
Implementation of Community-led Total Sanitation and Hygiene Approach on the Prevention of Diarrheal Disease in Kersa District, Jimma Zone Ethiopia

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Abstract: Introduction: Lack of access to safe water supply and inadequate sanitation and unsafe hygiene practices can cause diarrheal diseases. It is believed that implementation of Community-led Total Sanitation and Hygiene (CLTSH) will significantly reduce the risk of diarrheal diseases. Objective: To assess the Community-led Total Sanitation and Hygiene approach on the prevention of diarrheal disease in Kersa District of Jimma Zone, Southwest Ethiopia. Methods: A cross sectional study was conducted in Kersa District of Jimma Zone, Southwest Ethiopia from December 03, 2012 to January 11, 2013. The study subjects were randomly selected 423 households from CLTSH implemented and 423 households where CLTSH none implemented kebeles. Data was collected through interview and observation then data obtained was analyzed with SPSS version 16.0. Result: The study showed that the extent of latrine coverage and utilization in CLTSH implemented was greater than that of CLTSH non-implemented kebeles. In this study the occurrence of diarrhea was statistically associated with the extent of latrine utilization in the bivariate analysis in the CLTSH non-implemented kebeles [OR: 9.64, 95%CI: (5.11-18.19)] but the significant was disappeared in the multivariate analysis. Study showed that hand-washing facility near the latrine in CLTSH implemented (73.06%) was greater than that of CLTSH non-implemented kebeles (72.58%). But the risk of diarrhea was statistically associated with hand washing facility only in CLTSH non-implemented kebeles in bivariate and multivariate analysis. Conclusion: in the study the diarrhea prevalence is less in CLTSH implemented than the non implemented kebeles. So it is possible to reduce diarrheal disease through implementation of CLTSH approach. Health-workers and local authorities must pay special emphasis to improve these conditions.

Keywords: CLTSH Implementation, Diarrhea Prevention, Cross-sectional Study, Ethiopia

1. Introduction

Inadequate and unsafe water, poor sanitation, and unsafe hygiene practices are the main causes of diarrhea. Diarrheal diseases constitute a major burden of disease in the world, especially in low- and middle-income countries [1]. In 2004, the disease was the third leading cause of death in low-income countries, causing 6.9% of deaths overall [2].

In African countries including Ethiopia, each child on average suffers from five episodes of diarrhea per year while the two-week prevalence ranges from 10 to 40% in different parts of Ethiopia. Diarrheal diseases have persistently been the first or the second causes of visits to health units in the country [3].

Lack of access to clean water, and poor hygiene practices such as open defecation and lack of hand-washing afterwards, are leading causes of diarrhea [4]

Report of Ethiopia Demographic and Health Survey of 2011 also showed that about 46 % of households in the Ethiopia have access to non-improved source of drinking water and 82% of households use non-improved toilet facilities; of these, 38 % of households have no toilet facility [5].

The Government of Ethiopia and partners like UNICEF, Plan International Ethiopia, WSP-AF, and USAID's Hygiene Improvement Project (HIP) are applying tireless efforts to reverse the situation of health risks associated with the current state of hygiene and sanitation in the country. One of the

effective and efficient approaches to upscale sanitation and hygiene is Community-Led Total Sanitation (CLTS); now called community-led total sanitation and hygiene (CLTSH) [6].

Even the implementation was started in different parts of Ethiopia; the assessment of CLTSH approach on the control of diarrheal disease was not assessed, particularly in the study area. So, the objective of this study is to assess the implementation of Community-led Total Sanitation and Hygiene approach on the prevention of diarrheal disease in Kersa District, Jimma zone Ethiopia.

