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Latrine Utilization and Its Associated Factors Among Community Led Total Sanitation Implemented and Non-Implemented Kebeles of Tullo District, West Hararge, Eastern Ethiopia

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ABSTRACT

BACKGROUND: Improper human waste management is a major health problem in most developing countries, including Ethiopia. In Ethiopia, the majority of the population used unimproved sanitation facilities and practiced open defecation. This problem is significantly higher in the rural parts of the country.

OBJECTIVE: The aim of this study was to assess latrine utilization and associated factors among Community Led Total Sanitation (CLTS) implemented and non-implemented kebeles in Tullo District, West Hararghe, and Eastern Ethiopia.

METHODS: A community-based comparative cross-sectional study design was conducted in 740 households in 3 kebeles Community Led Total Sanitation implemented and 3 kebeles non-Community Lead Total Sanitation implemented for comparison. Study units were selected using a multi-stage sampling technique. The data was cleaned and coded before being entered into Epi-data version 3.1 and analyzed with the Statistical Package for the Social Sciences version 20. Logistic regression analysis was used to assess the association between dependent and independent variables.

RESULT: In this study, the overall prevalence of latrine utilization in the study area was 415 (56.1%) (95% CI = 52.6%, 59.9%). Of them, 243 (65.7%) (95% CI = 60.4%, 70.3%) and 172 (46.5%) (95% CI = 41.3%, 51.7%) of participants in the CLTS and non CLTS kebeles were utilized latrine, respectively. In CLTS implemented kebeles, literate (AOR = 3.66; 95% CI: 1.53, 8.73), households being visited by health extension worker (AOR = 11.72; 95% CI: 4.01, 34.31), households being graduated as model family(AOR = 7.56, 95% CI: 2.79, 20.44), ⩾2 years by years of latrine owning (AOR = 12.10, 95% CI: 3.21, 45.64), >6 meters distance of toilet to home (AOR = 27.43, 95%CI: 8.43, 89.29),Latrine with hand washing (AOR = 2.93, 95%CI: 1.19, 7.17), latrine with superstructure (AOR = 6.54, 95% CI: 2.04, 20.98) were significantly associated with latrine utilization, while in non CLTS implemented kebeles, literate (AOR = 25.78, 95% CI: 13.35, 49.78), medium wealth status(AOR = 4.87, 95% CI: 2.10, 11.29), poor wealth status(AOR = 2.51, 95% CI: 1.26, 5.01) were significantly associated with latrine utilization.

CONCLUSION: The findings of this study revealed that more of the rural households had utilized latrines in CLTS implemented kebeles than non-CLTS implemented' kebeles. So, it is recommended that the district health office increase the latrine utilization rate through the effective and sustainable implementation of the CLTS approach.

KEYWORDS: Community lead total sanitation, latrine utilization, Tullo District

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Introduction

Sanitation is basic and essential for human health, but lack of sanitation and hygiene is a major public health problem.[1,2] Globally, 2.4 billion people do not use sanitation facilities and around 1.2 billion people practice open defecation, resulting in 828 651 diarrheal deaths annually.[1-3] In developing countries, a challenging problem was the improper disposal of human excreta. According to the 2015, WHO/UNICEF JMP report, in rural areas of developing countries, 43% of the population live without improved sanitation facilities and 23% of the population practice open defecation.[2,4]

Like many developing countries, Ethiopia has low levels of WASH facilities and practice. According to the 2015 WHO/UNICEF JMP report in Ethiopia, around 76 % of its population used unimproved sanitation facilities, and 37% of its population still practices open defecation. From the total population using unimproved sanitation facilities, 63% was rural population.[2] Also, the Ethiopian Demographic Health Survey (EDHS) 2016 indicated that 52.9% of households (55.6% in rural and 42.6% in urban areas) of the population have access to non-improved sanitation facilities. Overall, 35.5% of households (6.9% urban and 32/% rural) live without toilet facilities.[5]

Poor utilization of latrines causes a serious health risk, which increases the risk of excreta-born diseases.[6] In Ethiopia, 60% to 80% of infectious diseases are associated with contaminated

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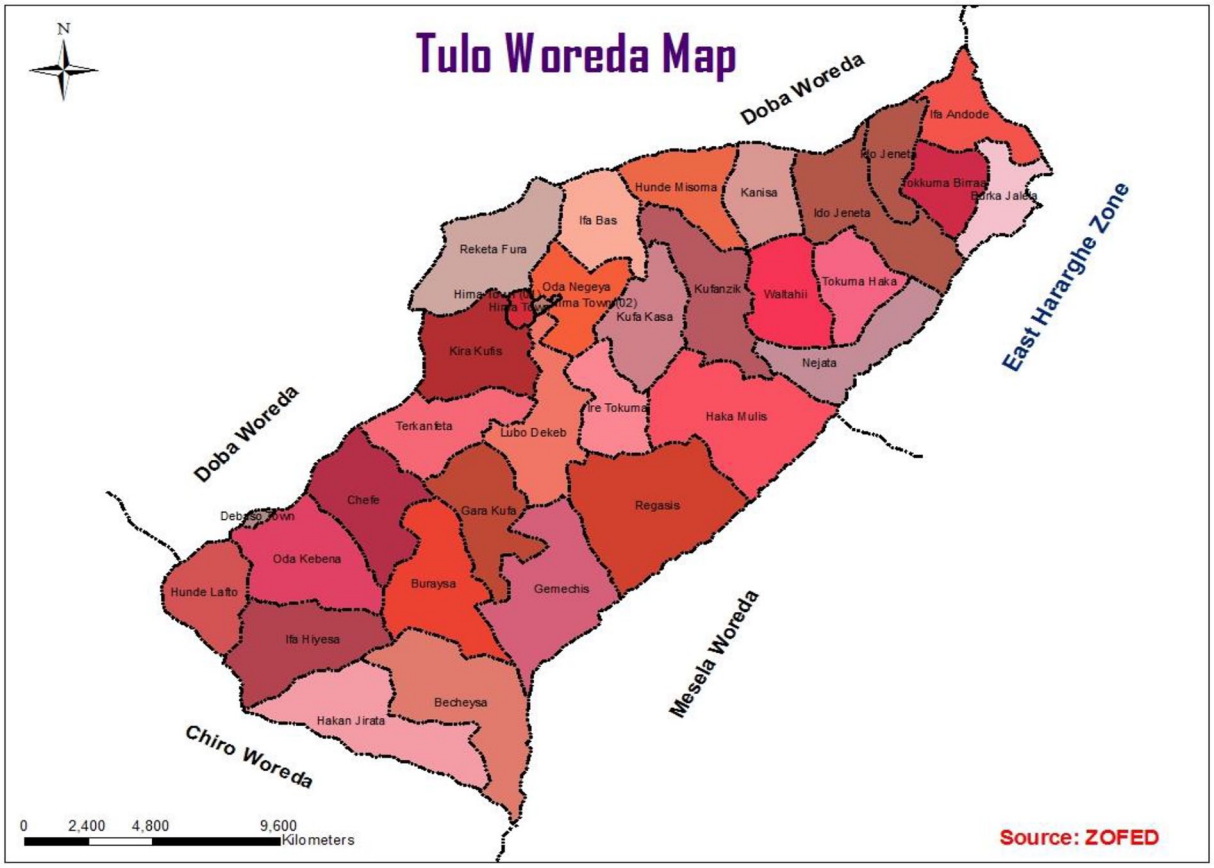


