age of the under-five children being 22.75 months (±12.793 SD).

Regarding vaccinations, out of 474 children eligible for the measles vaccine, 430 (90.7%) had received it. Similarly, nearly all of the 530 children eligible for the Rotavirus vaccine, 520 (98.1%), had been vaccinated against Rotavirus. In the two weeks leading up to data collection, 113 (21.3%) of the children had experienced diarrhea (Table 3).

Table 3 demographic and health characteristics of the index children in Halaba special district, Southern Ethiopia 2021

Variable name	Frequency (n=530)	Percentage (%)
Sex of the child		
Male	280	52.8
Female	250	47.2
Age category of the children		
<=5months	38	7.2
6-11 months	38	7.2
12-23 months	185	34.9
24-35months	124	23.4
36-59 months	145	27.4
Mean age of the children		22.75±12.793 months
Current breast feeding status n=530		
exclusive breast feed	38	7.2

Variable name	Frequency (n=530)	Percentage (%)
partial breast feed	286	54.0
not breast feeding	206	38.9
Age at supplementary feeding n=494		
< 6month	61	11.5
At 6 months	433	81.7
Rota vaccination n=530		
yes	520	98.1
No	10	1.9

Factors Associated with under - five diarrheal Disease

The study found a diarrheal disease prevalence of 21.3% in the two weeks preceding the research. A multivariate analysis identified several factors significantly associated with this prevalence. Children were 4.476 times more likely to experience diarrhea based on their drinking water source, while the time taken to reach a water source increased the likelihood by 2.252 times. The presence of feces outside latrine pit holes raised the risk by 2.943 times. Furthermore, feeding children adult food increased their odds of diarrhea by 6.985 times, and bottle feeding emerged as a particularly strong risk factor, increasing the likelihood by 8.269 times (Table 4).

Table 4 Socio-demographic and economic characteristics of the respondents in Halaba special district, Southern Ethiopia 2021

Variable name	Frequency	Percentage (%)
Household family size(n=530)		
2-4 persons	58	10.9
5-8 persons	325	61.3
>8 persons	147	27.7
No of u-5 five children in the household(n=530)		
1 child	403	76
2 children	96	18.1
3or more children	31	5.9
Relationships of respondents (n=530)		
mother	519	97.9
care taker	11	2.1
Age of mothers/care taker category (n=530)		
18-26years	11	2.1
27-36 years	355	67.0
37-45^{+} years	164	30.9
Marital status of respondent (n=530)		
married	488	92.1
divorced	22	4.2
single	12	2.3
widowed	8	1.5
Occupation of the respondents (n=530)		
housewife	484	91.3
merchant	24	4.5
farmer	13	2.5
other	9	1.7
Educational status of father (n=488)		
Illiterate	366	69.1
Read& write	117	22.1
Elementary	5	0.9
monthly income		
<500EBirr	361	68.1
500-1000EBirr	169	31.9
Availability of radio		
yes	201	37.9
no	329	62.1

Table 5 Bivariate and Multi variable analysis of determinants of under - five diarrheal disease in Halaba special district, southern Ethiopia 2021.

Variable	Diarrheal disease (DD)		Odds Ratio (95% CI)	
	Yes (%)	No (%)	Bivariate (COR)	Multivariable (AOR)
Household family size				
2-4 persons	9 (1.7%)	49 (9.3%)	1:00	1:00
5-8 persons	53 (10%)	272 (51.3%)	1.06(0.49, 2.290)	0.47 (0.15,1.47)
>8 persons	51 (9.6%)	96 (18.1%	2.89(1.31, 6.35) **	0.862 (0.21, 3.52)
Number of under-five children				
1 child	69(13%)	334(63%)	1:00	1:00
2 children	10(2%)	21(4%)	2.66(1.62,4.34) ***	1.23 (0.611,2.513)
>=3 children	34(6%)	62(12%)	2.30(1.03,5.11) *	1.45(0.47,4.52)
Educational status of mothers /caretakers n=530				
Illiterate	96 (18.1%)	309 (58.3%)	1	1
read write	15 (2.8%)	100 (18.9%)	0.48(0.26,0.87) *	0.57 (0.24, 1.36)
Elementary	2 (0.4%)	8 (1.5%)	0.80(0.16,3.85)	5.97 (0.95, 37.33)
Availability of radio in the household n 530				
Yes	30(5.7%)	171(32.3%)	0.52(0.32,0 .82) **	0.92 (0.49, 1.73)
No	83(15.7%)	246(46.4%)	1	1