2. Methods and Materials

2.1. Study Design and Population

A community based cross-sectional study design was conducted from December 2012-January 2013 in Kersa District, Jimma zone Ethiopia. Randomly selected households living in six selected kebeles of Kersa District were included in the study. The representative person of the family (household heads or spouses) and live for more than 6 months in the study area was included. The sample size was calculated using two population proportion formula. By using proportion of households exposed to diarrheal disease 50% for two study groups (there is no similar study), 95% confidence level, 5% tolerable margin of error and possible non-response rate of 10%, the final sample size was 846. The study subjects were selected by multi stage sampling procedure, where first the kebeles divided in to CLTSH implemented & none-implemented kebeles then 3 kebeles were selected from each total kebeles by simple random sampling technique using lottery method. Then, to draw a sampling frame the total numbers of households in the selected kebeles were obtained from local authority of that kebele. The study households were distributed proportionally to population size (number of households) in the kebeles. Systematic random sampling (every 8th households) from the selected households in the kebeles was included for the study. Data was collected using a structured questionnaire prepared by reviewing previously done studies and other materials related to the topic. To maintain the quality of data, training was given for data collectors. Regular and continues follow up was made by the principal investigator to monitor quality of the data collection process and every filled checklist was checked on daily basis and feedbacks were given to data collectors.

2.2. Study Variables

Diarrheal disease prevalence was the dependent variable and Socio-economic factor (age, sex, income, occupation, educational status & religion), Environmental factors (water source, water source protection, availability of latrine, latrine lid, hand washing near latrine & way of waste disposal) and Behavioral factors (Water storage, time of hand washing, Way of drinking water drawing from storage, latrine utility, open defecation, hand washing after defecation) were independent variables of the study.

2.3. Data Processing and Data Analysis

The collected data were edited, entered into a computer by using SPSS version 16.00 and analyzed. Binary logistic regression was done to determine whether the independent variables can predict the outcome variable. The result of the odd ratio was used for interpretation of strength of prediction of the independent variable to the outcome. The finding from all analysis was summarized and presented by graphs, tables and other summery measures. For all statistical significance tests, the cut-off value set will be $p < 0.05$ with CI of 95

2.4. Ethical Consideration

Ethical approval was obtained from Jimma University College of Public Health and Medical Science, Department of Environmental Health Sciences & Technology; informed permission was also obtained from Kersa District & each study subject prior to the interview after the purpose of the study was explained to respondent.

3. Result

3.1. Social Demographic Characteristics of Respondents

A total of eight hundred forty six households were included in this study. Out of these households, four hundred twenty three (50%) from CLTSH implemented kebeles while the remains were from CLTSH none implemented kebeles. There was no non-response found during the data collection. One hundred eighty four (43.50%) and one hundred thirty four (31.68%) of the respondents were wives in CLTSH implemented and non-implemented kebeles respectively (Table 1).

3.2. Environmental Characteristics of Diarrhea

One hundred ninety three (45.63%) households in CLTSH implemented kebeles & three hundred seventy three (88.20%) households in CLTSH non-implemented kebeles used spring as the main source of drinking water. Three hundred eight (72.81%) & two hundred twenty nine (54.10%) of households in CLTSH implemented and non-implemented kebeles used protected source as the main source of water respectively. Regardless of the distance of water source, three hundred thirty one (78.25%) households in CLTSH implemented kebeles and three hundred forty eight (82.30%) households in CLTSH none implemented kebeles got water in a less than one kilometer walking distance from their home.

Three hundred eighty seven (91.49%) households in CLTSH implemented kebeles and three hundred seventy two (87.90%) households in CLTSH none implemented kebeles had latrine facility. All (100%) types of available latrines were traditional pit latrines. One hundred four (23.87%) of latrine in CLTSH approach implemented kebeles and two hundred ten (56.42%) of latrine in CLTSH approach none implemented kebeles were do not have cover for latrine drop-hole. About two hundred thirty four (60.47%) of latrines in CLTSH implemented kebeles and one hundred ninety two (51.45%) of

latrines in CLTSH none implemented kebeles were less than six meter far away from kitchen. One hundred four(26.94%) households CLTSH implemented kebeles & one hundred two (27.42%) households in CLTSH none implemented kebeles with latrine had no any kind of hand washing facilities. (Table 2)

Table 1. Socioeconomic characteristics of the study households of the study site, Kersa District, January 2013.