Figure 1. Map of Tulo dustrict,Eastern Ethiopia.

water and unhygienic and unsanitary human waste management.[7] For a few years, Ethiopia has been struggling to increase sanitation coverage and reduce open defecation practices, but is still found among the most open defecating 10 countries in Africa.[8]

Different approaches have been introduced worldwide to address the problem caused by lack of sanitation. This is especially to benefit the poor and marginalized communities. From these approaches, CLTS is the best one for safe sanitation, and for the first time it was tested and practiced in Bangladesh and, after that, implemented in 5000 villages worldwide.[9,10] CLTS is the most widely implemented approach for improving rural sanitation in low-income countries to create an open defecating-free environment and reduce under-five diarrheal diseases.[11] According to the study, community sanitation reduces diarrheal disease by more than 75%.[12] In Ethiopia, CLTS is an approach used to mobilize the entire community toward improving sanitation status to bring about national-wide behavioral change. In Ethiopia, a study indicated that the prevalence of under-five childhood diarrheal disease ranges from 9.9% to 17.2% in ODF villages and from 23.2% to 36.3% in OD villages[13]

The 2011 Ethiopian Hygiene and Sanitation Strategic Action Plan indicated that CLTS had reached all 9 regions of Ethiopia and randomly selected 439 districts, but in some rural parts of Ethiopia till now, this sanitation approach has not been widely implemented.[14] In the study area, there is no rigorous and comprehensive local data on the current status of latrine utilization and contributing factors. Therefore, this study aimed to assess latrine utilization and associated factors among Community Lead Total Sanitation (CLTS) implemented and non-implemented kebeles in Tullo District, West Hararghe, and Eastern Ethiopia.

Methods

Study area and period

The study was conducted in the Tullo district from June 1 to 25, 2020. The district is found in the West Hararghe Zone, Oromia Regional State, Eastern Ethiopia. It is located 370 km from Addis Ababa in the eastern part of Ethiopia. According to data obtained from the district health bureau, the projected population size of the district in 2020 is around 199 968 and 41 663 households. The district has 3 urban and 30 rural kebeles. Among 30 rural kebeles, 15 were CLTS implemented and the other 15 were NCLTS implemented[15] (Figure 1).

Study design and population

A community-based comparative cross-sectional study design was conducted. Randomly selected households from each randomly selected kebele of Tullo district (Kira kufis, Tarkenfata, and Oda from CLTS implemented kebeles) and (Lubudaqab,

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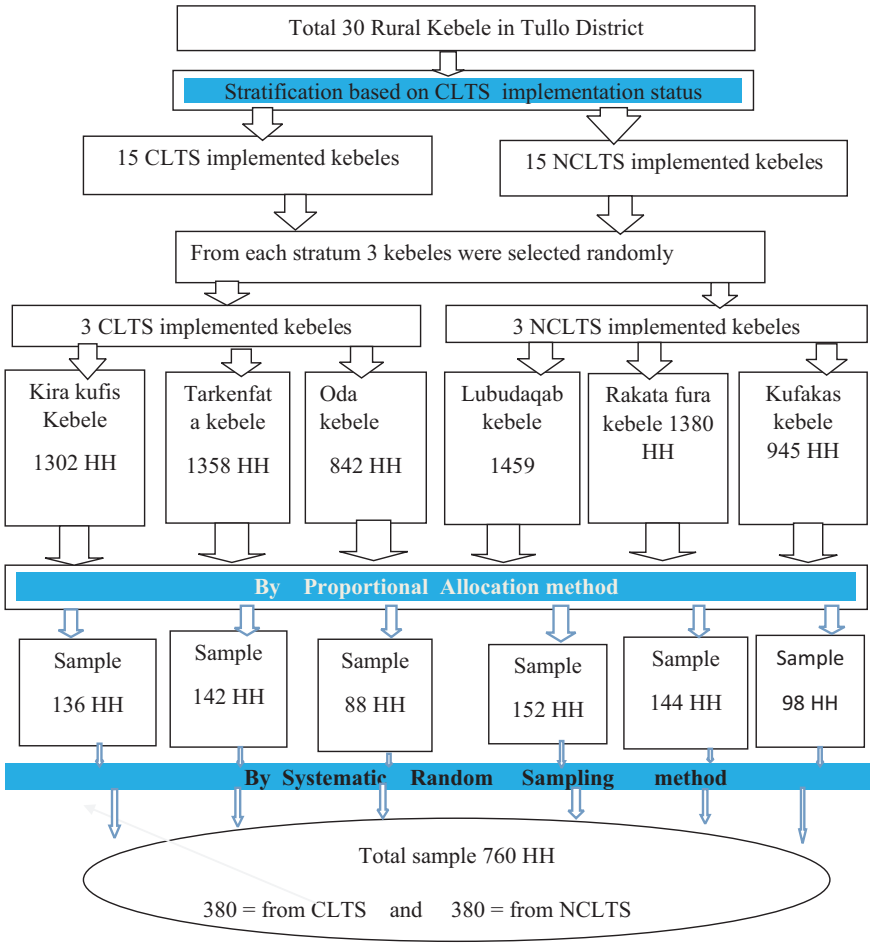


Figure 2. Schematic presentation of sampling procedure.

