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COLLEGE OF HEALTH SCIENCES

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ASSESSMENT OF LATRINE UTILIZATION AND ASSOCIATED FACTORS AMONG RURAL COMMUNITY MEMBERS IN DIKSIS WOREDA, WEST ARSI ZONE, ETHIOPIA

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Assessment of Latrine Utilization and Associated Factors among Rural Community Members in Diksis Woreda, West Arsi Zone, Ethiopia

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ABBREVIATIONS/ACRONYMS

AOR	Adjusted odd ratio
CLTS	Community led total sanitation
CLTSH	Community led total sanitation and Hygiene
EDHS	Ethiopian Demographic and Health Survey
FMOH	Federal Ministry of Health
HAD	Health Development armies
HEP	Health Extension program
HEW	Health Extension Workers
HMIS	Health Management Information System
JMP	Joint Monitoring Program
MDG	Millennium Development Goal
MEDHS	Mini Ethiopian Demographic Health Survey
NGOs	Non-governmental organizations
ODF	Open Defecation Free
OR	Odds Ratio
OWNP	One WASH National Program
SNNPR	Southern Nation Nationalities Regional State
SDG	Sustainable Development Goals
UNICEF	United Nations Children Fund
WASH	Water, Sanitation and Hygiene
WHO	World health Organization

ABSTRACT

Background

Sanitation is a fundamental requirement to be accessible to every individual to protect from many diarrhoeal related infections. The maximum benefit of sanitation facilities, such as latrine, is achieved if latrines are used properly. There exist many factors that challenge the use of latrines in the rural areas of Ethiopia. This master's thesis attempted to fill this gap.

Objectives: The study aimed at determining latrine utilization and associated factors among the rural community members in Diksis woreda, Arsi, Oromia region, Ethiopia.

Methods: - A community based cross-sectional study was conducted from November to December, 2020 among 591selected households with latrine facilities from 4 randomly selected Kebeles. Multistage systematic random sampling method was used. Data were collected by trained Environmental Health professionals using a pre-tested, structured questionnaire via face-to-face interviews and on-the-spot observations of the latrines. Data were entered using EpiData version 3.1 and exported to SPSS version 21.0 for data cleaning and analysis. Data were analyzed using a binary logistic regression model at 95% confidence interval (CI).From the multivariable logistic regression analysis, variables with p-value < 0.025 were taken as statistically significant and independently associated with latrine utilization. Model fitness was checked using Hosmer-Lemes how test.

Result: About 60 %(591) households surveyed had latrines functioning. The rate of latrine Utilization was 30.7% in the rural communities. using them regularly. Main reasons for non-use of latrine were latrine pit is full, slab not safe to use and lack of material to construct of the latrine. Sex of the respondent [AOR= 0.18, 95%CI, 0.18 (0.11-0.29), Educational status of wife AOR= 2.2, 95%CI, 2.2 (1.44-3.34), a school age children AOR= 1.66, 95%CI, 1.66 (1.1-2.55),), a family size, AOR= 2.1, 95%CI, 2.1 (1.36-3.16), Climate condition, OR= 0.56, 95%CI, 0.56 (0.35-0.90),were the major predictors affecting utilization of latrines.

Conclusion: The rural community of Diksis woreda's latrine status and utilization were found to be very low, indicating that more attention was needed to encourage hygiene and sanitation behavior in the community. It is suggested that an intervention be implemented to promote behavioral changes toward latrine use.

Key words: latrine utilization, sanitation, factors affecting latrine utilization

1. Introduction

1.1 Background

Sanitation is one of the basic human rights proclaimed by the United Nations, without access to it; many people are left vulnerable to health, dignity, adverse economic and educational impacts(1). Globally, around 2.3 billion people who still lacked a basic sanitation service either practice open defecation (892 million) or use unimproved facilities such as pit latrines without a slab or platform, hanging latrines or bucket latrines (856 million). The remaining 600 million use improved sanitation facilities that are shared with other households(2).

The shortages sanitation are a serious health issue that affecting billions of people around the world, especially third-world countries such as Ethiopia. The absence of latrines primarily affects poor, rural and disadvantaged populations, as the majorities (71%) of those who do not use improved latrines live in rural areas, where 90% of all open defecation takes place(3).

Today despite continued effort to improve access to safe water and sanitation, diarrheal diseases remains one of the leading causes of morbidity and mortality in the world and are responsible for the death of millions of people each year. According to the latest Global Burden of Disease Study, about 2.39 billion of diarrheal cases occurred globally and an estimated 1.31 million deaths annually (4), with higher incidence and case-fatality ratios in lower and middle income countries such as Africa and south-east Asia (5).

Diarrhea remains the second leading cause of infant mortality after pneumonia in children under the age of five (6) and is responsible for an estimated death of 0.53 million children every year (7) most deaths being occurred among children less than 2 years of age (8),(5). In African countries including Ethiopia, each child on average suffers from five episodes of diarrhea per year while the two weeks prevalence ranges from 10 to 40% in different parts of Ethiopia(6).

Sub-Saharan Africa remained the farthest behind in its progress towards accelerating access to improved latrine facilities. Regional estimates indicated that only 30% of the population in Sub Saharan Africa used improved latrine facilities and an estimated 26% practiced open defecation due to lack of latrines(9).

According to Ethiopia Demographic and Health Survey (EDHS) 2016 report national open defecation was 32.9% and more than half (56%) of rural households used unimproved toilet

facilities. The latrine facility coverage has been increasing in Ethiopia due to health extension and water, sanitation and hygiene (WASH) program started (10)

Several international organizations and NGOs have been working hard to improve the condition of Ethiopia in terms of hygiene and sanitation. It is still difficult to find a village that is absolutely free of defecation and follows good hygiene practices at all times, despite several years of effort. The study shows high differences in latrine utilization between rural and urban contexts in the country.

1.2. Statements of the problem

Adequate sanitation is the most significant factor in the field of public health accessible to the global community (11). According to the latest studies available, access to affordable drinking water and sanitation developments in Ethiopia are below the Sub-Saharan and World standards (12). As a result, it is reported that about 37% of the people, 45 percent in rural communities, and 16 percent in urban areas (more than 35 million people) actually have no access to every kind of toilet and hence exercise open defecation (13, 14).

Lack of sanitation and contaminated water and result in bacteria being spread pathogens and, to a lesser degree, in the urine (15). Insufficient sanitation and weak hygienic practices result in tremendous public health expenses and diseases (16). The sanitation problems constitute 10% of the worldwide disease threat (17). Improper handling of human body waste poses a significant public health hazard (18). Diarrhea is the second most frequent reason for the death of children below age 5, with no improvement in the past ten years (19). Those diseases are identified in the Ethiopian context by poverty and lack of knowledge of basic sanitation (20).