Variable	Community-led Total Sanitation and Hygiene approach		
	Implemented kebeles No (%)	Non-Implemented kebeles No (%)	
Status of the respondent	Husband	143(33.81)	185(43.74)
	Wife	184(43.50)	134(31.68)
	Others	96(22.70)	104(24.59)
Age of respondent	18-25	154 (36.41)	168(39.72)
	25-40	235(55.56)	186(43.97)
	>40	34(8.04)	69(16.31)
Religion	Orthodox	2(0.47)	93(21.99)
	Protestant	0	8(1.89)
	Muslim	421(99.53)	322(76.12)
Ethnicity	Oromo	421(99.53)	415(98.11)
	Amhara	0	4(0.95)
	Kefa	0	4(0.95)
Family size	Others	2(0.47)	0
	1-3	94(22.22)	97(22.93)
	4-6	231(54.61)	177(41.84)
No of children aged under 5	>7	98(23.17)	149(35.22)
	1	171(40.43)	202(47.75)
	2 and above	166(39.24)	86(20.33)
Education status of the respondent	None	86(20.33)	135(31.91)
	Illiterate	261(61.70)	244(57.68)
	Literate	162(38.30)	179(42.32)
Occupation of the Household	Governmental employee	10(2.36)	15(3.55)
	Merchant	38(8.98)	66(15.60)
	Farmer	373(88.18)	340(80.38)
Monthly income	Daily laborer	2(0.47)	2(0.47)
	<350	10(2.36)	193 (45.63)
	350-550	38(8.98)	82(19.39)
	551-750	373(88.18)	21(4.96)
	>750	2(0.47)	127(30.02)

Table 2. Environmental conditions of the study households of the study site, Kersa District, January, 2013.

Variables	Community-led Total Sanitation and Hygiene approach		
	Implemented kebeles No (%)	Non-implemented kebeles No (%)	
Water source	Spring	193(45.63)	373(88.2)
	Well	230(54.37)	50(11.80)
Water source protection	Protected	308(72.81)	229(54.10)
	Unprotected	115(27.19)	194(45.90)
Time taken in minute	<15	277(65.48)	238(56.30)
	15-30	126(29.79)	157(37.10)
living with cattle	30 and above	20(4.73)	28(6.60)
	No	407(96.22)	270(63.83)
Latrine availability	Yes	16(3.78)	153(36.17)
	Available	387(91.49)	372(87.90)
Latrine seat hole cover	Not available	36(8.51)	51(12.10)
	Available	283(73.13)	162(43.55)
Distance of latrine from kitchen in meter	Not available	104(26.87)	210(56.45)
	<6	234(60.47)	192(51.61)
Hand washing facility near latrine	>6	153(39.53)	180(48.39)
	Present	282(73.06)	270(72.58)
Reason for absence of hand washing near latrine	Not present	104(26.94)	102(27.42)
	Don't use	6(5.88)	8(7.84)
	lack of water	26(25.49)	26(25.49)
	Don't know it's important	70(68.63)	68(66.67)

From a total of 846 households whose responses were obtained, thirty (8.24%) in the CLTSH implemented and seventy eight (18.28%) in the CLTSH non-implemented explained that they disposed wastes in open dump in the

compound where as about two hundred sixty one (61.70%) households in the CLTSH implemented and two hundred twenty three (52.5%) households in the CLTSH non-implemented open pits (Figure 1).

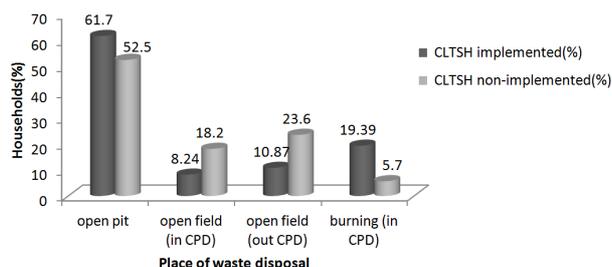


Figure 1. Solid waste disposal methods of households of the study area, Kersa District, January 2013.