Rakata fura and Kufakas kebeles from NCLTS implemented kebeles) were included. All selected households' heads or representatives >18 years of age and living in the study area for at least 6 months before data collection were interviewed. But, households that were unable to respond due to mental disorders or other health problems and refused to participate were excluded from the study.

Sample size determination and sampling techniques

The sample size of the study was calculated by applying 2 population proportion formula using Stat Calc program of Epi info version 7 with the following assumptions: the rate of latrine utilization was 55% and 39% in CLTS implemented and NCLTS implemented kebeles, respectively,[3] with 95% CI ($\alpha/2 = 0.05$), 80% power of detection ($\beta = 0.20$), 10% non-response rate and a ratio equivalent to 1. Based on the above assumptions, 361 participants were obtained. Because of the design effect, the calculated sample size was multiplied by 1.5. Therefore, the final sample size for this study was 760 (380 household heads from CLTS and 380 from NCLTS implemented kebeles).

A multi-stage sampling procedure was used to select study participants. First, the district was stratified into CLTS implemented and non-implemented kebeles. Second, 3 kebeles from CLTS implemented and 3 kebeles from non-CLTS implemented were selected randomly. Thirdly, study participants were selected using a systematic random sampling method in proportion to the size of households in the selected kebeles (Figure 2). Finally, the households were identified systematically through a house-to-house visit in the kebeles (since $K\text{th} = 9$ (7286/760). The first sample between 1 and 9 was selected randomly by lottery method, and then every ninth selected participant was included in the study.

Data collection method

Data were collected using sanitation-based structured questionnaires developed after reviewing previous studies[3,16] and EDHS.[5] The questionnaire was first prepared in English and translated to Afan Oromo, then back to English to maintain its consistency. The data were collected through interview using a sanitation-based structured questionnaire and latrine observation. Twelve college graduated professionals who had experience in data collection have participated in data collection. Two Environmental health professionals from Tullo District health office participated in supervising data collection.

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Operational definition

Community-Led Total Sanitation and Hygiene (CLTS): is a community-based approach that focuses on eradicating open defecation by generating behavioral change in sanitation at a community level and by stimulating demand for latrines and hygiene practice.[16]

Latrine utilization: in current study, households with either shared or private functional latrines and the family disposed of the faces of under-five children in a latrine, no observable faces in the compound, no observable fresh faces on the inner side of the squatting hole and the presence of clear foot-path to the latrine is uncovered with grasses or other barriers to walking and showed at least 2 signs of latrine use[17]

Data quality control

A pre-test has been conducted in Chafe kebele from CLTS implemented and Kufanzik kebele from NCLTS implemented to check the sensitivity of questions and misunderstanding of the questions by data collectors before the actual data collection is carried out. Populations in these kebeles' have similar socio-economic characteristics to selected kebeles that are included in the study. Training was given for data collectors and supervisors for 2 days, particularly focusing on the proper filling of the questionnaire, latrine observation, community approach, and purpose of the study. Every day, the collected data was reviewed and checked for completeness and consistency by the supervisors and principal investigator. The code was given manually to check and completed the data. Double data entry was made using Epi-Data version 3.1 to validate the data.

Method of data analysis and processing

The checked and coded data were entered into Epi-Data version 3.1 and exported to SPSS version 20.0 for analysis. The results were presented using frequency distributions and tables. Logistic regression analysis was used to assess the association between dependent and independent variables. The outcome variable was re-coded to dichotomous outcomes, and the independent variables were coded based on preceding related studies and the distribution of responses in the data. The collinearity effect was checked by looking at values of the standard error. Variables with a standard of >2 were dropped from the analysis, and non-collinear covariates were included in the independent final binary logistic regression model to assess predictors of latrine utilization. All covariates that were significant at *P*-value <.25 in the bivariable analysis were considered for further multivariable analysis to control for all possible confounders and to identify predictors of latrine utilization. Odd ratios along with 95% CI were estimated to identify factors associated with the outcome variable using multivariable logistic regression. The level of statistical significance was declared at *P*-values of less than .05.

Ethical consideration

An ethical clearance was obtained from the Haramaya University College of Health and Medical Sciences Institutional Health Research Ethics Review Committee (IHRERC) and a written official letter was submitted to the Tullo district health office. A written letter of permission was gained from the District health bureau to conduct the study on selected kebeles. Information was provided to all study participants about the objective of the study. Each study participant was told that information obtained from them was kept secret and had the full right to refuse or terminate the interview at any time. Finally, informed voluntary consent was obtained from each study participant before the interview. The interview was conducted in a simple and local language.

