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Research Article

Latrine Utilization and Factors Associated among Rural Community in Chire Woreda at Sidama National Regional state, Ethiopia: A Community-based Cross-sectional Study

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ABSTRACT

Background: In low income countries like Ethiopia; lack of sanitation is a serious health risk, affecting billions of people, particularly the poor people. The better health and quality of life, sanitation, and hygiene conditions are among the major causes of public health problems. Therefore, this study aimed to assess utilization and associated factor of latrine in rural communities.

Methods: A community-based cross-sectional study was conducted among 793 randomly selected households. The data were collected through an interview by pre-tested questionnaires and observation checklist. Data entry and analysis for descriptive and logistic regression models by SPSS v.20.

Results: The utilization of latrine was 71.5%. It associated with being younger age [AOR 1.83, 95% CI:1.11, 3.02], who had attended secondary & above [AOR 4.17, 95% CI:1.10, 15.94], monthly income more than 1000 Ethiopian Birr (ETB), [AOR 5.17, 95% CI: 3.10, 8.72], family size [AOR 3.19, 95% CI: 1.97, 5.17], latrine inside the compound [AOR 2.47, 95% CI: 1.64, 3.71] as compared with their counterparts were more used latrine.

Conclusions: The utilization of latrine was low and still needs, to improve awareness of the community there is a need of health education programs regarding improved use of latrine, cleanliness of latrine, constructing latrine inside the compound and maintenance of latrine for the proper utilization including children should be considered.

Keywords: Latrine utilization; Rural communities; Chire district; Sidama regional state

INTRODUCTION

Worldwide lack of sanitation is a serious health risk, affecting billions of people around the world, particularly the poor and disadvantaged people around the world [1]. Lack of sanitation facilities compels people to practice open defecation and this increases the risk of transmission of diseases [2]. The disease burden associated with poor water, sanitation, and hygiene is estimated to account for 4.0% of all deaths and 5.7% of the total disease burden in Disability-Adjusted Life Year (DALYs) in worldwide, principally through diarrheal diseases. About 1.8 million people die every year due to diarrheal diseases, and children under the age of 5 years account for 90% of diarrheal deaths [3,4]. Moreover, 88% of diarrheal diseases are attributed to unsafe water supply, inadequate sanitation, and poor hygiene [5].

In most developing countries, especially in Sub- Saharan Africa (SSA), the basic causes of more than 80% of the diseases are inadequate and unsafe water supply and improper disposal of waste. Ethiopia is among the poorest countries in the world, ranking 170 out of 177 in the UN human development index and is the second-most populous country in Africa (population estimated above 80 million). Yet, Ethiopia's rural populations are among the least served with a rural water supply and sanitation access at only 24% and 8% respectively [6].

However, the Provision of sanitation facilities initiated in all parts of Ethiopia with interventions of a health extension program and continued investments to increase access to safe water and improved sanitation [7]. The studies conducted in different parts of Ethiopia showed that the latrine utilization level differs from region to region of the country and from district to district within the same region depending on many factors. In the study area, there is no available research conducted on a similar topic. Therefore, this study was designed to assess the latrine utilization level and associated factors of rural community separately in the study area. This study can provide evidence or information regarding the latrine utilization in open defecation and its determinant factors which can be used for public health officials, clinicians, and health planners to reduce the impacts of poor utilization of latrine.

MATERIALS AND METHODS

Study setting and design

This study was conducted in Chire District, at Sidama National Regional state, Ethiopia, Southern Ethiopia, which located about 396 km away to the South of Addis Ababa, the capital city of Ethiopia. By the end of 2018, latrine coverage was 99.8% but utilization not known. It has a climatic condition of Dega and Weyna Dega. The total number of households is estimated to be 41355 within the average household size of 4.9 and of these households, about 97% of them have latrine facilities. The source population was all rural community households. While all selected households with latrine facilities in the rural community of districts were considered as the study population. Among this, all randomly selected adults of the household and who are residents in selected kebele were included in the study. All adults who were critically ill that were not able to respond appropriately for the interviews were excluded from the study.

Sampling and sampling technique

The sample size (n) was calculated using the following single population proportion formula based on the assumption of 61% proportion (p) from Dembia district [8], 95% C.I (1.96), 5% margin of error (d), 2 design effect and adding 15% contingency. n =

$$(Z_{1-\alpha/2})^2 \frac{P[1-P]}{d^2}$$

n = (1.96)2(0.61) (0.39) = 365

Therefore, the required sample size was n = (365 x 2) = 10% (730) +73.0 = 803 HHs with latrines included in the study.