3.3. Behavioral Factors of Diarrhea

Two hundred forty three (57.45%) respondents of CLTSH implemented kebeles and two hundred sixteen (51.10%) respondents of CLTSH non-implemented kebeles were treat their drinking water if the source is other than protected source

by boiling, filtering and adding water guard. Three hundred seventy nine (89.60%) of households of CLTSH implemented kebeles and three hundred twenty two (76.10%) of respondents of CLTSH non-implemented kebeles were store their water in jerry can. Forty four (10.40%) of the CLTSH implemented and one hundred one (21.90%) of CLTSH none-implemented kebeles households practiced dipping method to draw water from the container. Three hundred twenty seven (77.30%) in CLTSH implemented kebeles and two hundred ninety four (69.50%) of CLTSH none implemented kebeles households got less than 10L/C/ day average water consumption. The average water consumption of the approach implemented and none implemented kebeles were 8.05 L/C/ day & 7.27 L/C/ day respectively.

Table 3. Behavioral conditions of the study households of the study site, Kersa District, January 2013.

Variables	Community-led Total Sanitation and Hygiene approach	
	Implemented kebeles No (%)	Non-implemented kebeles No (%)
Water treatment	Yes	243(57.45)
	No	216(51.1)
method of treatment	Boiling	180(42.55)
	Filtering	207(48.9)
	Others	32(14.55)
	jerry can	24(9.88)
Material used for water storage	pot	38(15.64)
	Pail	26(11.82)
washing storage equipment before collection	Yes	379(89.60)
	No	322(76.1)
Method of drawing water from storage	Pouring	32(7.57)
	Dipping	79(18.7)
Presence of water storage covers during survey	Yes	12(2.84)
	No	22(5.2)
Average water consumption in L/per/day	<10	407(96.22)
	10– 20	16(3.78)
	by self	2(0.5)
Who construct latrine?	kebele leaders	379(89.60)
	primary health workers	322(76.1)
	Others	44(10.40)
	Rarely	101(23.9)
Latrine utility	Mostly	411(97.16)
	Always	12(2.84)
	too expensive	6(1.4)
If no latrine why not	nearest toilet here	327(77.30)
	No land to build one	294(69.5)
	open field	96(22.70)
If no latrine place of defecation	community latrine	381(98.45)
	Others	4(1.03)
	Others	2(0.52)
Hand washing after defecation	Yes	0
	No	2(0.54)
	only water	0
Detergent used for hand washing	soap/ash	31(8.33)
	Knowledge of importance of hand washing	5(1.29)
Time of hand washing	Mixed practices	382(98.71)
	At all critical time	16(44.44)
Presence of feces in the latrine	Yes	14(38.89)
	No	4(11.11)
Place of children feces disposal	in the latrine	15(41.67)
	in the open field	21(58.33)
	Others	0
Presence of feces in the compound/around home	Yes	385(99.48)
	No	357(95.97)
Knowledge of importance of hand washing	Yes	2(0.52)
	No	15(4.03)
Time of hand washing	Mixed practices	171(40.43)
	At all critical time	216(51.06)
Presence of feces in the latrine	Yes	61(17.04)
	No	421(99.53)
Place of children feces disposal	in the latrine	414(97.9)
	in the open field	2(0.47)
Presence of feces in the compound/around home	Yes	9(2.1)
	No	54(12.8)
Knowledge of importance of hand washing	Yes	413(97.64)
	No	369(87.2)
Time of hand washing	Mixed practices	104(26.87)
	At all critical time	71(19.09)
Presence of feces in the latrine	Yes	283(73.13)
	No	301(80.91)
Place of children feces disposal	in the latrine	347(82.03)
	in the open field	286(67.6)
Presence of feces in the compound/around home	Yes	70(16.55)
	No	123(29.1)
Knowledge of importance of hand washing	Yes	6(1.42)
	No	14(3.3)
Time of hand washing	Mixed practices	120(28.37)
	At all critical time	86(20.3)
Presence of feces in the latrine	Yes	303(71.63)
	No	337(79.7)

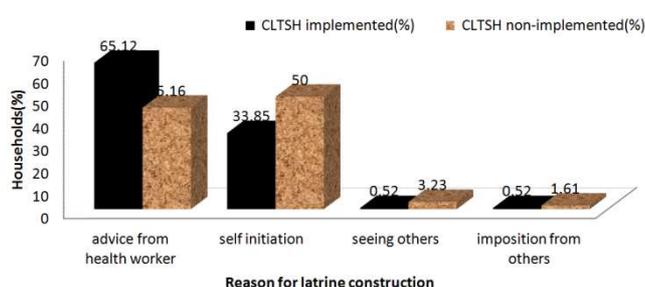


Figure 2. Reasons for latrine construction of the study area, Kersa District, January 2013.

