Latrine Utilization and Associated Factors Among Community-Led Total Sanitation and Hygiene (CLTSH) Implemented Kebeles in Gurage Zone, Southern Ethiopia: A Cross-Sectional Study

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ABSTRACT

BACKGROUND: In developing countries, open defecation is still a major health issue. While there has been a great deal of empirical research on latrine coverage, but little is known about household latrine utilization behavior. The objective of this study was to assess latrine utilization and associated factors among Community-Led Total Sanitation and Hygiene (CLTSH) implemented kebeles in Gurage Zone, Southern Ethiopia.

METHODS: A community-based cross-sectional study was conducted on 585 randomly selected households in Gurage Zone’s rural Community-Led Total Sanitation and Hygiene (CLTSH) implemented kebeles. The data were entered into Epi-data version 3.1 and analyzed in SPSS version 20. A binary logistic regression analysis was used to identify factors associated with latrine utilization, and a P-value < .05 was used to declare significance.

RESULTS: In this study, 65.8% of households used latrines [95% CI: 61.8%-69.8%]. The odds of using a latrine were higher in households with less than 5 family members [AOR = 2.53, 95% CI: 1.33-4.84], in households with no vegetation around their latrines [AOR = 4.56, 95% CI: 2.27-9.18], households with clean latrines [AOR = 2.19, 95% CI: 1.17-4.12], households with latrines located 6 to 10 m from the dwellers [AOR = 5.94, 95% CI: 3.13-1.27], households with latrines located 6 to 10 m from the dwellers [AOR = 3.94, 95% CI: 1.93-8.03], households head not attending formal education [AOR = 0.24, 95% CI: 0.13-0.44], households without school children [AOR = 0.15, 95% CI: 0.08-0.28], households owned latrine for less than 1 year’s [AOR = 0.24, 95% CI: 0.12-0.49], Households owned latrine for 1 to 3 year’s [AOR = 0.39, 95% CI: 0.25-0.64], and latrine that does not require maintenance 1.94 [AOR = 1.92, 95% CI: 1.04-3.61], were significantly associated with latrine utilization.

CONCLUSION: The findings of this study revealed that open field defecation is still practiced by households in CLTSH implemented kebeles. Therefore, to improve latrine utilization, community awareness must be raised through regular training on proper latrine construction, latrine usage, and sanitation and hygiene practices.

KEYWORDS: Community led total sanitation, hygiene, latrine utilization

Introduction

According to 2017 World Health Organization (WHO) and United Nations International Children’s Emergency Fund (UNICEF) joint report, around the world, 13% of the population used latrines where excreta were disposed of in situ. In communities where access to improved sanitation facilities is limited, 892 million people practice open defecation (OD), the majority of whom live in rural areas of South Asia and Sub-Saharan Africa. This practice continues to be a major challenge, with approximately 2.3 billion people still lacking basic sanitation services or using unimproved facilities such as pit latrines without a slab, hanging latrines, or bucket latrines.

In the African Region, 584 million people lacked improved sanitation, and 231 million of them practiced OD. Sub-Saharan Africa remained the most lagging in terms of accelerating access to improved latrine facilities. According to regional estimates, only 30% of Sub-Saharan Africans used improved latrine facilities. According to World Health Organization (WHO)² and United Nations Children’s Fund (UNICEF) Joint monitoring program (JMP) 2021 reports, 494 million people practice open defecation. Most of (92%) these people lived in rural areas and nearly half of them lived in sub-Saharan Africa. According to 2016 Ethiopian Demographic and Health Survey (EDHS), more than half of households, 53% (43%
urban and 56% rural), use non-improved latrine facilities, with 32% (7% urban and 39% rural) still practicing OD.5

OD is a major environmental health problem facing many countries in sub-Saharan Africa. Study conducted in Ghana revealed that, 6 factors (education, household size, occupation, income, traditional norms, and beliefs and ownership of a toilet facility) were positively significant in determining OD.6 All sustainable development goal (SDG) regions saw a drop in the number of people practicing OD, except for sub-Saharan Africa, where high population growth led to an increase in OD from 204 to 220 million, and in Oceania, where the practice increased from 1 to 1.3 million.7