Diarrheal diseases are Ethiopia's first significant diseases, the main cause of death in millions primarily below 5. For example, in 2016 diarrhea was the primary factor for mortality in Ethiopia for infants below five resulting in 10 percent of all deaths (21). In Ethiopia alone, about 600 children are dying from diarrhea every day (22).Despite the efforts and commitments made at the national and international level, improved sanitation facilities coverage remains low, especially in the least developed nations including Ethiopia (23).

Therefore in order to find sustainable solutions towards mitigating the problem regarding access to and use of improved sanitation facilities and bring the desired positive outcomes, it is important to fully understand the household or individual level socio-cultural, behavioral, demographic and economic factors that are influencing the adoption and consistent use of improved sanitation facilities (24).

However sanitation coverage levels had been well studied and documented both at the national and global in the EDHS and the WHO and UNICEF Joint Monitoring Programme (JMP) reports respectively, these studies failed to assess the utilization levels and factors that associated factors. Therefore, the aim of this study was to identify the latrine usage of the household and its associated factors of rural community separately in Diksis district, oromiya region, west Ethiopia.

1.3 Rationale

Construction of sanitation facilities was widely started in all parts of Ethiopia, particularly in the rural community. This is because of Ministry of Health was started health extension program to improving sanitation facilities and utilization as one of the main components. However, the impact of latrine utilization on the health of the community, particularly in diksis woreda was not assessed

This study would inform about associated factors on latrine utilization including the above facts. It would also ensure that prevention of health problems, are not simply because of their merely physical presence of latrine, but also proper utilization especially in rural community of developing countries. This is not naturally given to the poor, but due to multiple interrelated associated factors. The problem cannot be basically reduced unless all community members utilize latrine facility properly. But the issue is on identifying those factors that make people to utilize latrine or not. Thus this study will contribute its part on identifying such factors.

1.4 Significance of the study

This study will be vital to identify level of latrine utilization and associated factors in the study area. It will provide baseline information to programmers, HCWs and HEWs to intervene for the health of the community. Thus, the findings of this study will give insight for the District Health Office and local NGOs working on sanitation activities by providing evidences in reducing open defecation through different strategies. The households in the rural communities of the district was ultimately benefit from this study. The local planners will use it for planning purpose in protecting the community health and it will also provide baseline information to other researchers.

2. Literature Review

2.1. Introduction

The promotion of sanitation facilities and behaviors can dramatically affect the number of morbidity and mortality from diarrheal (25). Various studies conducted in different countries were consistent with an association between a poor utilization of latrine and an increased risk of diarrhea, such factors include hand washing, access to latrine, family size, economy, education, number of under-five children's, latrine hygiene and the like are the factor associated with latrine utilization (18). This section provides a summary of accessible literature on the utilization, and factors associated with the utilization

2.2. Latrine utilization

Latrine utilization is defined as the regularly using of the latrine by all the family members in the households for safe disposal of excreta. For estimate latrine utilize, the presence of fresh excreta inside the pit, the presence of foot path to the latrine, and the absences of feces around the household were used (26)

As 2019 EDHS finding in SNNP, Amhara, Tigray, and Oromia was 56%, 46%, 41%, and 40%, respectively (27). Similarly, in the study done in Aneded district, the level of latrine utilization was 63% (28). Also, in the study done in Laelai Maichew Woreda, the age categories ranges from 36 to 50 years had shown significant association to the use of latrine(29).

Based on a community-based cross-sectional study conducted in South West, Ethiopia showed that from the total households, 88.2% had latrine with majority 91% pit latrine, 36% were utilized and the other 32.8% were never utilized (22). While the research conducted in Enderta district, Tigray, Ethiopia indicated that latrine availabl were 68.4%, of which 53.3% of the households were utilized their latrines (30).

Similarly study conducted among rural Community of Aneded District, North West Ethiopia revealed that all 100% of the households studied had a functional latrine, while 63.8% the latrine are utilized (24).Another paper conducted in Dilla town showed that 95% of the households have latrine, where three fourth is pit latrine and half (50.6%) of the latrines needs maintenance. Latrine utilization among the studied households is 47.3% (31).

Another cross-sectional study conducted in India the, while 61.1% of the latrines utilized. On the other hand, 39.9% of the households did not utilize their latrines at all. Among the households in which latrine is available, hand washing facility with soap was observed in 94.1% of the households(32).

A community-based cross-sectional comparative study conducted in Laelai Maichew District, North Ethiopia showed that latrine facility was available in 268% and 259.3% among households of CLTSH implementer and CLTSH non-implementers, respectively. Household utilized latrine among CLTSH implementer and CLTSH non-implementers were 54.9% and 37.8% , respectively(29).

A Study done on Latrine utilization and Associated Factors in Rural Community of Aneded District, North West Ethiopia indicates almost all households, 100% had functional latrine facility. From the total of households, 64.2% utilized latrine from one to three years, and 29% utilized more than three years ago. Nearly fifty percent, 49.8% of households had under-five children. Only 71% of children utilized latrine facility(28).

About 28.9% children who utilized latrine started at the age of three to five years. Head of households claimed that only 22% of children feces were disposed into latrine facilities by their families before self-utilization. According to this study 63.7% had utilized their latrine however only 69.2% households had continual latrine utilization(28).

The study done in 2013 on latrine utilization and associated factors in the rural Community of chencha district indicates: among 415 households, 60% use latrine in some frequency and the remaining 40% households were not using latrine. Over all consistent Latrine utilization was found to be only 31.08%. There were fresh feces at squat hole indicating the recent use of latrines in 66.78% of households with functional latrine(33)**.**

A community based cross sectional study done on level of health extension service utilization and associated factors among community in Abuna Gindeberet district, Ethiopia carried out from February to March in 2012 indicates from the total 806 Households; 36.8% of the study participants had used their latrine(34).

2.2. Type of Latrine and Status

According study done in Chencha District, Southern Ethiopia, All types of available latrines were pit latrines, 67.47% functional latrines, 46.42% required maintenance and 32.53% non-functional latrines required reconstruction(33).

Similira study condected in Wondo Genet district, South Ethiopia the majority, 92.7% of the latrine had pit slabs, among this, 65.6% of the latrine slab was made of wood with mud and 51.8% of the latrines were constructed before two years (35)and Hetosa woreda,west arsi zone ,Ethiopia the type of latrines mostly available per household found were traditional pit latrine with slab made of wood and earth 88.1% and 64.2%) were constructed within last three years and mean duration latrine 2.75 (±1.026) years.

Base on a community-based cross-sectional study conducted among rural Community of Aneded District, North West Ethiopia almost all 99.8% types of available latrines were pit latrines, 63.5% of latrines were constructed before 2 years ,86.7% latrines were functional, 54.5% latrines required maintenance and the remaining nonfunctional 13.3% latrines required rehabilitation works like superstructure and covers(28)

2.3. Hand washing practice

Hand washing is defined as the vigorous, brief rubbing together of all surfaces of lathered hands, followed by rinsing under a stream of water. Globally, basic hand hygiene is often neglected, in part due to the lack of access to hand washing facilities in key places - 40 per cent of the world's population, or 3 billion people, do not have a hand washing facility with water and soap at home.