Out of the total 252 households in CLTSH implemented and 268 households in the non-implemented respondents who indicated the availability of latrine; only one hundred thirty one (33.85%) households in CLTSH implemented and

one hundred eight six (50%) households in the non-implemented constructed their latrine by self initiation (Figure 2).

In these households the information on diarrheal morbidity was obtained by asking the households/caretaker whether there was diarrheic person in the two-week period. If the members had had diarrhea, the caretaker was asked about action taken during the diarrheal episode. Accordingly, the overall two weeks period prevalence of diarrhea in the CLTSH implemented and CLTSH none implemented kebeles were found to be 18.91% and 22.22% respectively and the incidence of diarrhea was 11.82% in CLTSH implemented and 13.9% in CLTSH non-implemented kebeles.

Table 4. Health characteristics of the households of the study site, Kersa District, January 2013.

Variables		Community-led Total Sanitation and Hygiene approach	
		Implemented kebeles No (%)	Non-implemented kebeles No (%)
Diarrhoea in the past two weeks period (Incidence)	Yes	50(11.82)	59(13.90)
	No	373(88.18)	364(86.10)
Age of diarrheal patient in the past two weeks	< 5	40(71.43)	44(74.58)
	>5	16(28.57)	15(25.42)
Presence of diarrheal during survey (Point Prev.)	Yes	30(7.09)	35(8.30)
	No	393(92.91)	388(91.70)
Age of diarrheal patient in the during survey	< 5	14(46.67)	25(71.43)
	>5	16(53.33)	10(28.57)
Two weeks period prevalence(Point Prev. + Incidence)	Yes	80(18.91)	94(22.22)
	No	343(81.09)	339(77.78)
Action taken	No action taken	4(6.90)	6(7.69)
	Take to health institution	50(86.21)	72(92.31)
	Take to traditional healer	4(6.90)	0

3.4. Factors Associated with Diarrheal Disease

The association between presences of diarrhea and independent variables was presented in Table 5. In the model, variables which were significantly association in the bivariate analysis were re-evaluated independently controlling for other potential confounders. Hence, most of the variables disappeared and family size, source of water supply, place of waste disposal and detergent used for hand washing after latrine visit in the CLTSH implemented & family size and presence of hand washing facility near the latrine in the CLTSH non-implemented kebeles were remained to be independent risk factors/predictors of diarrheal morbidity.

Even though some variables were significantly association in the bivariate analysis, their significance disappeared in the multivariate analysis. Time of hand washing which was

significantly associated in both CLTSH implemented [OR: 4.25, 95% CI: (1.16-15.53)] and non-implemented [OR: 6.87, 95% CI: (3.73-12.66)] kebeles were disappeared in multivariate analysis. Availability of latrine which showed significant association in the bivariate analysis [OR: 9.64, 95%CI :(5.11-18.19)] also disappeared in the multivariate analysis in CLTSH non-implemented kebeles.

The odds of having diarrhoea in households where waste/refuse was disposed in the Open field (out of the compound) was significantly 3 times higher than the odds in those households that burned in the compound [OR: 3.10, 95% CI: (1.05-9.17)] in CLTSH implemented kebeles and the significance remained appeared in the multivariate analysis in but had no significant association in the multivariate analysis in CLTSH non-implemented kebeles (see table 5).

Table 5. Multivariate regression of the relative effect of variables on the occurrence of diarrhea morbidity, Kersa District, January 2013.