Community-Led Total Sanitation and Hygiene (CLTSH) is relatively a new approach pioneered by Dr. Kamal Kar through the Village Education Resource Center that focuses on empowering local people to analyze the extent and risk of OD-related environmental pollution and to construct and use toilets without the need for external subsidies. The methodology is now being used in the majority of Ethiopian regions, as well as in other parts of Asia and Africa.8 The elimination of OD is the primary goal of improving access to sanitation globally, and it is a proposed indicator for any country’s achievement of the SDGs.9

Ethiopia’s health statistics indicate communicable disease accounts for about 60% to 80% of health problems that are preventable and considerable proportions of these diseases are directly related to unsafe water, poor hygiene, and inadequate sanitation.10,11 To mitigate such problems, CLTSH has remained the only instrument to ignite community-wide behavioral change and collective action to move the entire community toward improving sanitation activities in Ethiopia.12,13 It focuses on eradicating OD at a community level by generating sustained behavioral change,14 and enables communities to conduct their sanitation profile through observation, appraisal, and analysis of their OD practice and its effects, and the heart of this approach is a paradigm shift from providing sanitation facilities to achieving collective behavioral changes with growing evidence on reducing OD usage and creating open defecation free (ODF) environments.15,16

Construction of latrine facility has been widely started in all parts of Ethiopia particularly by giving due attention to rural community since the start of health extension program.17 Sub-Saharan Africa made the least progress, having decreased the proportion of its population engaged in unsanitary practices by roughly 15%.18 Unless the speed of movement of change in the WASH sector is accelerated, the SDG 6.2 basic sanitation target may not be achieved by 2030.19 In low-income countries, diarrhea accounts for the largest share of WASH-related morbidity and mortality, causing 829,000 deaths per annum.19

Inadequate hygiene and sanitation facilities disproportionately affect vulnerable rural communities in social and economic terms. Poor hygiene and sanitation practices are also viewed as the primary risk to development, affecting the nation’s improvement in well-being, educational status, and gender equality, as well as societal and financial change on a global scale.20,21

For low-income countries like Ethiopia, a cost-effective community-based participatory approach is essential to combat diseases caused by inadequate water, sanitation, and hygiene.22 Through the process, the community is sensitized to the consequences of poor sanitary practices, commits itself to find own solutions, and finally liberates from OD. This helps to increase a receptive environment for the adoption of improved practices in personal hygiene, safe handling of food, and water as well as safe confinement and disposal of excreta and waste.23-24

According to the study conducted in Ethiopia, Clean latrine facility, bad latrine facility, presence of children in the household, traditional hat latrine facility, and age of families were significantly associated with latrine utilization.17 The intervention of CLTSH in Ethiopia include hygiene component, where basic hygiene behaviors, including hand-washing with soap and water at critical times, and safe water handling and treatment at the household level, are also addressed along with the drive to achieve ODF status in all villages of the country.25

The Ethiopian government has placed 2 interventional programs, the introduction of a health extension program since 2003/4 and CLTSH program in 2006.26,27 The interventions were held with a vision of 100% improved household and institutional hygiene & sanitation and expected to facilitate in termination of OD through consistent latrine utilization.25 However, the changes that have been recorded so far have not brought change in latrine utilization as required.26

Southern Nations Nationalities and Peoples Region (SNNPR) government was also introducing CLTSH program in various Zonal offices including Sodo wereda which is located under Gurage Zone Administration. The drivers are Community Health Promoters (CHPs) who are volunteers from the community and Health Extension Workers (HEWs), due to the severe resource constraints; the program emphasizes low-cost technology and locally available materials. Whereby many of the latrines are open pits (no slabs or structure) using local materials like logs from acacia.28

Inappropriate utilization of latrines and excreta disposal might be contributing to morbidity caused by these sanitation related conditions. In developing countries, there have been few data available concerning utilization of latrine among CLTSH implemented area and data is scarce in this particular study area. This implies that more research needs to be conducted in specific locations with different contexts to provide evidence to concerned bodies; in fact, latrine use and hygiene behavior of the community has been understudied so far, as far as the researcher's knowledge is concerned. Therefore, this study looks into latrine usage and associated factors in CLTSH-implemented rural kebeles in Soddo woreda, Gurage zone, Southern Ethiopia.
Materials and Methods