In Ethiopia, it is estimated that 92 per cent (about 100 million) of the population lacks access to a basic hand washing facility such as water supply and soap and approximately 80 per cent of those who lack access to soap and water live in rural settings (36) .

According the study in Tigray region northern Ethiopia on hand washing practice only 5.3% of the total HHs surveyed had hand washing facility, and only one in ten, 10.7%, of the respondents practiced hand washing at critical periods (37). A similar study from rural HHs of Tanzania reported that only 13.2% of the HHs had hand washing facilities outside latrine(38) and another

study in Gedeo Zone, South Ethiopia, showed that hand washing practices at critical periods were reported to be 44.2% (39).

According study done the in Amhara Region, Ethiopia reported that 44.8% heads of households claimed to wash their hands after toilet use, and 12.9% heads of households washed their hands during at four critical times(40).

2.4. Access to Latrine

Access to latrine is measured by the percentage of the population with access and using usually ensures separation of human excreta from human contact, and using improved sanitation facilities and shared sanitation facilities (41).

About 2.5 billion people worldwide are still without access to improved sanitation. About 24% of the rural population in sub-Saharan Africa is using only improved sanitation facilities (28). The coverage of rural and urban areas is not comparable. In Ethiopia, about 60% of the population has access to sanitation facilities and 40% do not have access to improving them(42)

Ethiopia is one of the least developed countries in Sub-Saharan Africa, with very poor sanitation coverage. According to the survey, the proportion of the country's population receiving improved sanitation is 14%, with access to essential facilities and restricted services being 7% and 7%, respectively. The proportion of rural people who have access to improved sanitation facilities is 5%, with 4% and 1% having access to safe and inadequate services, respectively (23).

The 2016 EDHS findings showed that 16 percent and 4 percent of urban and rural households have access to improved sanitation services, with a national average access of 6 percent and . The proportion of rural households using shared facilities, unimproved facilities and open field defecation was 2%, 56% and 39%, respectively (43).

Over the last 10 years (2005-2016), the EDHS 2016 annual report analysis found that the proportion of households defecating in the open decreased from 62.2 percent in 2005 to 38.2 percent in 2011 to 34.3 percent in 2014 and to 32.9 percent in 2014 (44). The PMA 2017 Ethiopia study also showed that 13 percent of national enhanced sanitation coverage is, while 5 percent of rural and 39 percent of urban coverage is. In rural and urban areas, unimproved

sanitation facility coverage is 61 percent and 56 percent, respectively. Just 5% of urban residents practice open defecation and 34% of the rural population practice open defecation, the study reports (45).

The 2016 LSMS-Integrated Surveys on Agriculture Ethiopia Socioeconomic Survey (ESS) also showed that 45.2% of the rural households had access to any of improved sanitation facility, where the majorities (95.8%) of the latrines were pit latrine with slab and 2.21% households had a compost latrine. Among the rest households 1.1% and 0.89% of them had flush toilet and ventilated improved pit (VIP) latrines, respectively (46).

Government of Ethiopia had launched the National Hygiene and Environmental Health Strategy (2016-2020) in 2016, to tackle the country's sanitation crisis in line with the SDGs targets.

The primary target set under the strategy includes reaching 82% access to improved sanitation and 100% utilization of latrine by 2020. The main tool used by ministry to reach every corner of the country was Health Extension Program and Community Led Total Sanitation (CLTS) and later health development army. rural Health Extension Program consists of 16 preventive health packages of which seven which focused on environmental health activities and the ministry used this strategy as the basic tool to implement WASH program performance and improve the livelihood of population living the rural areas (47).

Oromiya is one of regional state of Ethiopia among low coverage in latrine access and utilization. As fact sheet of UNICEF and WHO 2014, estimate the status and camping the region by EDHS 2000, 2005, 2011 finding, among four big regions (SNNP, Amhara, Tigray and Oromiya) those have relatively the same geographical setting, Oromia's sanitation coverage were the least. i.e. improved and shared latrine coverage SNNP, Amhara, Tigray and Oromiya was 56%,46%,41% and 40% respectively and The coverage unimproved sanitation of the region was also 32%, 17%, 13% and 17% respectively and open defecation status was 12%, 37%, 46% and 43% respectively. From this data, we can conclude as Oromiya region lagged behind other region in sanitation access and utilization.

2.5. Sanitation policy context

The MDGs provided a blueprint for addressing the most pressing development issues of our time, with eight priorities and a set of concrete time-bound milestones with a deadline of 2015. “Halve, by 2015, the proportion of the population without sustainable access to clean drinking water and basic sanitation,” according to MDG 7c.(48).

Recognizing that Africa was not on track to attain the sanitation MDG targets, Ministers and Heads of Delegation responsible for sanitation from 32 African countries including Ethiopia came together in 2008 at the Second African Conference on Sanitation and Hygiene (AfricaSan) and signed the eThekwini Declaration with firm resolutions to: establish, review, update and adopt national sanitation and hygiene policies, place sanitation and hygiene at the top of the development agenda in Africa, improve coordination and accountability for sanitation, establish specific public sector budgets for sanitation with a minimum of 0.5% of GDP being allocated for sanitation and hygiene, promote use of effective and sustainable hygiene and sanitation approaches among others (49).

In 2015,the entire United Nations secretary general member states agreed for a global wide commitment under Agenda 2030 and had established 17 Sustainable Development Goals(SDG) with 169 global targets. The SDG 6 calls to ensure universal availability and sustainable management of water and sanitation for all by 2030. Currently, the progress related to sanitation is guided by SDGs target1.4 which aims at achieving universal access to basic sanitation services and target 6.2 which aims to achieve universal access to sanitation and hygiene and end open defecation by 2030. Safely managed sanitation services are the core indicators to monitor progress towards target 6.2 (50, 51).

Water, sanitation and hygiene (52) is at the center of this ambitious new agenda – with a distinct sector goal (SDG 6) that envisions universal, sustainable, and equitable access to safe drinking water, sanitation and hygiene, as well as the elimination of open defecation by 2030

Ethiopia is one of the member states of the SDGs signatories (47). Even though the country had achieved greatly in the reduction of the open defecation practice from 80% in 2000 to 27 in 2015, the current situation is still appalling, where 59% of the country’s households have unimproved sanitation facilities(23, 53). To avert the situation, the country has accepted the SDGs WASH goal with full government commitments to achieving the targets set by the United

Nations by 2030 via the One WASH National Program (OWNP) with the active engagement of Health Extension Program (54) and Health Development armies (HDAs) (47, 52).

The country had also launched the National Hygiene and Environmental Health Strategy (2016-2020) in 2016, to tackle the country's sanitation crisis in line with the SDGs targets. The primary targets set under the strategy includes reaching 82% access to improved sanitation and 100% utilization of latrine by 2020 (47).