Variable	Diarrheal disease (DD)		Odds Ratio (95% CI)	
	Yes (%)	No (%)	Bivariate (COR)	Multivariable (AOR)
Latrine availability n=530				
Yes	65(12.3%)	373(70.8%)	0.16(0.09,0.26) ***	0.48(0.00, 44.56)
No	48(9%)	44(8.3%)	1	1
Type of latrine n=438				
Improved	7(1.6%)	38(8.6%)	1	1
Not improved	58(13.3%)	335(76.5%)	5.9(2.39,14.62) ***	1.10 (0.32, 3.76)
Handwashing facility n=530				
Yes	75(14%)	320(60.4%)	0.59(0.38,0.94) *	0.84(0.46, 1.54)
no	38(7.2%)	97(18.4%)	1	1
Feces seen on pit hole n=438				
yes	30(6.8%)	59(13.5%)	1.00 (1.00, 1.00) ***	2.94 (1.34, 6.42) *
no	35(8.0%)	314(71.7%)	1	1
Feces around the compound n=530				
Yes	62(11.7%)	67(12.6%)	6.35(4.03,9.99) ***	1.549 (0.57, 4.19)
No	51(9.7%)	350(66%)	1	1
Source of water for drinking n =530				
Improved	73(13.8%)	398(75%)	1	1
Not improved	19(3.6%)	40(7.5%)	11.47(6.29,20.92) ***	4.47 (1.96, 10.21) ***
Time to water source n=530				
< 1hour	17(3.2%)	149(28.1%)	1	1
>=1 hour	96(18.1%)	268(50.6%)	3.14(1.805,5.459) ***	2.25(1.13, 4.45) *
Type of food the child take n=494				
Cow's milk	31(6.3%)	52 (10.5%)	1.399 (1.240, 2.663) *	6.98(1.07,45,43) *
Adult foods	79 (16%)	332 (67.2%)	1	1
Child feed method n=494				
Hands	79 (16%)	328 (66.4%)	1	1
Cup with spoon	2 (0.4%)	18 (3.6%)	0.46 (0.10,2.02)	1.11(0.13, 9.19)
Cup	5 (1%)	18 (3.6%)	0.39 (0.09,1.72)	1.54(0.12, 19.48)
Bottle	17 (3.4%)	27 (5.5%)	6.59(3.42,12.69) ***	8.26(1.08,62.97) ***
Age of child(in month)				
<=5 months	4(0.8%)	34(6.3%)	1	1
6-11 months	22(4.2%)	16(3.0%)	11.68(3.45,39.58) ***	4.08(0.16, 98.52)
12-23 months	40(7.5	145(27.4	2.30(0.78, 6.99)	1.01(0.03, 27.55)
24-35 months	18(3.4	106(20	1.40(0.45, 4.56)	0.62(0.02, 1.19)
36-59 months	29(5.5	116(21.9	2.10(0.69, 6.46)	1.16 (0.74, 1.83)
Current breast feeding status				
Exclusive breast feed	3(0.6%)	35(6.6%)	1	1
Partially breast feed	63(11.9%)	223(42.0%)	3.29(0.981,11.073)	0.34 (0.100, 3.311)
Not breast feed	47(8.9%)	159(30.0%)	3.44(1.015,11.718) *	2.24(0.664, 7.602)
Birth order of the child n=530				
1-3th	19(3.6%)	118(22.3%)	1	1
4-6th	60(11.3%)	236(44.5%)	1.57(0.901,2.768)	1.38(0.580, 3.311)
7-9th	28(5.3%)	60(11.3%)	3.37(1.758,6.488) ***	2.24(0.664, 7.602)
>=10th	3(0.6%)	6(1.1%)	3.10(0.715,13.381)	1.17(0.125, 11.017)

DISCUSSION

This study reveals that 113 (21.3%) of children under five experienced diarrhea within the two-week period preceding the study. Among the environmental factors, the household water source, the time taken to fetch water, and the presence of feces observed on latrine pit holes were significantly associated with diarrhea morbidity in this age group. Furthermore, the types of food children consumed and their feeding methods were identified as behavioral factors significantly linked to diarrheal diseases in children under five, even after accounting for other variables.