Study area

A study was conducted in Soddo woreda, Gurage zone, which is located in the Southern Nations, Nationalities, and Peoples’ Region (SNNPR) of Ethiopia, 105 km from Addis Ababa, the capital city of Ethiopia, and 197 km from Hawassa, the SNNPR capital city. Soddo woreda is bordered on the South by Meskane, and on the West, North and East by the Oromia Region. It was selected as it is one of CLTSH-implemented Woredas in Gurage zone. According to the last census in 2007, the total population of Soddo woreda was 134,683.29 In the woreda, there were 27,478 households. In the woreda, there were 29,232 rural households and 17,778 urban households. The main economic activity of the woreda were agriculture. There are 8 health centers in the woreda, 1 primary hospital, and 54 health posts.

Study design and period

A community based cross-sectional study was conducted from May 01 to June 03/2020.

Population

Source population. The source population for this study was all households found in rural kebeles (The term kebele refers to the smallest administrative units) in Soddo woreda where the CLTSH program had been implemented.

Study population. The study population consisted of sampled households in Soddo woreda that used latrines as part of the CLTSH program implementation. Thirteen kebeles were chosen at random from a total of 39 kebeles where the program had been implemented to assess latrine utilization. We used systematic sampling techniques to select study participants by using a list of households that had implemented the CLTSH program as a sampling frame.

Eligible criteria

Inclusion criteria. In selected kebeles of the district, households that owned private latrines were included in the study. Household who had stayed in the area for at least 6 months before data collection date who utilize latrine under CLTSH program were also included in the study.

Exclusion criteria. Respondents who are unable to respond due to mental disorders or other health problems and refused to participate were excluded from the study.

Sample size determination. The sample size for this study was determined by using single population proportion formula using assumptions: margin of error 5%, 95% CI: the estimated latrine utilization, 60% from a study conducted in Chencha District, Southern Ethiopia,30 and the non-response rate of 10%. By multiplying with design of 1.5 we obtain the final sample size of 609 households.

Sampling technique and procedure. The study participants were chosen using a multistage sampling technique. Soddo woreda was chosen on purpose. At the first stage, it was decided that one-third of the total kebeles would be sampled; 13 rural kebeles were chosen at random from a total of 39 kebeles (by lottery method). The number of households included from each kebele was proportionally allocated in the second stage. Each household was then chosen using a systematic sampling method. The total number of households in each kebele was taken from the administrative kebele chosen and used to calculate the sampling interval (k = N/n). Depending on number of households found in kebeles we calculated separate K value per each kebele. Following the first randomly selected household, households at every Kth interval were visited.

Variables

Dependent variable. Latrine utilization

Independent variables. Socio-demographic and economic factors: age, sex, marital status, educational level of the head of the household, household head’s occupation, household’s monthly income (which calculated from the annual income in monetary terms), Schoolchidren’s presence, the presence of children under the age of 5, residential setting.

Behavioral factors: frequency of latrine use, observable feces in the compound and latrine, Frequency of latrine cleaning and cleanliness of latrine, disposal means of children feces.

Environmental Characteristics: Place of defecation, Latrine whether it is full, free from feces inside and around, clean latrine, Pit not full, free from feces inside and around the structure, area properly swept and absence of bad smell at time of data collection.

Operational definitions. Functional Latrine: Is a facility which is found providing service to households during data collection even if it needs maintenance.31

Latrine Utilization: was defined as the use of the latrine by all the family members (above 5 years) in the households, that own private latrine.32

Satisfactory latrine utilization: A household with a functional latrine and no feces visible in the compound, as well as at least 2 signs of latrine use.32

Unsatisfactory latrine utilization: A household with latrine not fulfill the criteria of satisfactory latrine utilization.32

Clean latrine: Pit not full, free from feces inside and around the structure, area properly swept and absence of bad smell at time of data collection.31

School children: Refers to the presence of children’s attending formal education at elementary school and above in the family.
Data collection procedures. Data was collected using a questionnaire and an observational checklist adapted from previous literature. The questionnaires were administered face to face by a trained interviewer, and the observation checklist was used to assess signs of latrine usage such as a visible footpath leading to the latrine, observable splash water or urine on the latrine floor, the presence of fresh feces observed inside the latrine's squat hole, and the observation of at least 1 fly in the latrine.