2.6. Factors associated with the utilization of sanitation facility

A cross-sectional study done in 2015 on Latrine coverage and its utilization in a rural village of Eastern Nepal indicated that from the total 625 households the households having children less than 5 years were 85% less likely to use latrine than those without child (AOR 0.15, 95% CI 0.05–0.46). People from households who always clean latrine were 3.66 times [(AOR 3.66, 95% CI 1.09–12.29)] more likely to utilize latrine than those who rarely clean latrine.

Households who built latrine on self-initiation were 4.22 times more likely to use the latrine [(AOR= 4.21, 95%CI 1.06–16.66)].

Latrines constructed within 2 years 82% [(AOR =0.18, 95% CI 0.07–0.51)]Latrines needing maintenance 79% [(AOR 0.21, 95% CI 0.09–0.49)] and latrines built with any Assistance from government or NGO 67% [(AOR 0.33, 95% CI 0.13–0.80)] were less likely to be utilized. In other way, latrine height more than 1.5m nearly 13 times [(OR 12.26, 95% CI5.35–28.07)], latrines with closure for privacy nearly 22 times [(OR21.97, 95% CI 9.26–52.11)]and latrines cleaned always 3.45 times [(AOR 3.45, 95% CI 1.54–7.73)] were more likely to be utilized latrine (55).

As a Community Based Cross-Sectional Study done on Latrine utilization and associated factors in the Rural Communities of Gulukomeda District, Tigray Region, North Ethiopia, 2013 indicated that from the total 759 sample HHs those households with husbands educational status of primary and above were 3.71 times (AOR=3.71, 95%CI: 1.52-9.09) more likely utilized latrine than households with illiterate husbands.

The households with school age children, all attending the school were 4.45 times (AOR=4.45, 95%CI: 1.32-14.97) more likely to use latrine than households without school age children. Concerning to latrine type, households owned pit latrine with pit cover were 7.86 times (AOR=7.86, 95%CI: 3.61-17.10) more likely to use latrine. Regarding years of construction,

households owned latrine for more than 3 years were 3.19 times (AOR=3.19, 95 %CI: 2.04-4.98) more likely to use (56).

A community-based cross-sectional study conducted among rural communities in LemoWoreda, Southern Ethiopia showed that households who had sufficient knowledge on improved sanitation facilities were 1.6 times more likely to had improved sanitation facilities as compared to those who had insufficient knowledge on improved sanitation facilities [AOR= 1.606, 95%CI (1.022, 2.253)] and the odds of having improved sanitation facilities were 6.5 folds higher in households headed by government employers/students as compared to households headed by farmers [AOR= 6.521, 95%CI (2.216, 19.188)] (38).

Another community-based cross-sectional study conducted among rural communities in the District of Bahir Dar Zuria, Ethiopia revealed that households supervised by health professional for three times or more per month were 2 times more likely to have latrine as compared to those households not supervised at all with [AOR= 2.29, 95%CI (1.33, 3.93)](25).

A study conducted in poor peri-urban settlements of Abuja, Cot devoir showed that living in a very low socioeconomic class has 63% reduced odds on the availability of improved sanitation facilities as compared to living in middle socioeconomic class with[AOR= 0.37, 95%CI (0.17, 0.77)] (40).

A similar study conducted in rural community members in Samburu East Sub-county, Kenya also revealed that households who were subsidized were more likely to have improved sanitation facilities as compared to those who did not(4).

Base on a community-based cross-sectional study conducted among rural Community of Aneded District, North West Ethiopia revealed that the odds of utilizing latrine were 2.5 times higher in households who have children than that of who didn't have [AOR = 2.5, 95% CI (1.0, 6.5)](28).

Another community-based cross-sectional study conducted in Awabel District, Northwest Ethiopia revealed that households latrine utilization was about 4 times more likely [AOR= 4.294, 95% CI (2.625, 7.02)] among households with latrines that do not need maintenance compared with those households whose latrine which needs maintenance (44).

A community-based cross- sectional comparative study conducted in LaelaiMaichew District, North Ethiopia showed that latrines located less than ten meters were 8.5 times more likely to be

utilized as compared to those latrines located more than ten meters [AOR= 8.5, 95% CI (1.29, 56.5)](29).

A community-based cross-sectional study conducted in Indonesia showed that around 63.8%of households had low knowledge regarding the importance of latrine utilization, where 95.5% of them practice open field defecation and 73.7% of households found in middle SES utilize latrine, while only 29.7% of households in lower SES utilize their latrines(32).

2.7. Factors promoting latrine use

The published an article which stated Ownership of a latrine facility does not guarantee health benefits unless they said facility is utilized effectively. particularly for girls and women in a community where defecation during the day time is shame, it advantage of Knowledge on the danger of excreta and the perceived using latrines, were key factors that facilitated latrine use by the household members .However, many factors have been shown to promote latrine use such as behavioral, demographic, geographic, climatic and economic. Studies conducted in Tanzania and Ethiopia further indicated that socio-demographic and economic factors significantly promoted use of latrine facilities at the household level.

In addition, supportive supervisory visits to households by health personnel, presence of school going children, peer pressure, social learning and living in close proximity to a health institution have also been found to promote latrine use. However, controlling for all these factors has shown that stronger social ties have a greater influence on latrine utilization(38).

2.8. Factors hindering latrine utilization

Improving latrine utilization guarantees a wide range of benefits to a person, the household and community at large. However several obstacles remain at National level including poor national strategies and policies, insufficient funding and low prioritization of latrines by Governments. Poverty and gender inequalities could further explain the disparities in latrine use among communities with evidence suggesting that women place a higher value on private latrine facilities than men yet they have the least decision making power as well as control over household resources (49).

A study conducted in rural BechoWoreda, Ethiopia, reported that factors that hinder utilization of sanitation facilities are low income or lack of resources, age, sex of the of the household, high

cost of construction materials, soil characteristics of the area, collapse of latrines during rainy seasons, lack of space, low perception of health risk of children faeces (50).

Another study conducted in rural GenchoSisoEnseWoreda, Ethiopia stated that barriers to availability and utilization of latrine include gender, ownership of land (being tenant), bad odor/smell of latrines and population density (51).

A similar study conducted in informal settlements of Kigali, Rwanda reported that factors that hinder utilization of latrines includes; poor design of latrines (lack of doors and lighting), fear of accidents, such as falling into the pit, slipping and fall, safety and bad smell/odour of latrines, presence of flies, difficulty in obtaining permit, lack of information and lack of specialized equipment (52).

A study conducted in Nyakach; Kisumu County, Kenya found out that the main barriers to the utilization were cultural beliefs, the high cost of constructing latrine, poverty (lack of money) and soil conditions of the area (17).