Results

Socio-demographic characteristics

A total of 740 participants were involved in this study with a 97.4% response rate. Among these, 474(64.1%) were males. One hundred eighty-three (49.5%) of respondents in CLTS implemented kebeles and 190 (51.4%) of respondents in NCLTS implemented kebeles were aged from 30 to 40 years. The mean ages (±SD) of respondents were 36.19 ± 7.54 years in CLTS implemented and 36.11 ± 7.53 years in NCLTS implemented kebeles. Two hundred forty-three (65.7%) in CLTS implemented and 175 (47.3%) in NCLTS implemented kebeles were illiterate. In respect to occupational status, 214 (57.8%) and 218 (26.5%) were farmers from CLTS and NCLTS implemented kebeles, respectively. Relating to the family size, 266 (61.1%) and 229 (61.9%) households had ⩽5 family members in CLTS implemented and NCLTS implemented kebeles, respectively. The mean family sizes (±SD) of respondents were 4.56 ± 1.35 in CLTS implemented kebeles and 4.42 ± 1.23 in NCLTS implemented kebeles. Concerning economic status, relative wealth index 156 (42.2%) in CLTS and 146 (39.5%) in NCLTS implemented kebeles were of poor wealth status, respectively (Table 1).

Latrine utilization

The overall prevalence of latrine utilization in the study area was 415 (56.1%) and of these, 243 (65.7%) and 172 (46.5%) of respondents in the CLTS and NCLTS implemented kebeles were utilized latrines, respectively. Two hundred twenty-six (61.1%) households in CLTS implemented kebeles and 167 (45.1%) households in NCLTS implemented kebeles had a fresh footpath leading to the toilet. Two hundred thirty-four (63.2%) households' latrines in CLTS implemented kebeles and 171 (46.2) in NCLTS implemented kebeles had splashed water or urine on the toilet floor. Faeces were observed inside latrines in 213 (57.6) and 171 (46.2) households' latrines in CLTS and NCLTS implemented kebeles, respectively. Flies were observed inside toilets in 210 (56.8%) households' latrines in CLTS

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Table 1. Socio-demographic characteristic of the study participants, Tullo district, West Hararghe Zone, Eastern Ethiopia, 2020 (n = 740).

CHARACTERISTICS	CATEGORY	CLTS (N = 370)	NON-CLTS (N = 370)	TOTAL (N = 740)
		N (%)	N (%)	N (%)
Age (in years)	<30	94 (25.4)	88 (48)	182 (24.6)
	30-40	183 (49.5)	190 (51.4)	373 (50.4)
	>40	93 (25.1)	92 (74.5)	185 (25)
	Mean ± SD	36.19 ± 7.54	36.11 ± 7.53	36.15 ± 7.53
Sex	Female	138 (37.3)	128 (62.7)	266 (35.9)
	Male	232 (62.7)	242 (65.4)	474 (64.1)
Education	Illiterate	243 (65.7)	157.0 (42.4)	400 (54.1)
	Literate	127 (34.3)	213.0 (16.1)	340 (45.9)
Occupation	Housewife	69 (18.6)	79.0 (23.6)	148 (20.0)
	Farmer	214 (57.8)	218.0 (26.5)	432 (58.4)
	Others	87 (23.5)	73.0 (32.2)	160 (21.6)
Religion	Muslim	91 (24.6)	99.0 (24.8)	190 (25.7)
	Orthodox	239 (64.6)	227.0 (28.5)	466 (63.0)
	Others	80 (21.6)	44.0 (49.1)	124 (16.8)
Marital status	Married	358 (96.8)	337.0 (28.7)	695 (93.9)
	Single/Unmarried	8 (35)	15 (65.2)	23 (3.1)
	Divorce/separated	1 (16.66)	5 (83.33)	6 (0.81)
	Widowed	8 (2.1)	8 (2.1)	16 (2.16)
Family size	>5	144 (38.9)	141 (38.1)	285 (38.5)
	⩽5	226 (61.1)	229 (61.9)	455 (61.5)
	Mean ± SD	4.56 ± 1.35	4.42 ± 1.23	4.49 ± 1.29
Having children	Yes	202 (54.6)	176.0 (31.0)	378 (51.1)
	No	168 (45.4)	144.0 (31.5)	312 (42.2)
Wealth index	Poor	156 (42.2)	146 (39.5)	302 (40.8)
	Medium	96 (25.9)	89 (24.0)	185 (25.0)
	Rich	118 (31.9)	135 (36.5)	253 (34.2)

implemented and 171(46.2) households' latrines in NCLTS implemented kebeles. Human faeces were also observed in 239 (64.6) and 172 (46.5%) households compounds' in CLTS and NCLTS implemented kebeles, respectively (Table 2).

Health extension worker related factors

Two hundred seventy-nine (37.7%) of households were visited by health extension workers (HEWs) in the study area. Among these, 115 (31.0%) households in CLTS implemented and 164 (44.3%) households in NCLTS implemented kebeles were visited by HEWs. From the total households visited by HEWs, 77(20.8%) and 141(38.1%) households were visited once a week in CLTS and NCLTS implemented kebeles respectively. Only 98 (26.5) households in CLTS implemented kebeles and 86 (23.2%) households in NCLTS implemented kebeles were graduated as model families. 306 (82.7%) in CLTS implemented kebeles and 257 (69.5) and in NCLTS implemented kebeles were constructed latrine by the initiation of Health workers (Table 3).

Latrine related factors

Out of 740 study participants, 314 (84%) in CLTS implemented kebeles, and 206 (56%) in NCLTS implemented

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Table 2. Latrine utilization based on observational checklist in selected kebeles in both CLTS and non CLTS kebeles of Tullo district, East Ethiopia, 2020 (n = 740).

CHARACTERISTICS	CATEGORY	CLTS (N = 370): N (%)	NON-CLTS (N = 370): N (%)	TOTAL (N = 740): N (%)
Latrine utilization	Yes	243 (65.7)	172 (46.5)	415 (56.1)
	No	127 (34.3)	198 (53.5)	325 (46.9)
Is there fresh foot paths leading to toilet	Yes	226 (61.1)	167 (45.1)	393 (53.1)
	No	144 (38.9)	203 (54.9)	347 (46.9)
Is there splashed water or urine on toilet floor	Yes	234 (63.2)	171 (46.2)	405 (54.7)
	No	136 (36.8)	199 (53.8)	335 (45.3)
Are faeces observed inside the latrine	Yes	213 (57.6)	171 (46.2)	384 (51.9)
	No	157 (42.4)	199 (53.8)	356 (48.1)
Are fly observed inside the toilet	Yes	210 (56.8)	171 (46.2)	381 (51.5)
	No	160 (43.3)	199 (53.8)	359 (48.5)
Are human faeces observed in the compound	Yes	239 (64.6)	172 (46.5)	411 (55.5)
	No	131 (35.4)	198 (53.5)	329 (44.5)

Table 3. Health extension package related characteristics of participants in Tullo district, Eastern Ethiopia, 2020 (n = 740).