Data quality control. To ensure data quality, the questionnaires and checklist were created in English, then translated into the local language, and finally back-translated into English by language experts to ensure consistency. Data collectors and supervisors received 2 days of training on data collection procedures. The questionnaire was pre-tested on 5% of the sample to ensure data quality (Cronbach’s alpha is .81). Consistent and routine monitoring of data collectors was also carried out to maintain the quality of the data collection process, with thorough approval of the completeness and consistency of the data, followed by feedback during data collection. The data were checked and corrected anything unclear, missing, and ambiguous.

Data processing and analysis. The collected data were entered into epi-data version 3.1 and analyzed using the statistical package for social sciences (SPSS) version 20. Descriptive statistics like frequency, proportions, and mean were used. To determine which variables were associated with the dependent variable, bivariable analysis was applied to each independent variable. Hosmer and Lemeshow goodness of test and Multicollinearity were checked respectively. Variables with $P < .25$ in the bivariable analysis were entered into the multivariable logistic regression model and a $P$-value less than .05 was declared to be significant.

Results

Socio demographic characteristics

This study included 585 study participants, with a response rate of 96%. The majority of study participants 438 (74.9%) were females, and 284 (48.5%) were between the ages of 36 and 44 years. About 352 (60.2%) of study participants were not attended formal education. In terms of religion, 402 (68.7%) were Orthodox, and the majority 414 (70.7%) were married. About 347 (59.3%) of respondents had 5 or more family members, and 383 (65.5%) of respondents' households had school children. The majority of participants 254 (43.4%) earned an average monthly income of 39 USD (Table 1).

Availability of sanitation facilities

The majority of households in the woreda, 537 (91.7%), used simple pit latrines, and 544 (86.2%) built their latrines with locally available materials. More than half of the latrines, or 58.6%, were more than 10 m away from dwellers. The majority

| VARIABLES | FREQUENCY (%) |
|-----------|---------------|
| Gender    |               |
| Male      | 147 (25.1)    |
| Female    | 438 (74.9)    |
| Educational status |    |
| Not attended formal education | 352 (60.2) |
| Attended formal education | 233 (39.8) |
| Age       |               |
| 18-26 years | 37 (6.3)       |
| 27-35 years | 142 (24.3)     |
| 36-44 years | 284 (48.5)     |
| >45 years  | 122 (20.9)     |
| Religion  |               |
| Orthodox  | 402 (68.7)     |
| Catholic  | 10 (1.7)       |
| Protestant| 132 (22.6)     |
| Muslim    | 41 (7.0)       |
| Marital status |     |
| Single    | 57 (9.7)       |
| Married   | 414 (70.8)     |
| Divorced  | 64 (10.9)      |
| Separated | 18 (3.1)       |
| Widowed   | 32 (5.5)       |
| Family size |            |
| <5        | 238 (40.7)     |
| ≥5        | 347 (59.3)     |
| Presence of school children | 383 (65.5) |
| Occupation |             |
| Farmer    | 418 (71.5)     |
| Merchant  | 78 (13.3)      |
| Housewife | 8 (1.4)        |
| Private   | 61 (10.4)      |
| Labor daily | 20 (3.4)      |
| Income (United States Dollar) |       |
| <39 USD   | 254 (43.4)     |
| 40-59 USD | 187 (32.0)     |
| 41-79 USD | 89 (15.2)      |
| 80-99 USD | 28 (4.8)       |
| >100 USD  | 27 (4.6)       |
of the available latrines, 458 (78.3%), were not surrounded by vegetation. Only 107 (18.7%) of latrines had a door, and 60 (10.3%) of household latrines had a squat hole cover. The majority of the observed latrines, 52.5%, had been in use for more than 3 years, and only 80 (13.7%) of the latrines had nearby hand washing facilities. However, only 15 (18.8%) of hand washing stations were found to have adequate supply of water and soap (Table 2).