A multistage random sampling technique. In the 1st stage, ten out of 27 rural kebeles were selected by Simple Random Sampling (SRS) technique. In the 2nd stage, the sample size was proportionally allocated. In the last stage, only one randomly selected eligible person was interviewed (Figure 1).

Data collection tools, and procedures

The data were collected through an interview by pre-tested questionnaires and observation checklist. The questionnaires were translated into the "Sidamic language" and validated before the study time was done outside of the study area and necessary modifications were done based on the findings. Data on utilization of latrine, a survey was carried out with direct observation check list the status of the households in selected kebele. Trained data collectors,

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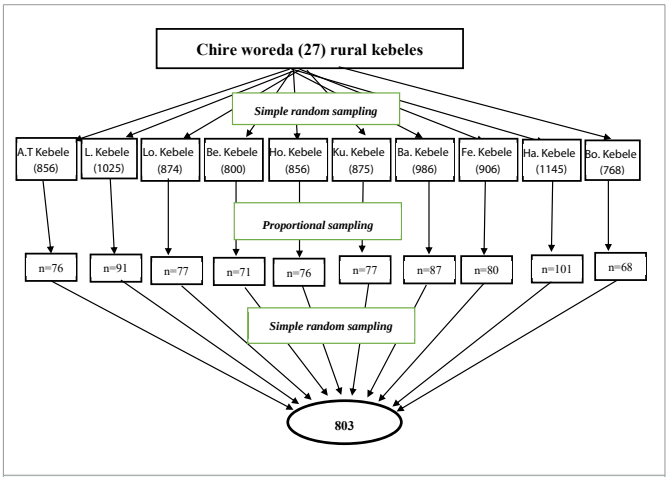

Figure 1: Schematic representation of proportional allocation to sample size.

health workers have collected the data. Principal investigators and supervisors follow the data collection process and check them for consistency and completeness.

Data analysis

Data entry, cleaning, and analysis were done by SPSS V. 20. Descriptive analysis including frequency distribution and the percentage was made to determine the latrine utilization, to describe socio-economic and demographic, environmental, behavioral, knowledge and attitude related variables. All factors with p-value < 0.25 in the bivariate logistic regression analysis were a candidate to the multivariable model to control confounding effects. The Hosmer-Lemeshow goodness-of-fit statistic was used to assess whether the necessary assumptions for the application of multiple logistic regression are fulfilled. Odds Ratios (OR) with 95% Confidence Intervals (CI) were calculated. Finally, p-value < 0.05 declared a significant association.

Operational definitions

Satisfactory latrine utilization: is a latrine that provided services at the time of data collection even if the latrine required maintenance. A latrine is utilized when households had functional latrines, no observable faces in the compound, observable feces through the squat hole, and the foot-path to the latrine is uncovered with grasses.

Status of latrine: which needs maintenance or not at the time of data collection on it's a door (any cover), a leaking roof and sagging walls.

The critical time for handwashing practice – handwashing practices mainly after visiting latrines or cleaning bottoms of children, before preparing food and before feeding children

A Child-friendly feature of latrine facility: means availability of at least one of the following features; small squatting hole, lower seat, and presence of potty.

RESULTS

Socio-demographic characteristics

A total of 793 participants were interviewed yielding a response rate of 98.75%. The majority of the studied participants were 482 (60.8%) female by sex and 770(97.1%) were married. About 322 (40.6%) participants were in the age range of 26-35 years, while 281 (35.4%) mothers and 288 (36.3%) fathers had completed primary level education, respectively. More than half, 530 (66.8%) of the respondents were housewives. Nearly 693 (87.4%) of the households had under five years old children in the household (Table 2).

Knowledge and attitude towards of latrine utilization

The overall knowledge of latrine utilization was 590 (74.4%) had good knowledge. The majority of 715 (90.2%) knew the benefit of using a latrine. The study participants claim to use latrine because of 77.5% privacy, and 69.5% prevent excreta related diseases. Among study participants, only, 335 (42.2%) had a positive attitude towards latrine utilization. The study participants who agreed that the main obstacles to using latrine were beliefs 55.6% were lack of construction tools, 67.2% believe that it is the responsibility of husband and 33.3% government.