CHARACTERISTICS	CATEGORY	CLTS (N = 370): N (%)	NON-CLTS (N = 370): N (%)	TOTAL (N = 370): N (%)
Does HEW visited your HH	Yes	115 (31.0)	164 (44.3)	279 (37.7)
	No	255 (69)	206 (55.7)	461 (62.3)
If yes, what is frequency of visit (week)?	Once	77 (20.8)	141 (38.1)	218 (29.4)
	Twice and above	38 (10.2)	23 (6.2)	61 (8.3)
Graduated as model family	Yes	98 (26.5)	86 (23.2)	184 (24.8)
	No	272 (73.5)	284 (76.8)	556 (75.1)
Initiator of toilet construction for your household	Self-initiated	27 (7.3)	50 (13.5)	77 (10.4)
	Kebele leaders	37 (10)	63 (17.0)	100 (13.5)
	Health workers	306 (82.7)	257 (69.5)	563 (76.1)

kebeles had latrines with the superstructure. Two hundred twenty-five (60.8%) households in CLTS implemented kebeles and 180 (48%) households in NCLTS implemented kebeles had a private latrine. In CLTS and NCLTS implemented kebeles, only 144 (38.9%) and 140 (37.8%) households had latrines with hand washing facilities, respectively. Two hundred ninety-nine (80.9%) of latrines in CLTS implemented kebeles and 289 (78.1%) of latrines in NCLTS implemented kebeles were greater than or equal to 6 m away from home (Table 4).

Factors associated with latrine utilization

Age, educational status, occupational status, family size, presence of under-five child in the family, wealth index, being visited by HEWs, being graduated as a model household, type of latrine, initiators for latrine construction, years of latrine ownership, distance of the toilet from the main house, latrine with superstructure, and latrine with hand washing facility were found to be significant at *P*-value .25 and a candidate for multivariate analysis in bivariate analysis in CLTS implemented kebeles. In non-CLTS implemented kebeles, age, educational status, occupation, wealth index, being visited by HEWs, being graduated as a model family, type of latrine, initiators for latrine construction, distance of latrine from the main house, latrine with superstructure facilities, and latrine with hand washing were significant at P-value ⩽.25 and found to be a candidates for multivariable logistic regression (Table 5).

In Multivariable logistic analysis, educational status, household being visited by HEWs, being graduated as a model family, type of toilet, years of latrine ownership, the distance of the latrine to home, latrine with the superstructure and latrine with hand washing were significantly associated with latrine

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Table 4. Environmental and latrine related factors in Tullo district Eastern Ethiopia, 2020 (n = 740).

CHARACTERISTICS	CATEGORY	CLTS (N = 370): N (%)	NON-CLTS (N = 370): N (%)	TOTAL (N = 740): N (%)
Latrine with superstructure	Yes	314 (84)	206 (56)	520 (70.2)
	No	56 (16)	109 (44)	447 (22.8)
Types of latrine	Shared	145 (39.2)	190 (48.6)	335 (45.3)
	Private	225 (60.8)	180 (48.4)	405 (54.7)
Latrine with hand washing facility	Yes	144 (38.9)	140 (37.8)	284 (38.8)
	No	226 (61.1)	230 (62.2)	456 (61.2)
Distance of latrine from main home	⩽6 m	71 (19.1)	81 (21.9)	152 (20.6)
	>6 m	299 (80.9)	289 (78.1)	588 (79.4)

utilization in CLTS. Whereas in non-CLTS implemented kebeles; educational status, wealth index, and type of toilet were significantly associated with latrine utilization at $P < .05$ (Table 5).

Literate households in CLTS implemented kebeles were 3.66 times (AOR = 3.66; 95%CI [1.53, 8.73]) more likely to use their latrine than illiterate households. In addition, the odds of utilizing a latrine in the household being literate were 25.78 times (AOR = 25.78; 95%CI [13.35, 49.78]) higher in non-CLTS implemented kebeles.

In non-CLTS, poor and medium wealth households were 2.5 times (AOR = 2.51; 95%CI [1.26, 5.01]) and 4.87 times (AOR = 4.87; 95%CI [2.10, 11.29]) more likely to use their latrine than rich households. Households that were visited by health extension workers in CLTS implemented kebeles were 11.72 times (AOR = 11.72; 95%CI [4.01, 34.31]) more likely to utilize their latrine than those that were not visited. Households being graduated as model families were 7.56 times (AOR = 7.56; 95%CI [2.79, 20.44]) more likely to utilize their latrine in CLTS implemented kebeles compared to their counterparts. In CLTS kebeles households owned that private latrine were utilized 9.18 times (AOR = 9.18; 95%CI [4.06, 20.74]) more than those who had shared latrine. Furthermore, the odds of utilizing latrine in households with private latrine were 4.66 times (AOR = 4.66; 95%CI [2.56, 8.50]) higher than those who have shared in non-CLTS implemented kebeles. Households owning latrines for >2 years were utilized 12.10 times (AOR = 12.10; 95%CI [3.21, 45.64]) more likely compared to households owning latrines for less or equal to 2 years in CLTS implemented kebeles.

The odds of utilizing latrine in households with greater than 6-m latrine distance from home were 27.43 times (AOR = 27.43; 95%CI [8.43, 89.29]) higher than those who had less than or equal to 6-m distance in CLTSH implemented kebeles. Households that had latrines with the superstructure were utilizing their latrines 6.54 times (AOR = 6.54; 95%CI [2.04, 20.98]) higher than the compared counterparts in CLTSH implemented kebeles. Households that had hand washing facilities in CLTSH implemented kebeles had 2.93 (AOR = 2.93; 95%CI [1.19, 7.17]) more likely to utilize their latrine than those that had no hand washing facility (Table 6).