Behavioral factors

All study participants were given information about the CLTSH program. The majority of study participants, 339 (57.9%), were informed about the CLTSH program by local health personnel. In this study, 428 (73.2%) of households were familiar with all CLTSH triggering steps. From these, 382 (89.3%) remembered the pre-triggering phase of the CLTSH steps, and 545 (93.2%) explained that community volunteers were appointed to mobilize and maintain household and environmental sanitation. In terms of techniques used to ignite the community, 236 (46.6%) of households reported that community facilitators were using the transit walk technique to achieve an ODF environment (Table 3).

Latrine utilization

The overall latrine utilization rate in the study woreda was 65.8% (95% CI: 61.8-69.8). The majority of households, 89 (44.5%) prefer to defecate around bushes and 71 (35.5%) prefer to defecate in open fields. Respondents' main reasons for children not using latrines were: large squat hole 120 (37.5%). In terms of latrine cleaning frequency, 212 (36.2%) of households clean their latrines only infrequently, and more than half, 323 (55.2%) of latrines observed were dirty. The vast majority of respondents, 376 (64.3%), wash their hands before eating. Flies were observed in 382 (65.3%) of the households' latrines (Table 4).

Factors affecting latrine utilization

In multivariable logistic regression analysis, educational status, the number of members of the household, presence of school-aged children in the home, the year the latrine was built, the distance from the house, the need for maintenance, the presence of vegetation around the latrine, and the cleanliness of the latrine were all factors significantly associated with proper latrine utilization. However, the presence of a wall for privacy, and the presence of squat hole cover were not significantly associated with latrine utilization.

According to the findings, household heads who were not attended formal education were 76% [AOR=0.24, 95% CI: 0.13-0.44] less likely to use their latrine than mothers who could read and write and above. Households with fewer than 5 family members were 2.53 [AOR=2.53, 95% CI: 1.33-4.84] times more likely to use the latrine than those with 5 or more family members. Households without school children were

| VARIABLES | FREQUENCY (%) |
|-----------|---------------|
| Type of latrine | |
| Trench | 27 (4.6) |
| Simple pit latrine | 537 (91.7) |
| VIP latrine | 21 (3.6) |
| Latrine construction | |
| Locally available | 504 (86.2) |
| Locally unavailable materials | 11 (1.9) |
| Mixed materials | 70 (12.0) |
| Latrine with door | 107 (18.7) |
| Latrine with roof | 434 (74.2) |
| Latrine with slab | 465 (79.5) |
| Latrine with wall for privacy | 474 (81.0) |
| Distance of latrine from the house | |
| <6m | 114 (19.5) |
| 6-10m | 128 (21.9) |
| >10m | 343 (58.6) |
| Latrine need maintenance | 354 (60.5) |
| Part of latrine needs maintenance (n=354) | |
| Super structure | 128 (36.2) |
| Slab | 38 (10.7) |
| Roof | 20 (5.6) |
| Mixed | 168 (47.5) |
| Presence of vegetation around latrine | 127 (21.7) |
| Presence of squat hole cover | 60 (10.3) |
| Hand washing facility near to latrine | 80 (13.7) |
| Detergent for hand washing (n=80) | |
| Only water | 65 (81.2) |
| Water and soap | 15 (18.8) |
| Time taken to fetch water for round trip | |
| <30 min | 332 (56.8) |
| 30-60 min | 122 (20.9) |
| >60 min | 131 (22.4) |
| Duration of latrines since constructed | |
| <1 year | 70 (12) |
| 1-3 year | 208 (35.5) |
| >3 year | 307 (52.5) |
Environmental Health Insights

According to this study, households with a latrine in service for less than a year are 76% [AOR = 0.24, 95% CI: 0.12-0.49] less likely to use it than those with a latrine in service for more than 3 years, and those with a latrine in service for 1 to 3 years are 61% [AOR = 0.39, 95% CI: 0.25-0.64] less likely to use it than those with a latrine in service. Households with latrines less than 6 m and between 6 and 10 m away from the house were 5.94 [AOR = 5.94, 95% CI: 3.13-11.27] and 3.94 [AOR = 3.94, 95% CI: 1.93-8.03] times more likely to use them, respectively, than those with latrines more than 10 m away. When comparing households with a latrine that does not require maintenance to households with a latrine that does require maintenance, the odds of using the latrine were 1.94 [AOR = 1.94, 95% CI: 1.04 -3.61] times less likely.