2.9. Conceptual framework

For the development of the following conceptual framework, factors associated with utilization of latrine in different studies were used. It was also based on an understanding of the factors that can affect latrine utilization Distal/Basic factors (Socio-demographic factors), Intermediate/underlying factors (Environmental Factors) and proximal/immediate factors (personal factors) and Outcome variable (utilization of latrine facilities)

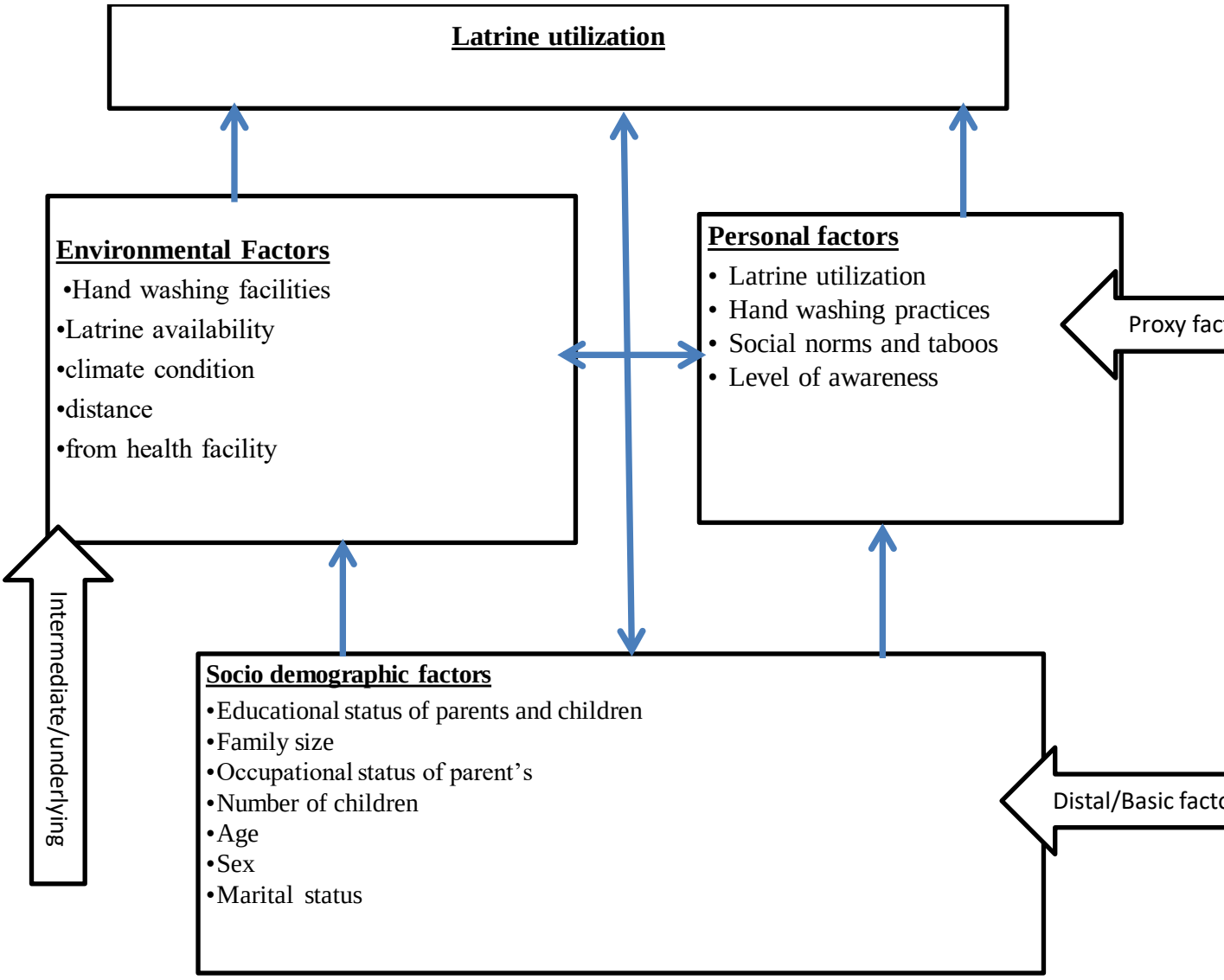


Figure 1:- Conceptual frame work for latrine utilization and associated factors among rural community members in Diksis woreda, west Arsi zone, Ethiopia 2020.

3. OBJECTIVES

3.1 General Objective

The general objective of the study was to determine latrine utilization and associated factors among the rural community members in Diksis woreda, west Arsi zone, Ethiopia.

3.2 Specific Objectives

The specific objectives were:

- To assess level of latrine utilization among households of Diksis woreda.
- To identify factors associated with latrine utilization among households of Diksis woreda.

4. METHODS

4.1. Study Area

Diksis woreda is located at 192 km west of Addis Ababa and about 102 km far from the capital city of the West Arsi zone Assela. Diksis woreda has 14 rural kebeles and 3 sub-Cities. Based on the 2018 CSA population projection this district has a total population of 1080, 419, of whom 561817(52%) are men and 518602(48%) women. In this district, the total number of households was 23,997 rural, and out of it only 4,833 households live in sub-city villages. This district was found at an altitude of 1100-2220m, humidity 22°c –35°c with landscape of 130,412 Hek. The 85% of woreda used water source from rivers and others and only 15% has served from pipe line waters and the latrine coverage of the district was (85%) in 2012 E.C. This district has one hospital and two health centers; one under construction and 15 health posts. There were 43 HEWs in the rural health posts of this woreda (Diksis woreda Health Office, 2018).