Discussion

In this study, total latrine utilization was 56.1%. This study was consistent with a study conducted in North Ethiopia (54.9%),[3] but it was lower when compared to studies conducted in Kutaber District of the South Wollo Zone in northeastern Ethiopia (71.8%)[18] and Chencha District, GamoGofa, Ethiopia (67%).[19] This difference might be due to the difference in the implementation of the health extension package and the implementation time of CLTS approach in the study population.

In this study, the extent of latrine utilization in CLTS implemented kebeles was 65.7% and 46.5% in NCLTS implemented kebeles. This is lower compared to a study conducted in Hawassa town, Ethiopia, where 90.3% of CLTS implementers and 85.4% of NCLTS implementers utilize their latrine facilities.[3] The reason for the low utilization of latrines in the study area was a difference in the implementation of the CLTS approach and health extension package in the population. In Ethiopia, health extension workers with other health professionals were implementers of a health extension package. In the study area, health extension workers enforce the community on the construction of latrines rather than teach them about proper utilization of latrine facilities. Due to this, the community simply constructs latrines for defense purposes when HEWs and other health professionals come with other concerned bodies for follow up and visit. Due to low follow-up and supervision by health extension workers, the community does not use the latrines they build after a certain period of time.

In this study, 61.1% of households in CLTS implemented kebeles and 45.1%of households in NCLTS implemented kebeles had a fresh footpath leading to the toilet. This study is a similar study conducted in the Machakel district in Ethiopia.[20]

The fresh foot path is being an indicator that the latrine facility is utilized by household members. In rural areas, the community constructs houses in their farming area, which is

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Table 5. Bivariate logistic regression of factors associated with latrine utilization among households in CLTS and non CLTS kebeles in Tullo district of West Hararghe Zone, Eastern Ethiopia,2020 (n = 740).

VARIABLE		CLTS KEBELE (N = 370)				NON- CLTS KEBELE (N = 370)			
		LATRINE UTILIZATION		COR (95% CI)	*P*-VALUE	LATRINE UTILIZATION		COR (95% CI)	*P*-VALUE
		YES (%)	NO (%)			YES (%)	NO (%)		
Age (in years)	<30	84 (89.4)	10 (10.6)	13.30 (6.11, 28.93)***	.000	59 (67.0)	29 (33.0)	6.10 (3.19, 11.67)***	.000
	30-40	123 (67.2)	60 (32.8)	3.25 (1.93, 5.45)***	.000	90 (47.4)	100 (52.6)	2.70 (1.56, 4.69)***	.000
	>40	36 (38.7)	56 (31.9)	1		23 (25.0)	69 (75.0)	1	
Sex	Male	158 (68.1)	74 (38.4)	1.33 (0.86, 2.07)	.202	118 (48.8)	124 (51.2)	1.30 (0.85, 2.01)	.228
	Female	85 (61.6)	53 (20.6)	1		54 (42.2)	74 (57.8)	1	
Educational status	Literate	193 (79.4)	50 (20.6)	5.94 (3.71, 9.54)***	.000	115 (73.2)	42 (26.8)	7.49 (4.70, 11.94)***	.000
	Illiterate	50 (39.4)	77 (60.6)	1		57 (26.8)	156 (73.2)	1	
Occupation	Housewife	38 (55.1)	31 (44.9)	0.34 (0.17, 0.69)**	.003	23 (29.1)	56 (70.4)	0.16 (0.08, 0.31)***	.000
	Farmer	137 (64.0)	77 (36.0)	0.50 (0.28, 0.89)*	.018	96 (44.0)	122 (56.0)	0.30 (0.17, 0.53)***	.000
	Others*a	68 (78.5)	19 (21.8)	1		53 (72.6)	20 (27.4)	1	
Family size	≤5	171 (75.7)	55 (24.3)	3.12 (1.99, 4.86)***	.000	112 (48.9)	117 (51.1)	1.29 (0.85,1.97)	.234
	>5	72 (50.0)	72 (50.0)	1		60 (42.6)	81 (57.4)	1	
Under-five child in the family	Yes	153 (75.7)	49 (24.3)	2.71 (1.74, 4.21)***	.000	89 (50.6)	87 (49.4)	1.37 (0.91, 2.06)	.134
	No	90 (53.6)	78 (46.4)	1		83 (42.8)	111 (57.2)	1	
Wealth index	Poor	108 (69.2)	48 (30.8)	1.83 (1.12, 3.02)*	.017	70 (47.9)	76 (52.1)	1.73 (1.07, 2.79)*	.026
	Medium	70 (72.9)	26 (27.1)	2.20 (1.23, 3.91)**	.008	55 (61.8)	34 (38.2)	3.03 (1.74, 5.28)***	.000
	Rich	65 (55.1)	53 (44.9)	1		47 (34.8)	88 (65.2)	1	
HH being visited by HEWs	Yes	104 (90.4)	11 (9.6)	7.89 (4.04,15.40)***	.000	94 (57.3)	70 (42.7)	2.20 (1.45, 3.35)***	.000
	No	139 (54.5)	116 (45.5)	1		78 (37.9)	128 (62.1)	1	
Being graduated as model family	Yes	93 (83.8)	18 (16.2)	3.75 (2.14, 6.58)***	.000	39 (72.2)	15 (27.8)	3.58 (1.90, 6.76)***	.000
	No	150 (57.9)	109 (42.1)	1		133 (42.1)	183 (57.9)	1	
Type of toilet	Private	197 (87.6)	28 (12.7)	15.14 (8.93,25.68)***	.000	129 (71.9)	51 (28.1)	8.65 (5.41,13.83)***	.000
	Shared	46 (31.7)	99 (68.3)	1		43 (22.6)	147 (77.4)	1	
Who (mainly) initiated you to construct latrine	My self	26 (70.3)	11 (29.7)	1.14 (0.54, 2.39)	.740	36 (72.5)	14 (27.5)	2.85 (1.47, 5.53)**	.002
	Kebele	17 (45.9)	20 (54.1)	0.41 (0.20, 0.81)*	.011	14 (22.2)	49 (77.8)	0.32 (0.17, 0.60)***	.000
	HEW/HCW	200 (67.6)	96 (32.4)	1		122 (47.5)	135 (52.5)	1	
Years of latrine ownership	≥2 years	233 (73.7)	83 (26.3)	12.35 (5.95, 25.65)***	.000	163 (47.9)	177 (52.1)	2.15 (0.96, 4.83)	.059
	<2 years	10 (18.5)	44 (81.5)	1		9 (30.9)	21 (69.1)	1	
Distance of toilet to house	>6 m	232 (77.6)	10 (10.6)	18.89 (9.40,37.96)***	.000	155 (53.6)	134 (46.4)	4.36 (2.43, 7.80)***	.000
	≤6 m	11 (15.5)	60 (32.8)	1		17 (21.0)	64 (79.0)	1	
Latrine with superstructure	Yes	230 (73.2)	56 (31.9)	9.06 (4.64, 17.68)***	.000	148 (56.7)	113 (43.3)	4.64 (2.77, 7.76)***	.000
	No	13 (23.2)	43 (76.8)	1		24 (22.0)	85 (78.0.)	1	1
Latrine with hand washing	Yes	116 (80.6)	28 (19.4)	3.23 (1.98, 5.27)***	.000	69 (49.3)	71 (50.7)	1.20 (0.79, 1.83)***	.000
	No	127 (56.2)	99 (43.8)	1		103 (44.8)	127 (55.2)	1	1