85% [AOR = 0.15, 95% CI: 0.08-0.28] less likely to use the latrine than school children.

### Table 3. Distribution of respondents behavioral characteristics in the rural community of Soddo Woreda, Gurage Zone, Southern Ethiopia, 2020.

| VARIABLES | FREQUENCY (%) |
|-----------|---------------|
| Source of information about CLTSH | |
| Local health Staff | 339 (57.9) |
| Award during formal training | 61 (10.4) |
| Local NGO | 124 (21.2) |
| Political leaders | 50 (8.5) |
| Neighbors and peers | 11 (1.9) |
| Accept the need of CLTSH program | 498 (85.1) |
| Reason not to accept the need of CLTSH program (n=87) | |
| I don’t see its usefulness | 21 (24.1) |
| I didn’t recognize it | 66 (75.9) |
| Familiar with CLTSH steps | 428 (73.2) |
| Remember the pre-triggering phase (n=428) | 382 (89.3) |
| Remember the triggering phase (n=428) | 347 (81.1) |
| Remember the post- triggering phase (n=428) | 111 (25.9) |
| Remember the scaling up and going beyond CLTS phase (n=428) | 34 (7.9) |
| Practice of social mobilization | 506 (86.5) |
| Techniques used to ignite the community (n=506) | |
| Transect walk | 236 (46.6) |
| Feces/sanitation mapping | 184 (36.4) |
| Feces/shit calculation | 45 (8.9) |
| Feces mobility cart | 41 (8.1) |
| Presence of community motivators volunteers | 545 (93.2) |

### Table 4. Distribution of respondents latrine utilization characteristics in the rural community of Soddo Woreda, Gurage Zone, Southern Ethiopia, 2020 (n = 585).

| VARIABLES | FREQUENCY (%) |
|-----------|---------------|
| Latrine utilization | 385 (65.8) |
| Frequency of latrine use (n=385) | |
| Daily | 238 (61.8) |
| Mostly | 132 (34.3) |
| Rarely | 15 (3.9) |
| Where do residents who don’t use latrines defecate? (n=200) | |
| Open field | 71 (35.5) |
| Rivers | 15 (7.5) |
| Around bushes | 89 (44.5) |
| Backyards | 25 (12.5) |
| Reason for not using latrine by ⩽ 5 children (n=320) | |
| Floor not safe stand on | 100 (31.3) |
| Large squat hole | 120 (37.5) |
| Latrine not clean | 39 (12.2) |
| Unreasonable bad smell | 10 (3.1) |
| Being child | 51 (15.9) |
| Place of disposing feces of ⩽ 5 children (n = 320) | |
| In the compound | 83 (25.9) |
| Outside the compound | 62 (19.4) |
| In the bush/tree | 23 (7.2) |
| Disposing by burying | 19 (5.9) |
| In the pit latrine | 133 (41.6) |
| When do you wash your hands (Multiple response allowed)? | |
| After defecation | 338 (57.8) |
| After cleaning child’s bottom | 227 (38.8) |
| Before feeding children | 169 (28.9) |
| Before preparing food | 314 (53.7) |
| Before eating food | 376 (64.3) |
| Poor cleanliness of latrine | 323 (55.2) |
| Frequency of cleaning latrine | |
| Daily | 71 (12.1) |
| When dirty | 172 (29.4) |
| Rarely | 212 (36.2) |
| Never cleaned | 130 (22.2) |
| Presence of fly inside latrine | 382 (65.3) |
higher. The odds of using the latrine were 4.56 [AOR = 4.56, 95% CI: 2.27-9.18] times higher in households with no vegetation around their latrine than in households with vegetation around their latrine. Households with clean latrines were 2.19 [AOR = 2.19, 95% CI: 1.17-4.12] times more likely to use their latrines than those with dirty latrines (Table 5).

Discussion
Lack of water, sanitation, and hygiene facilities, as well as poor practices, are major development challenges, affecting the nation’s improvement in well-being, educational status, and gender equality, as well as societal and financial change. According to the findings of this study, the overall latrine utilization rate was 65.8%, (95% CI: 61.8-69.8). The findings of this study were higher than those of previous studies conducted in Hulet Ejju Enessie Woreda, East Gojjam Zone (61%),33 and the study conducted in Laelay Maichew district, North Ethiopia (46.8%).34 However, lower than the study conducted in Wondo Genet District, Southern Ethiopia (83.1%).35 The differences could be explained by differences in the study areas’ CLTSH program implementation.