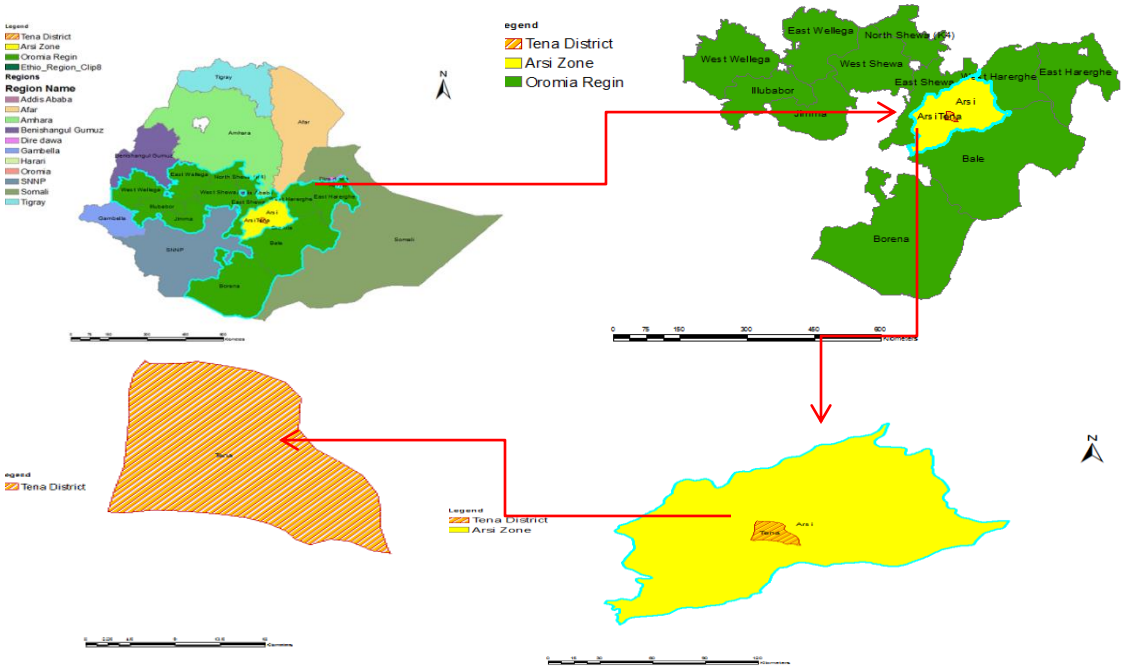


Figure 2. Maps of Diksis Woreda, Arsi, Oromia, Ethiopia, 2020

4.3. Study design

A community-based cross-sectional study design was used. The study was conducted from November, 15.2020- December 15, 2020 G.C

4.4. Populations

4.4.1. Source population

All households with larine facilities in the rural kebeles of Diksis woreda were source population.

4.4.2. Study population

Households with the latrine in the selected kebeles of the of Diksis woreda were our study populations.

4.5. Inclusion and Exclusion criteria

4.5.1. Inclusion criteria

In selected kebeles of the district, households who had functional latrine were included in the study.

4.5.2. Exclusion criteria

Household respondents those who were, not greater than six month of the study area and those who were absent during data collection after repetitive visiting were excluded from the study.

4.6. Sample size determination

For objective one the sample size was determined using single population proportion formula based on 63% latrine utilization in rural community of Aneded district (28) with 95% confidence level, 0.05 margin of error and taking 10% for non-response rate as shown below. The final sample: Where:

n= Sample size

Z= Standard Normal Deviate (1.96) which corresponds to 95% confidence interval,

p= proportion (p) of latrine utilization 63% according to the previous similar study conducted and nonresponsive rate 10%.

d= Degree of accuracy= 0.05, Design effect=1.5

$n= (Z\alpha/2)2\frac{(P(1-P)}{d2})$

n= (1.96)2$\frac{(0.63(1-0.63)}{0.052}$)

n= 358

Design effect= 1.5x 358=**537** by considering 10% for non-response rate, total sample size was **591**

For objective two: Factors associated with latrine utilization among households. The sample size formula for the method described in Kelsey. Was used: When difference in proportions (for binary exposure): The sample size calculation was based on the following assumptions: P1 and P2 are the prevalence of latrine in utilization and non-utilization populations, respectively. From a similar study conducted in Chencha District(33), Southern Ethiopia.

$n1 = \frac{(\frac{Z\alpha}{2}+Z1-\beta)2p'q'(r+1)}{r(p1+p2)^2}$ And n2= rn1

n1=number of exposed

n2= number of unexposed

Zα/2=standard normal deviate for two-tailed test based on alpha level (relates to the confidence Interval level)

Z β =standard normal deviate for one-tailed test based on beta level (relates to the power level)

r = ratio of unexposed to exposed

p1 = proportion of exposed with disease and q1 = 1-p1

p2 = proportion of unexposed with disease and q2 = 1-p2

P'=$\frac{p1+rp2}{r+1}$ and q'=1-p' and to detect an odd ratio (OR) of 1.99 or greater for 80% power and 1.96 level of significance.

Let r=1 i.e. equal number of exposed and non-exposed. Consider the proportion exposed in the control group is 30%, to get proportion of cases exposed, than

P non exposed = $\frac{oRXP\ exposed}{1+(oR-1)pexposed}$=$\frac{1.99x0.30}{1+(1.99-1)0.30)}$=0.597/1.297=0.46

Average proportion exposed= 0.46+0.30/2=0. 38 where P'= (p1+rp2)/(r+1)

n=$\frac{p'(1-p')(\ Z\alpha/2+\ Z\ \beta)\text{^}2}{E^2}${r+1|r}=where E=P 1 -P 2 and r is ratio of exposed to non-exposed.

$\frac{[(0.35)(1-0.35)(1.96+0.84)]\text{^}2\{1+1/1}{(0.46-0.30)^2}$= $\frac{3.5672}{0.0256}$= 139

n = 139, so 139for exposed and 139 for non-exposed .Sample size for this study is 278. Based on the above sample size calculations taking the largest sample size 537 by adding 10% Non-response rate 591 HHs will be used for the study, the final sample is 591.

4.7. Sampling procedures (techniques)

There were 14 rural kebeles in Diksis woreda. All Kebeles in the woreda were considered in the sampling process for the selection of the study participants. Using simple random sampling technique four kebeles were selected by using lottery method. The total sample size was distributed within all selected kebeles proportionate to the total number of households found in each kebeles.

Four kebeles from the woreda were selected by considering 7103 households registration numbers from the health extension registration book as a sampling frame. Systematic random sampling technique was employed to select households from selected kebeles. Once the study kebeles were identified, 591 households with latrines were selected by using proportional allocation to size. The study household with latrine were selected every (12th) household intervals, by dividing the total number of households with latrines to the allocated sample size. The first household was selected randomly. The household head or the house mother (if the mother not available) of the households resident of greater than six month of the study area were considered as respondent.