Environmental and behavioral characteristics

The majority of the study participants prefer to locate their latrine 520 (65.6%) were inside the compound. More than half 513 (64.7%) were constructed between 1-3 years ago. While 202 (25.5%) households had feces and urine around the latrine and 89 (11.2%) had still faeces and urine around the home. On another hand, 91.0% had no handwashing facility near the latrine, 91.6% had no water for handwashing. Regarding the behavioral practice, Out of 793 respondents who had latrine facility, 90.0% had simple pit latrine, improved ventilated 2.4% and 7.6% were other types of the latrine (Figure 2). While, out of 229 (28.9%), 32.0% pit, 38.7% floor, and 29.3% whole part of the latrine needs maintenance, respectively. The reasons given by respondents for why under-five children did not use the latrines were: being just a child 258 (37.2%), large squatting hole 226 (32.6%), and the floor was not safe to stand on 209 (30.2%).

Utilization of latrine

Table 1: Socio-demographic characteristics of respondents, Chire district at Sidama Regional state, Ethiopia, 2020.

Variable	Category	No.	%
Age of the respondent			
	18-25	240	(30.3)
	26-35	322	(40.6)
	≥ 35	231	(29.1)
Sex			
	Male	311	(39.2)
	Female	482	(60.8)
Marital status			
	Married	770	(97.1)
	Single	4	(.5)
	Divorced	6	(.8)
	Widowed	13	(1.6)
Educational status of the Mother			
	Illiterate	233	(29.4)
	Read and write/primary	281	(35.4)
	High school & above	279	(35.2)
Educational status of the Father			
	Illiterate	219	(27.6)
	Read and write/primary	288	(36.3)
	High school & above	286	(36.1)
Occupation of Mother			
	Housewife	530	(66.8)
	Merchant	155	(19.5)
	Farmer & Others	108	(13.6)

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Table 2: Bivariable and multivariable logistic regression analysis of latrine utilization factors in a household from Chire district at Sidama National Regional state, Ethiopia, 2020.

	Category	Latrine utilization				COR (95% CI)	AOR (95% CI)
		Yes No. (%)		No No. (%)			
Age of the respondent							
	18-25	189	(78.8)	51	(21.3)	2.24(1.49, 3.37)**	1.83(1.11, 3.02)*
	26-35	234	(72.7)	88	(27.3)	1.61(1.12, 2.31)*	1.28(0.82, 1.99)
	≥ 35	144	(62.3)	87	(37.7)	1	1
Educational status of the Mother							
	No formal education	104	(44.6)	129	(55.4)	1	1
	Primary education	214	(76.2)	67	(23.8)	3.96(2.72, 5.78)***	3.68(1.47, 9.17)**
	Secondary & above	249	(89.2)	30	(10.8)	10.29(6.51, 16.28)***	4.17(1.09, 15.94)*
Educational status of the Father							
	No formal education	97	(44.3)	122	(55.7)	1	1
	Primary education	218	(75.7)	70	(24.3)	3.92(2.68, 5.72)***	1.25(0.33, 4.68)
	Secondary & above	252	(88.1)	34	(11.9)	9.32(5.96, 14.57)***	1.31(0.52, 3.28)
Occupation of Mother							
	Housewife	385	(72.6)	145	(27.4)	1.83(1.19, 2.80)**	1.51(0.88, 2.57)
	merchant	118	(76.1)	37	(23.9)	2.19(1.29, 3.74)**	1.60(0.94, 2.73)
	Farmer	64	(59.3)	44	(40.7)	1	1
The household monthly income in ETB							
	≤ 24 $	64	(40.3)	95	(59.7)	1	1
	24 $ - 66.4 $	267	(77.6)	77	(22.4)	5.15(3.43, 7.72)***	4.12(2.54, 6.70)***
	> 66.4 $	236	(81.4)	54	(18.6)	6.49(4.21, 10.01)***	5.17(3.06, 8.72)***
Under 5 years children in the household							
	No	62	(62.0)	38	(38.0)	1	1
	Yes	505	(72.9)	188	(27.1)	1.65(1.06, 2.55)*	1.28(0.69, 2.37)
Household size can affect latrine use							
	No	239	(57.5)	177	(42.5)	1	1
	Yes	328	(87.0)	49	(13.0)	4.96(3.47, 7.10)***	3.19(1.97, 5.17)***
Location of the latrine							
	Inside the compound	154	(56.4)	119	(43.6)	1	1
	Outside the compound	413	(79.4)	107	(20.6)	2.98(2.17, 4.11)***	2.47(1.64, 3.71)***

NB: *p*-value < 0.05 =*; *p*-value < 0.01 =**; *p* value < 0.001 =***, **COR:** Crude Odds Ratio, **AOR:** Adjusted Odds Ratio, **CI:** Confidence Interval, **1:** reference.