Variables		Community-led Total Sanitation and Hygiene approach			
		Implemented kebeles		Non-implemented kebeles	
		Crude OR(95% CI)	Adjusted OR(95% CI)	Crude OR(95% CI)	Adjusted OR(95% CI)
Family size	1-3	0.95(0.46-1.96)	0.85(0.37-1.97)	2.08(1.10-3.95)*	0.35(0.12-1.09)
	4-6	2.14(1.09-4.19)*	2.13(1.03-4.45)*	1.14(0.62-2.09)	0.27(0.09-0.85)*
	>7	1.0	1.00	1.00	1.00

Variables	Community-led Total Sanitation and Hygiene approach			
	Implemented kebeles		Non-implemented kebeles	
	Crude OR(95% CI)	Adjusted OR(95% CI)	Crude OR(95% CI)	Adjusted OR(95% CI)
Number of under five children	no child		0.73(0.37-1.45)	-
	1		0.42(0.24-0.74)*	-
	2 and above		1.00	1.00
Educational status	Illiterate		1.00	1.00
	Literate		1.77(1.08-2.91)*	0.34(0.11-1.06)
	<350		1.00	1.00
Monthly income	350-550		1.20(0.66-2.18)	2.00(0.63-6.32)
	551 – 750		0.50(0.26-0.97)*	1.97(0.48-8.02)
	>750		-	-
Source of drinking water	Spring	1.00	1.00	
	Well	0.46(0.26 - 0.81)*	0.38(0.17-0.86)*	
Latrine	Available		1.00	1.00
	Not available		9.64(5.11-18.19)*	-
Hand washing near the latrine	Present		1.00	1.00
	Not present		2.11(1.13-3.94)*	2.43(1.25-4.71)*
	In the pit	0.38(0.17-0.87)*	0.38(0.17-0.86)*	1.19(0.52-2.75)
Place of refuse/waste dispose	Open field (in the compound)	0.58(0.26-1.26)	0.85(0.37-1.97)	0.22(0.12-0.38)*
	Open field (out of the compound)	3.12(1.08-9.05)*	2.14(1.03-4.45)*	0.69(0.22-2.18)
	Burning in the compound	1.00	1.00	1.00
				1.00
Time of hand washing	Mixed practices	4.25(1.16-15.53)*	-	6.87(3.73-12.66)*
	At all critical time	1.00	1.00	1.00
Detergent used for hand washing	only water	2.93(1.60-5.38)*	2.46(1.27-4.75)*	
	soap/ash	1.00	1.00	

Note: * =significantly associated p<0.05

4. Discussion

Diarrheal diseases remain a major cause of morbidity and mortality in low-income like Ethiopia societies, and the aim of the present study was to assess the important CLTSH approach implementation on the prevention of diarrheal disease by comparing kebeles where the approach implemented and non-implemented.

In the study, the overall two weeks period prevalence of diarrhea in the CLTSH implemented and non-implemented kebeles were 18.91% and 22.22% respectively. The figure in the CLTSH non-implemented is high when compared with the figure in the CLTSH implemented kebeles. The difference in latrine coverage and utility, water source protection, and the difference in the using soap/ash might explain these variations.

Study showed that family size had impacts on the occurrence of diarrhea in the adjusted in both CLTSH implemented and none implemented kebeles. As the family size becomes increase, they might be overcrowded, which lead the family members to poor hygienic practice.

In this study the occurrence of diarrhea was statistically associated with the family size, source of water supply, place of waste disposal and detergent used for hand washing after latrine visit in the CLTSH implemented kebeles and family size and presence of hand washing facility near the latrine CLTSH none implemented kebeles in the bivariate and multivariate analysis. These variables might be the cause for the difference of diarrhea prevalence for the compared

kebeles.

Study showed that obtaining water from storage containers by dipping was a risk factor for diarrhea [7]. But in this study occurrence of diarrhea was not statistically significant with way of drawing water from storage in both bivariate and multivariate analysis; however the risk of the occurrence of diarrhea was 1.94 and 1.22 times higher in households where water is obtained from storage container by dipping than in those where water is obtained by pouring in the approach implemented and non-implemented kebeles respectively. This might be introducing hands and objects in to stored water were sources of contamination.