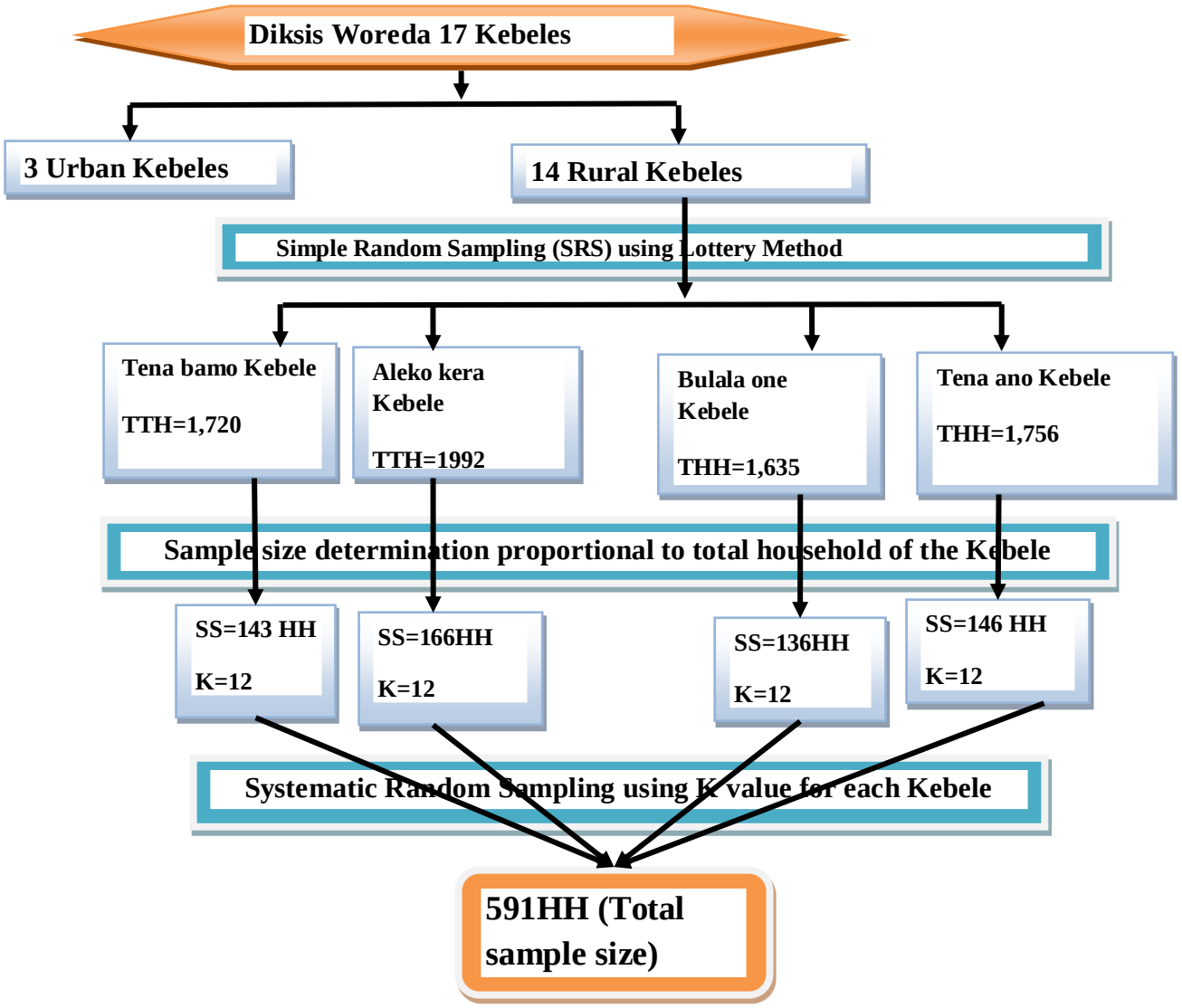


Figure 3: Schematic presentation of sampling procedure for research studies on latrine utilization and associated factors in the rural communities of Diksis woreda, West Arsi Zone, OromiaRegional State, Ethiopia

4.8. Data collection Methods

The questionnaire was adopted from different related literatures. The instrument was first prepared in English and then translated in to the local language Afan Oromo; and it was again translated back to English to maintain its consistency in translation. Data was collected by interviewing the household head or the house mother (if the mother not available) of the households resident of greater than six month of the study area was considered as respondent; by using structured Afan Oromo interview questionnaires.

During screening of households with latrine, health extension workers were involved. Initially 5% of sample size households were for pre-test and then study subjects were interviewed by one supervisor who were BSC degree holder environmental health and four degree completed data collectors with previous experience of data collection and fluent speaker of the local language were recruited.

Heads of households who were considered as such by the members of the households were selected for interview. Face to face interview with individual respondents was carried out to assess whether all family members use or not use latrine and if use whether consistently or non-consistently and how they dispose excreta of under five children. In addition observation checklist was used for indicators of latrine utilization such as fresh feces around squat hole, footpaths to latrine; and observed feces and urine smell in the compound.

4.9 Study Variables

4.9.1 Dependent variable

Latrine utilization

4.9.2. Independent variables

Socio-demographic related factors: Age, sex, educational level, marital status, and occupation of the household head, Number of household occupants of the household.

Environmental factors: Hygiene, Housing, Latrine, Climate and Soil type

Institutional factors: -Supervision of HEW**,** Presence/implementation of Intervention program, Latrine sanctions/law enforcement, Possession of latrine construction skills, Availability of latrine construction materials and Strong social support

Behavioral and Psychosocial Factors: - Social norms and taboos, Perceptions, Attitude & Beliefs **and** Level of awareness /Knowledge

Conditions of the latrine factors:-Latrines closure for privacy, Cleanliness of the latrine, Latrines need of maintenance, Latrine covers on the squatting hole and Latrine distance from the home.

4.10. Operational definitions

Latrine utilization: Determined using "signs of use" such as a household having a functional latrine, children's faeces being safely disposed of, no observable faeces in the compound and at least one observable sign of use (e.g., foot path to the latrine not covered by grass, latrine odor, lack of spider web in squatting hole, presence of anal cleansing material, fresh faeces in the squatting hole (trap), or a wet slab) (33).

Head of household: The husband, wife or adult family member residing permanently in the household who are greater than 18 years of age and have the higher responsibility for the household.

Functional latrine: is a latrine that provided services at the time of data collection even if the latrine required maintenance (53)

Clean latrine: No faecal matter in and around the pit latrine, properly swept**.**

Dirty latrine: Faecal matter littered in or around the pit latrine not swept.

Consistent latrine use: Was assumed when all family members used the latrines as reported by the respondents, and no faeces were observed to be present in the vicinity.

Latrine with maintenance: latrine with damaged slab or super structure.

Shared Latrine means latrines which are used by more than one household

4.11. Data quality management

The data was collected by four university degree completed data collectors with previous experience of data collection and fluent speaker of the local language after having two days of training. The training mainly focused on how to interview questions and fill the questionnaires, neutrality of interviewers, responsibilities of data collector, and rights of respondents. From rural kebele of Diksis woreda in Jawi kebeles which was not selected for the study pre-test on 5% of the sample was conducted to know the length, content, question wording and language understandability of the question before two weeks of the actual data collection time. All the questionnaires were checked daily to ensure that whether they are appropriately filled. Any

missing data was confirmed before the start of the next day's interviews. Double data entry for 20% of the questionnaire was performed to see consistency in data entry and separately entered data was checked to correct mismatches. In addition quality of data collection was ensured through close supervision of the data collectors by the principal investigator.

After the completion of data collection process, all the questionnaires were checked for completeness, clarity and consistency. The data was entered and cleaned using Epi Data version 3.02 and was exported in to SPSS Version 21 statistical software for data processing

4.13. Data analysis

Objective One: -Data were double entered in to SPSS software version 21, cleaned and analyzed. Frequency distribution and percentages were calculated as appropriate and displayed using tables and figures.

Objective Two: - Crude odds ratio along with 95% CI were used to assess the presence of association between independent and dependent variables. Then those variables which had P-value ≤ 0.25 were considered as candidate variable for the final model. Multi-co linearity was checked to see the linear correlation among the independent variables by using standard error of >2 were dropped from the multi-variable analysis. The fitness of the model was tested by Hosmer-Lemes how's goodness-of-fit test model and the coefficient was found to be insignificant with a large p-value (P=0.940) and the omnibus tests was significant (P=0.000).