Out of 793 respondents, 567 (71.5%) households had satisfactory utilized latrines with [95% CI: 68.3% - 74.4%] (Figure 3). Out of 212, the study participant's claim as the main reason for not using a latrine, 59.7% reports latrine is not functional, 22.7% due to far from the house and 9.2% claims using latrine is inconvenient during the rainy season and at night without proper roof and door.

Associated factors of the utilization of latrine

In bivariable logistic regression analysis the variables which had statistically significant association and the highest latrine utilization was noticed among; younger age had, who attend primary and above education fathers, attend primary and above for the mother, the estimated average monthly income of the household above 24 USD$ per a month, and the households who had latrine inside had *p*-value < 0.001 and higher proportion of the utilization of the latrine. In addition to this, occupation of mother, had under 5 years children in the household and high number of household size can affect latrine use also had *p*-value < 0.05 and higher proportion of the utilization of the latrine.

In the multivariate analysis age of the respondent, the educational status of the mother, average monthly income of the household, household size can affect latrine use and location of the latrine was remained associated with latrine utilization. The younger age had [AOR 1.83, 95% CI: 1.11, 3.02], a significant association with latrine utilization as compared with the 35 years and older age. A mother who had primary education [AOR 3.68, 95% CI: 1.47, 9.17] and secondary and above [AOR 4.17, 95% CI: 1.10, 15.94] as compared with no formal education. The household monthly income more than 66.4 $, [AOR 5.17, 95% CI: 3.10, 8.72], Household family size [AOR 3.19, 95% CI: 1.97, 5.17], the households who had latrine inside the compound [AOR 2.47, 95% CI: 1.64, 3.71] as compared with their counterparts (Table 2).

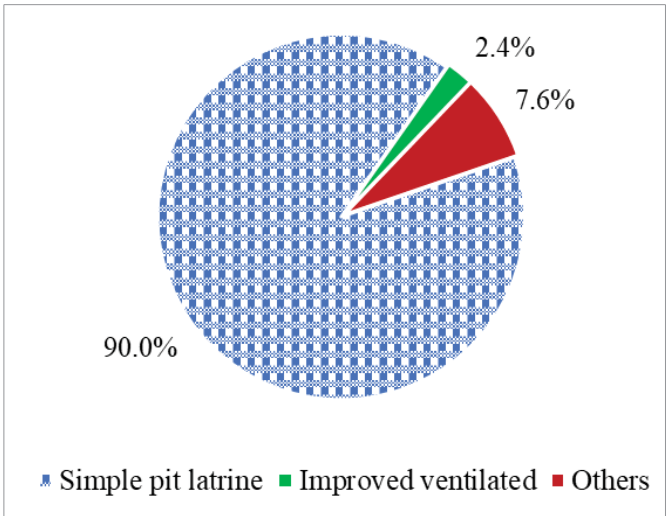

Figure 2: Types of latrine of household, Chire district at Sidama National Regional state, Ethiopia, 2020.

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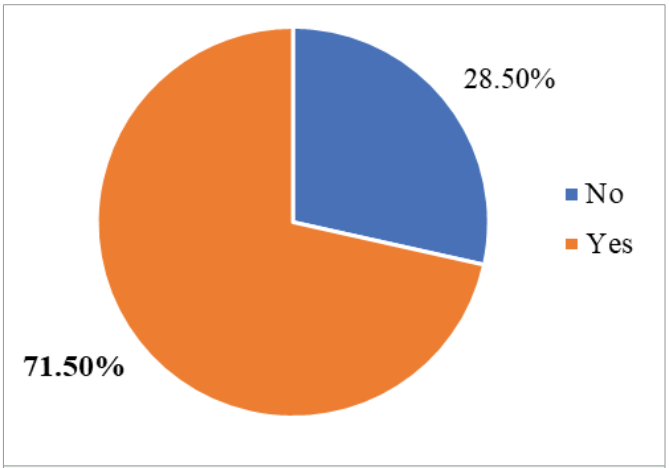

Figure 3: Utilization of latrine of the household from Chire district at Sidama National Regional state, Ethiopia, 2020.

DISCUSSIONS

This community-based cross-sectional study revealed that the utilization of latrine among selected households was 71.5% with [95% CI: 68.3% - 74.4%]. Out of 212, the study participants claim as the main reason for not using the latrine, 59.7% reports latrine is not functional, 22.7% due to far from the house and 9.2% claims using latrine is inconvenient during the rainy season and at night without proper roof and door. The reasons given by respondents for why under-five children did not use the latrines were: being just a child 37.2%, large squatting hole 32.6%, and the floor was not safe to stand on 30.2%. This was consistent with study findings done in Nigeria level of latrine utilization `was 69% [9], 73% rural Becho district of central Ethiopia [10]. This similarity may due to the study participants in the Africa had almost had at similar socio-economic status and practice of the latrine utilization at the rural community.