Significant at P < .001 = ***; at P < .01=**; P < .05=*; COR, crude odds ratio; *a = Employee/merchants/daily laborers; CLTS, community led total sanitation; HH, Households; HEW, health extension workers.

surrounded by trees, vegetables, grass, crops, and bushes. When households construct a new latrine with in crop, vegetables, and trees, fresh foot path that leads to the toilet would not be formed immediately after the toilet gives service. If the household member repeatedly uses the latrine facility, a fresh foot path leading to the toilet is formed gradually, which is an indicator of latrine utilization.

This study revealed that households that had hand washing facilities were 2.93 times more likely to use their latrine in CLTS implemented kebeles. But a study conducted in the

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Table 6. Mmultivariable logistic regression of factors associated with latrine utilization among households in CLTS and non CLTS kebeles in Tullo district of West Hararghe Zone, Eastern Ethiopia, 2020 (n = 740).

VARIABLE		CLTS KEBELE (N = 370)				NON- CLTS KEBELE (N = 370)			
		LATRINE UTILIZATION		AOR (95% CI)	*P*-VALUE	LATRINE UTILIZATION		AOR (95% CI)	*P*-VALUE
		YES (%)	NO (%)			YES (%)	NO (%)		
Age (in years)	<30	84 (89.4)	10 (10.6)	2.49 (0.68, 9.16)	.012	59 (67.0)	29 (33.0)	1.04 (0.343, 3.24)	.002
	30-40	123 (67.2)	60 (32.8)	0.98 (0.37, 2.62)	.093	90 (47.4)	100 (52.6)	1.23 (0.51, 2.98)	.022
	>40	36 (38.7)	56 (31.9)	1		23 (25.0)	69 (75.0)	1	
Sex	Male	158 (68.1)	74(38.4)	1.21 (0.47, 3.12)	.342	118 (48.8)	124 (51.2)	0.67(0.29, 1.52)	.406
	Female	85 (61.6)	53 (20.6)	1		54 (42.2)	74 (57.8)	1	
Educational status	Literate	193 (79.4)	50 (20.6)	3.66 (1.53, 8.73)**	.034	115 (73.2)	42 (26.8)	25.78 (13.35, 49.78)***	.000
	Illiterate	50 (39.4)	77 (60.6)	1		57 (26.8)	156 (73.2)	1	
Occupation	Housewife	38 (55.1)	31 (44.9)	0.33 (0.08, 1.48)	.329	23 (29.1)	56 (70.4)	0.45 (0.16, 1.25)	.860
	Farmer	137 (64.0)	77 (36.0)	0.55 (0.16, 1.95)	.071	96 (44.0)	122 (56.0)	0.43 (0.19, 1.00)	.008
	Others*[a]	68 (78.5)	19(21.8)	1		53 (72.6)	20 (27.4)	1	
Family size	≤5	171 (75.7)	55 (24.3)	2.04 (0.88, 4.70)	.757	112(48.9)	117 (51.1)	0.83 (0.42, 1.63)	.674
	>5	72 (50.0)	72 (50.0)	1		60 (42.6)	81 (57.4)	1	
Under-five child in the family	Yes	153 (75.7)	49 (24.3)	1.11 (0.44, 2.80)	.500	89 (50.6)	87 (49.4)	0.70 (0.37, 1.33)	.168
	No	90 (53.6)	78 (46.4)	1		83 (42.8)	111 (57.2)	1	
Wealth index	Poor	108 (69.2)	48(30.8)	1.09 (0.42, 2.85)	.165	70 (47.9)	76 (52.1)	2.51 (1.26, 5.01)**	.002
	Medium	70 (72.9)	26(27.1)	2.64 (0.89, 7.80)	.065	55 (61.8)	34 (38.2)	4.87 (2.10, 11.29)***	.000
	Rich	65 (55.1)	53(44.9)	1		47 (34.8)	88 (65.2)	1	
HH being visited by HEWs	Yes	104 (90.4)	11 (9.6)	11.72 (4.01, 34.31)***	0.000	94 (57.3)	70 (42.7)	1.42 (0.73, 2.77)	.402
	No	139 (54.5)	116 (45.5)	1		78 (37.9)	128 (62.1)	1	
Being graduated as model family	Yes	93 (83.8)	18 (16.2)	7.56 (2.79, 20.44)***	.000	39 (72.2)	15 (27.8)	1.28 (0.52, 3.13)	.060
	No	150 (57.9)	109 (42.1)	1		133 (42.1)	183 (57.9)	1	
Type of toilet	Private	197 (87.6)	28 (12.7)	9.18 (4.06, 20.74)***	.000	129 (71.9)	51 (28.1)	4.66 (2.56, 8.50)***	0.000
	Shared	46 (31.7)	99 (68.3)	1		43 (22.6)	147 (77.4)	1	
Who (mainly) initiated you to construct latrine	My self	26 (70.3)	11 (29.7)	1.44 (0.32, 6.45)	0.782	36 (72.5)	14 (27.5)	1.29 (0.44, 3.74)	.214
	Kebele	17 (45.9)	20 (54.1)	0.35 (0.10, 1.22)	.002	14 (22.2)	49 (77.8)	0.67 (0.28, 1.57)	.136
	HEW/HCW	200 (67.6)	96 (32.4)	1		122 (47.5)	135 (52.5)	1	
Years of latrine ownership	≥2 years	233 (73.7)	83 (26.3)	12.10 (3.21, 45.64)***	.000	163 (47.9)	177 (52.1)	1.53 (0.46, 5.10)	.523
	<2 years	10 (18.5)	44 (81.5)	1		9 (30.9)	21 (69.1)	1	
Distance of toilet to house	>6 meters	232 (77.6)	67 (22.4)	27.43 (8.43, 89.29)***	.000	155 (53.6)	134 (46.4)	1.60 (0.70, 3.66)	.040
	≤6 meters	11 (15.5)	60 (84.5)	1		17 (21.0)	64 (79.0)	1	
Latrine with superstructure	Yes	230 (73.2)	84 (26.8)	6.54 (2.04, 20.98)**	.034	148 (56.7)	113 (43.3)	1.72 (0.85, 3.48)	.393
	No	13 (23.2)	43 (76.8)	1		24 (22.0)	85 (78.0.)	1	
Latrine with hand washing	Yes	116(80.6)	28 (19.4)	2.93 (1.19, 7.17)*	.008	69 (49.3)	71 (50.7)	0.96 (0.48, 1.79)	.666
	No	127 (56.2)	99 (43.8)	1		103 (44.8)	127 (55.2)	1	