Households with heads who could not attend formal education were 76% less likely to use the latrine than households with heads who could attend formal education. The findings were consistent with those of a study conducted in the Dembiya District.36 This could be due to illiterate people’s resistance to change and preference for old practices such as open defecation. As a result, head illiteracy may have a negative impact on latrine utilization in the home.

Households without school children were 85% less likely to use latrines than households with school children. The findings of this study were consistent with those of a study conducted in the Gulomekada District of Tigray Region.37 This could be due to a lack of adequate information about latrine usage in households without school children.

Households with 5 or more members were 2.53 times more likely to use the restroom. This could be due to the fact that the proportion of shits dropped in constructed latrines had no effect. According to this study, the duration of a latrine since it was built (latrine in service) was 76%, and latrines aged 1 to 3 years were 61% less likely to be used than those with a 3 year history of use. A similar study in Gulomekada District, Tigray Region, supports this finding.37 The newer latrine might not be constructed after the household’s knowledge about latrine utilization was improved and may not immediately understand the benefit of using latrine.

Households that locate their latrine within 6 m and between 6 and 10 m of their residence were found to be 5.94 and 3.94 times more likely to use their latrine, respectively, than those that locate their latrine more than 10 m from their residence. This finding is similar to that of a study conducted in the Laelay Maichew district of North Ethiopia.34 It is primarily due to the fact that latrines located a long distance from the house were inconvenient for disabled and elderly household members to use.

Households whose latrines were not in need of maintenance at the time of data collection were 1.94 times more likely to use their latrines than those whose latrines were in need of maintenance. This finding is consistent with the findings of a study conducted in Awabel District, Northwest Ethiopia.38 This might be due to the fact that households who had latrines out of maintenance need may feel more secure and got privacy during latrine utilization.

Households with no vegetation around their latrine were 4.56 times more likely to use it than households with vegetation around the latrine. This could be because households whose latrine was free of vegetation were encouraged to use their latrine due to privacy concerns.

Households with clean latrines were 2.19 times more likely to use latrines than counters. This study was similar to the one conducted in Laelay Maichew Woreda, Northern Ethiopia.39 The possible reason for this is that users prefer to have a clean and better using environment that is appealing and attractive to use rather than unclean latrines.

Conclusion
Based on the findings of this study, we concluded that open field defecation is still practiced by rural residents in CLTSH-implemented kebeles. Latrine utilization were significantly associated with mothers’ educational status, family size, latrine maintenance, the presence of school children, the age of the latrine, the distance of the latrine from the house, the presence of vegetation around the latrines, and the cleanliness of the latrines. Therefore, there is a need to raise community awareness by providing regular training on proper latrine construction, latrine usage, and sanitation and hygiene practices. Health workers, community leaders and local authorities should give special emphasis to improve utilization of latrine and it needs to put due attention on the aforementioned factors to promote hygiene and sanitation behavior of the community.

HEW’s and the Local Government should initiate and sustain measures such as training of community engineers and natural leaders on sanitation and hygiene, and sensitization of communities to improve hygiene and sanitation behavior to end Open Defecation (OD) by promoting consistent latrine utilization. Furthermore, strengthen and increase measures that improve the implementation of the CLTSH approach such as follow up of triggered villages until declare of Open Defecation Free (ODF) status. Moreover, follow up of organized interventions performance and provide comprehensive and supportive feedback to performers on time.40
### Table 5. Multivariable logistic regression analysis of factors affecting latrine utilization in the rural community of Soddo Woreda, Gurage Zone, Southern Ethiopia, 2020 (n = 585).