This finding was lower than 88% Democratic Republic of Congo [6], 89.9% rural village of Eastern Nepal [11], 93% Mirab Abaya and Alaba [12], 86.7% Hulet Ejju Enessie district [13]. Higher than study in Bahr Dar Zuria (62%) [14] and 61.2% in rural areas of Denbia district, Northwest Ethiopia [8]. This difference in the utilization of latrine was among selected households from Chire district might be due to socio-economic differences, different interventions among locally officials and interventions of the different projects among different regions in the present day and time of the study [15]. This implies that the health officials, and focal needs work forward to maximize the utilization of the latrine by setting different strategies.

This study shows that the younger age of the respondent had a significant association with the utilization of latrine as compared with older age. This finding is similar to the study conducted in India [16], rural Bangladesh [17], North West Ethiopia [18] and rural communities in the District of Bahir Dar Zuria, Ethiopia [19]. This may explain that uneducated and elder people in a rural area may find it difficult to get some when latrine construction not easy to use by elders due to different reasons like privacy and cultural issues when latrine lacks door and appropriate cover. In addition to this, they are also economically dependent and they cannot afford the construction of the latrine.

This study reveals that the high education level of a mother had a significant association with latrine utilization. Similarly, a study conducted in India [17,18,20], Tigray Hawzien district, Northern Ethiopia [21], and Gedeo Zone, South Ethiopia [22]. This could be attributed to the impact of education on behavior change and the adoption of good latrine hygiene practices at the household level high among educated mothers. Furthermore, the monthly income of the household had also a significant association with latrine utilization. This result agrees with the Gulomekada District, Tigray Region, North Ethiopia [23], and Bangladesh [24]. This may due to Household's monthly income determines the availability and quality of latrine which are the important predictors of utilization of latrine. Also, this might be due to low-income households had a shortage of money to constrict latrine rather than other important materials and utilities for daily consumption.

Household family size was found to be a significant association with latrine utilization. Similarly, North West Ethiopia [20] and rural coastal Odisha, India [17]. This might be due to the presence of family and cultural practices promote small children to defecate around the house rather than go to open whole latrine use. On the other hand, this may also be related to the economic status of the household. The location of the latrine being inside the compound had also a statistically significant association with latrine utilization. This result is in line with Chencha District, Southern Ethiopia [5], and Bangladesh [26]. This may due to fear to utilize the latrine during at night and raining because it is far from the resident's house and no roof to prevent raining and it is exposed to an animal attack.

This study result shows, there was a low utilization of latrine. There is a significant number of the household still not using the latrine. The main reason was reported; the latrine is not functional, far from the house, when in the rainy season and at night without proper roof and door. This implies that a lot has to be done on awareness creation about the proper utilization of latrine and support on the maintenance of the poor family latrine that needs attention to improve rural community health. Provide different types of strategies to a rural community with an affordable cost to facilitate children's toilet training.

There might be a potential for recall and social desirability bias in the utilization of latrine and socioeconomic. In addition to this, the odds ratios of the cross-sectional study did not show the strength of an association.

CONCLUSIONS

This study result shows that the utilization of latrine needs improvements and attention to enhance the proper and adequate utilization of the latrine. It associated with being younger age, maternal education, monthly income, family size, latrine inside the compound as compared with their counterparts were found to be associated factors of the utilization of latrine. Hence, this needs to improve awareness of the community there is a need for health education programs regarding improved use of latrine, cleanliness of latrine, constructing latrine inside the compound and maintenance of latrine for the proper utilization including children should be considered. In addition to this all actors to bridge the apparent gap between knowledge and practice pertinent to upscaling latrine use. Facilitate women education, training on latrine construction skills and capacity building continuously for the community. Not only this they need support on the utilization of the matching resources to tackle the sanitation disparities while utilizing socio-culturally appropriate technological options, suitable for the study community at affordable prices.

Supplementary Materials

There is no remaining pertinent data and materials, all information is presented in the main manuscript.

Author Contributions

Conceptualization, DW; methodology, DW & YT; software, validation, and formal analysis, investigation, resources, data curation, writing-original draft preparation, writing-review and editing, visualization, supervision, project administration, DW& YT; funding acquisition, DW & YT. All authors have read and agreed to the published version of the manuscript.

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