Significant at P < .001 = ***; at P < .01 = **; P < .05 = *; AOR, Adjusted odds ratio; *a, Employee/merchants/daily laborers; CLTS, community led total Sanitation; HH, households, HEW, health extension workers.

Laelay Maichew District, North Ethiopia[3] showed that households who had latrines with hand washing facilities in CLTS implemented kebeles have no significant association with latrine utilization. This might be due to differences in the level of awareness created among communities to construct hand washing facilities attached to the latrine.

In this study, households being visited by health extension workers were 11.72 times more likely to use latrines in CLTS

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implemented kebeles. This study is similar to research done in Ethiopia on health extension program factors, frequency of household visits, and being model households, improved utilization of basic health services.[21]

In this study, being graduated as the model household/family showed a significant association with latrine utilization in CLTS implemented kebeles. This study was a similar study conducted in the Laelay Maichew District, Ethiopia.[3] This difference between model and non-model families might be due to the strong supportive supervision of health extension workers, the district health office, volunteer community, and knowledge of the community related to the health extension package.

In the current study, households with privately owned latrines were 9 times more likely to use latrines in CLTS implemented kebeles. This is supported by a study conducted in Hetosa, Arsi.[17] This gap might be due to the level of knowledge required to utilize latrine.

This study reveals that households' latrines with superstructures were associated with latrine utilization in CLTS kebeles. This is supported by a study conducted in the Becho district of Oromia, Ethiopia.[22] This could be due to superstructure latrines' being used as a shelter, securing privacy and encouraging utilization.

The odds of utilizing latrines in households with greater than 6 m of distance from the home were 27.4 times higher than those who had less than 6 meters in a study area in which CLTS implemented kebele. But, this is different from the previous study conducted in the Laelay Maichew district of North Ethiopia.[3] The observed inconsistency in latrine utilization might be due to the lack of sufficient space to construct a latrine. The other possible reason was that the community constructed a latrine without consulting health professionals.

Limitation of the study

In rural areas, especially in the dry season, there is no enough space for defecation and urination around the house. Most people prefer to use latrines for privacy purposes, but it may not be comfortable for them due to differences in attitude and cultural influence. In the rainy season, the surrounding environment around the houses is covered with crops, vegetables, and trees, which creates a suitable environment for defecation and urination. Also, it is difficult to know the hygienic status of latrines in different seasons. Most latrines constructed in rural areas were using locally available materials which do not protect latrines from rain and floods. Therefore, this study cannot tell us the latrine utilization status and the hygienic condition of toilet facilities in different seasons.

Conclusion

The utilization of latrines was relatively high among CLTS implementers compared to non-implementers. The study also identified, in CLTS implemented kebeles, educational status, household being visited by HEWs, being graduated as a model family, type of latrine, years of latrine ownership, distance of latrine to home, latrine with the superstructure, and latrine with hand washing facility were positively associated with latrine utilization, and educational status, wealth index, and type of toilet were significantly associated with latrine utilization in non-CLTS implemented kebeles. Therefore, it is recommended that the district health office, cooperating with the zonal health bureau, should expand the CLTS approach to other kebeles of the district. Health extension workers and the district health office, in collaboration with NGOs, should provide technical assistance to households that do not have latrines in order to create an open defecation-free environment.

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Author Contribution

All authors participated in writing the proposal, collecting the data, analyzing the data, and writing the manuscript. All authors read and approved the final manuscript.

Data Availability

The manuscript contains all of the data.

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