The finding of this study shows that 91.49% households of the CLTSH implemented and 87.90% households of the non-implemented kebeles had pit latrines. This result is less when comparing with the findings of RIPPLE in Mirab Abaya Woreda, the SNNPR, which shows the latrine coverage was 94% coverage [8]. But greater when comparing with the findings of the Ethiopia Demographic and Health Survey in 2011, which indicated that about 55% households of the rural areas had latrine facilities[5]. It was also better when comparing with study conducted in district of Bahir Dar Zuria (58.4% [9]. and Kewotth woreda, Amhara Region (67.7%) [10]. The findings of this study also shows that of the households lacked latrines, about 54.9 % in CLTSH non-implemented and 41.67% in CLTSH implemented kebeles were practice open defecation during survey.

Study showed that the occurrence of diarrhoea was associated with the extent of latrine utilization [11]. In this

study the occurrence of diarrhea was statistically associated with the extent of latrine utilization in the bivariate analysis in the CLTSH non-implemented kebeles [OR: 9.64, 95%CI: (5.11-18.19)] but the significant was disappeared in the multivariate analysis. This might be even though the latrines present they defecate in open field.

This study showed that hand-washing facilities near the latrines in CLTSH implemented (73.06%) was almost equal to that of CLTSH non-implemented kebeles (72.58%). The study also indicated that from those households had latrine the habit of hand-washing after defecation in CLTSH implemented and none implemented kebeles were 99.48% and 95.97% respectively. This study was better when comparing with study conducted in East Hararghe, Kersa District, only about 5.1% of the households having latrines were washed their hands after defecation [12]. These large differences might be promotion of hand washing along with latrine construction by governments and NGOs time to time.

The presence of hand washing facilities near the latrines encourages the users to wash their hands after latrine use. However, in multivariate analysis, latrine provided with hand washing facility was related to the risk of diarrhea in CLTSH non-implemented kebeles. But the significance was not related to the risk of diarrhea in both bivariate and multivariate analysis in the approach implemented kebeles. This might be even though the facility was present there they use other water for Handwashing after defecation.

The reveal that 61.70% of the households in CLTSH implemented and 52.50% of the households in CLTSH non-implemented kebeles explained that they disposed wastes in open pit. However, the present finding is relatively higher when compared with study conducted in Kersa woreda, Eastern Hararghe, which shows 26.5% disposed wastes in open pits [12].

The study showed that the average water consumption of CLTSH approach implemented and non-implemented kebeles were 8.05 L/C/ day & 7.27 L/C/ day respectively. However, this study finding was almost similar when compared with study conducted in Mecha District of West Gojjam which showed that the average water consumption was 7.7 L/C/ day [13]. But the result was below the figures of south western Ethiopia which was 15.4 L/C/day [14].

5. Conclusion

In the study the prevalence of diarrhea in the CLTSH non-implemented is high when compared with the figure in the CLTSH implemented kebeles. The study showed that the extent of latrine coverage and utilization in CLTSH implemented was greater than that of CLTSH non-implemented kebeles. The study indicated that both compared kebeles were not ODF even the approach implemented in three kebeles. In this study hand-washing facility near the latrines in CLTSH implemented kebeles (73.06%) was greater than that of CLTSH non-implemented kebeles (72.58%). The study also indicated that from those households with latrine the habit of hand-washing after

defecation in CLTSH implemented was greater than the non-implemented kebeles but had no significant association in bivariate and multivariate analysis in both kebeles. Thus, it can be concluded that it is possible to reduce diarrheal disease through implementation of CLTSH approach.

Recommendations

Depending on the results of this study, the following recommendations are suggested:

Health-workers and local authorities must give health education and sensitization for the community to improve this open defecation.

Certification of the kebele should be based on the sustainability of the approach even in one year.

Authors' Contribution

NE: Conceptualized the research problem, designed the study, prepared the proposal, conducted field work, and analyzed the data, manuscript writing.

AB: Revised the proposal, participated in data analysis and the report revision.

GT: Revised the proposal, participated in data analysis and the report revision.

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