In this study the magnitude of under-five diarrhea was almost similar with the studies conducted in Benishngul-Gumuz (22.1%), in Shebedino district Southern, Ethiopia (19.6%), Ghana (19.2%) and Kersa

district, Eastern Ethiopia (22.5%, (17, 18, 29, 30). This study was relatively low compared to a study done in Arba-Minch (31%) (1), Debre Birehan referral hospital(31.7 %) (12) and Enderta woreda Northern, Ethiopia(35.6%) (31) , but this is relatively high compared to a studies conducted in Debre Berhan Town (12.2%) (18) and Wolitta Soddo Town Southern, Ethiopia (11%) (3). This discrepancy in magnitude with the high and low magnitude of the above study could be, due to the population difference, their difference in socio demographic, basic environmental and behavioral characteristics of the respondents.

In this study children from households who were used unimproved water source were increased the risk of diarrheal morbidity compared to children from households who use improved water source. Which is consistent with a cross-sectional studies done in Kenya [32] and a community based unmatched case-control study conducted in Derashe district, Southern Ethiopia [33]. This is can be explained by unimproved water source tends more prone to contaminated by pathogenic microorganisms than improved water source and thus increased under-five diarrhea morbidity. But not consistent with cross-sectional studies done in Wolitta Soddo Town, Southern, Ethiopia[3].

Children from households who spent one or greater than one hour to water source were 2 times more probable to have diarrhea than those children from households who spent less than 1 hour to water source our findings was consistent with other studies reported that spent more time to fetched water was showed strong association with under-five childhood diarrheal morbidity[34]. One way of contamination water is during transportation, it could be due to the fact that, the time to the water source is too long, which results uncover of the container while they rest everywhere.

The odds of having diarrhea in children who lived in households where there were feces seen on the outside pit hole of the hole of latrines were 2.9 times more at risk to have diarrheal morbidity than the odds of children who lived in households where there were no feces seen outside the pit of latrines. our study finding agreed with a cross sectional study conducted in Debre_ Berhan Town [22] and Gummer woreda [35]. It is true that, presence of feces on the pit latrine would be prone children to be contaminated with feces while they defecated as well as other vehicles. This is also an important implication that the mere presence of latrine facility does not have a grant for prevention of excreta-related disease, but it is the proper utilization that had a vital importance.

Children of mothers/care takers who feed cow's milk in addition to breast milk to the children were about 7 times more probable to develop under five diarrheal diseases compared to children of mothers/care takers who feed adult food to the children. It is consistence with study conducted in USA[36].

Feeding children using the bottle was independently risk factors for the occurrence of under- five diarrheal diseases. Our finding was in line with a Community-based cross-sectional study done in Kenya [32] and other community based cross-sectional study conducted in Gummer district, Gurage Zone, Southern Ethiopia [35]. This is due to the possibilities that contamination of the feeding bottle, due to poor handling of the mothers/care takers. It is also the fact that bottles are not simple to clean the left-over foods, as result microorganisms got the chance to multiply inside the bottle finally children become diarrheal disease.

The strength of this study is that- it was community based and that it particularly addressed acute childhood diarrheal morbidity in rural community with 100% response rate. However, there were some limitations in this study. There could be recall or social desirability bias. Also, the study design was cross sectional and it couldn't show the causal effect.

CONCLUSION

In conclusion, diarrhea among children under five was found to be notably high. Key factors associated with acute childhood diarrhea include improper latrine use, the source of drinking water, the time taken to fetch water, and both the types of food and feeding methods used. To mitigate this, the study recommends providing the community with improved water sources. Additionally, communities should be educated on proper latrine use, appropriate food choices, and safe feeding practices to reduce diarrheal risk. Food hygiene and general sanitation are highly recommended.

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ABBREVIATIONS

CHIS: Community health information system, EDHS: Ethiopian Demographic Health Survey, HC: health centers, HH: House Hold, HWTS: Home water treatment system, MDG: Millennium Development Goal, SNNPRS: South Nation Nationality People

Regional State, UNICEF: United, Nation International Children's fund, WHO: World Health Organization

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval for the study was obtained from the Institutional Review Board of Hawassa University's College of Medicine and Health Science. Subsequently, consent was secured from the mothers or caretakers of the children after they received a clear explanation of the study's aim.

CONSENT FOR PUBLICATION

Not applicable.

AVAILABILITY OF DATA

Data will be available upon request from the corresponding author.

COMPETING INTERESTS

The authors have declared that no competing of interests exists.

FUNDING

No funding was obtained for this study.

CONTRIBUTION OF AUTHORS

EM designed the study, participated in the data collection, performed analysis and interpretation of data and drafted the paper and revised the manuscript. AN and BF assisted with the design, took part in drafting the article or revising it critically for important intellectual content; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

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