| VARIABLES                        | LATRINE UTILIZATION | COR (95% CI)                  | AOR (95% CI)                  | P-VALUE  |
|----------------------------------|---------------------|--------------------------------|--------------------------------|----------|
|                                  | YES (%)             | NO (%)                        |                               |          |
| Educational status               |                     |                                |                               |          |
| Not attended formal education    | 190 (53.97)         | 162 (46.03)                   | 0.23 (0.15-0.34)              | 0.24 (0.13-0.44) | .001**  |
| Attended formal education        | 195 (83.69)         | 38 (16.31)                    | 1.00                          | 1.00     |         |
| Family size                      |                     |                                |                               |          |
| <5                               | 185 (77.7)          | 53 (22.3)                     | 2.57 (1.77-3.72)              | 2.53 (1.33-4.84) | .005*   |
| ≥5                               | 200 (57.6)          | 147 (42.3)                    | 1.00                          | 1.00     |         |
| Presence of school children      |                     |                                |                               |          |
| Yes                              | 272 (71.0)          | 111 (30.0)                    | 1.00                          | 1.00     | .001**  |
| No                               | 113 (56.0)          | 89 (44.0)                     | 0.52 (0.36-0.74)              | 0.15 (0.08-0.28) |         |
| Presence of wall for privacy     |                     |                                |                               |          |
| Yes                              | 322 (69.93)         | 152 (30.07)                   | 1.61 (1.06-2.46)              | 1.26 (0.72-2.21) | .414ns  |
| No                               | 63 (56.75)          | 48 (43.25)                    | 1.00                          | 1.00     |         |
| Year since latrine constructed   |                     |                                |                               |          |
| <1 year                          | 28 (40.0)           | 42 (60.0)                     | 0.17 (0.10-0.30)              | 0.24 (0.12-0.49) | .001**  |
| 1-3 years                        | 113 (54.3)          | 95 (45.7)                     | 0.31 (0.21-0.45)              | 0.39 (0.25-0.64) | .001**  |
| ≥3 years                         | 244 (79.5)          | 63 (20.5)                     | 1.00                          | 1.00     |         |
| Distance of latrine to house     |                     |                                |                               |          |
| <6 m                             | 96 (84.2)           | 18 (15.8)                     | 4.66 (2.70-8.05)              | 5.94 (3.13-11.27) | .001**  |
| 6-10 m                           | 106 (82.8)          | 22 (17.2)                     | 4.21 (2.54-6.99)              | 3.94 (1.93-8.03) | .001**  |
| >10 m                            | 183 (53.3)          | 160 (44.7)                    | 1.00                          | 1.00     |         |
| Latrine needs maintenance        |                     |                                |                               |          |
| Yes                              | 196 (55.4)          | 158 (44.6)                    | 1.00                          | 1.00     | .037*   |
| No                               | 189 (81.8)          | 42 (18.2)                     | 3.63 (2.44-5.38)              | 1.94 (1.04-3.61) |         |
| Presence of vegetation           |                     |                                |                               |          |
| Yes                              | 71 (55.9)           | 56 (44.1)                     | 1.00                          | 1.00     | .001**  |
| No                               | 314 (68.6)          | 144 (31.4)                    | 1.72 (1.15-2.57)              | 4.56 (2.27-9.18) |         |
| Presence of squat hole cover     |                     |                                |                               |          |
| Yes                              | 334 (63.6)          | 191 (36.4)                    | 3.24 (1.56-6.73)              | 1.33 (0.43-4.08) | .62ns   |
| No                               | 51 (85.0)           | 9 (15.0)                      | 1.00                          | 1.00     |         |
| Cleanliness of latrine           |                     |                                |                               |          |
| Yes                              | 214 (81.7)          | 48 (18.3)                     | 3.96 (2.71-5.81)              | 2.19 (1.17-4.12) | .015*   |
| No                               | 171 (52.9)          | 152 (47.1)                    | 1.00                          | 1.00     |         |

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; COR, crude odds ratio; Significant at *P < .05, **P < .01, ns, not significant; 1.00, Reference
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Author Contribution
ETW contributed to conceiving and designing the study. AE, TA, and ZA analyzed and interpreted the data. AE and ZA wrote the manuscript. All the authors read and approve the final manuscript.

Availability of Data
Data will be made available by request.

Ethical Consideration
Both verbal and written consent were considered and supportive letters from Hawassa University and different stakeholders has been secured and also Approval from IRB of the university was secured (approval no./ID: IRB/096/12, Date 20 April 2020) before the implementation of the research.

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