Finally multivariate logistic regression was used to control the effect of confounding variables and to determine the predictors of the outcome. Accordingly, the adjusted odds ratio and its 95%confidence level were reported.

4.14. Ethical consideration

The research topic and methodology was approved by the Institutional Health Research Ethics Review Committee of Addis Ababa University College of Health Sciences. Permission to conduct the study was also obtained from Diksis woreda health office and from the local kebeles also. Informed written consent was obtained from respondents after explaining the objective of the study. Participants were assured of confidentiality with regard to all information acquired. In addition withdraw from the study during the interview were guaranteed to all the study participants at any time.

5. Results

5.1. Socio-demographic characteristics of respondents

A total of 591 households who have a private latrine were included in the study with a response rate of 98.65%. Among the respondents 393 (67.4%) were females and the majority 327(56.1%) of the households were 18-40years of the household head age. Three hundred seventy six (64.5%) of the household's head was married.

Concerning educational status, 237(40.7%) of the household's head were illiterate and two hundred ninety nine (51.3 %) of the wives of were illiterate. Almost 521(89.4 %) and 484 (83.00%) of the household's head and wives were farmers, respectively. The majority (95.4 %) of the household heads was from Oromo ethnic group and two hundred ninety four of the household heads were followers of orthodox religion.

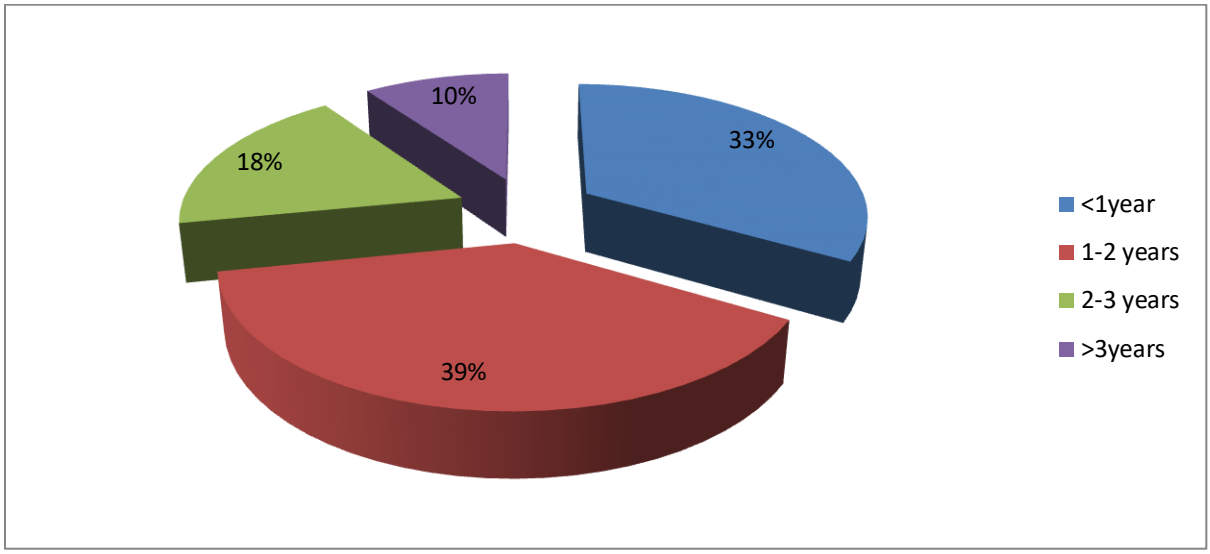
Among the households, 290(49.7%) had children under five years old and usage of latrine by family members size below age of 5 was found to be 69.00% and the presence of primary or secondary school student in household was account 156(26.8%). Among the climate condition of the woreda was 383(65.7%) was account highland/dega (Table 1).

Table 1: Distribution of respondents by socio-economic characteristics in rural community of Diksis Woreda, March, 2021 (n=583)

Variables	Frequency	Percent
Sex of the respondent		
Male	190	32.6
Female	393	67.4
Age of household head		
18-40 years	327	56.1
41-80 years	233	40
81years	23	3.9
Marital status of the household head		
Single	207	35.5
Married	376	64.5
Educational status of the household head		
Illiterate	237	40.7
1-8 grade	307	52.7
9-12 grade	27	4.6
12 grade	12	2.1
Main occupation of the husband		
Farmer	521	89.4
Govt office	38	6.5
Private	24	4.1
Main occupation of wife		
Farmer	484	83
Govt office	46	7.9
Private	53	9.1
Ethnicity of the household head		
Oromo		
Amhara	556	95.4
	27	4.6
Religion		
Orthodox	293	50.3
Muslim	290	49.7
Presence of under five children		
Yes	177	30.4
No	406	69.6
Family size		
5 persons	299	51.3
>5 persons	284	48.7
Presence of primary or secondary school student in HHS		
Yes	156	26.8
No	427	73.2
climate condition		
highland/dega	383	65.7
Temperate	200	34.3

In term of source of information, of the respondents about 56(35%) of them had only heard from HEWs and radio 50(31%). About 133(39%) of the household of the respondents were the latrine given services of 1-2year and less than one years115 (33%). Type of latrines mostly available per household found were traditional pit latrine with slab made of wood and earth cover 547(94%) and Traditional pit latrine with cemented slab or stone slab 36(6%) in woreda (Figure 4, 5, 6)

Figure 4: Services given of latrine at household in rural community of Diksis Woreda, March, 2021 (n=583)



The total households latrine, 222(38.1%) were found accessible to all family members belongs that household. Among total of observed latrines, 385(66%) in had good wall for privacy, 346(59.3%) in had roof that prevent rain and sun light and only 67(11.5%) ' had vent pipes for ventilation. Among all functional latrines observed in this study 479(82.2%) in had well-constructed slab. On the other hand, among observed latrines 213(36.5%) had washable slab. Most of observed latrines during data collection, 151 (25.9%) in had floor which was easily cleanable but only 176(30.2%) household latrines' floor were found clean (hygienic). Also, 156(26.8 %) in had only one squat hole and 166 (28.5 %) in latrines had squat hole covers. Among observed functional latrines, 57(9.8%) had hand washing facility near to latrine and 49(8.4%) Hand washing give service had soap or substitute near the hand washing facility. On the other hand among available hand washing facility near to latrines account 526 (90.2 %) had no Hand washing with water (Table 2)

Table 2: Distribution of respondents by Latrine characteristics in rural community of Diksis Woreda, March, 2021(n=583)

Variables	Frequency	Percent
Latrine with a wall for privacy		
Yes	385	66
No	198	34
Latrine with roof		
Yes	346	59.3
No	237	40.7
Latrine with slab		
Yes	479	82.2
No	104	17.8
Latrine with a washable floor		
Yes	13	36.5
No	370	63.5
Latrine with easily cleanable floor		
Yes	151	25.9
No	432	74.1
Latrine with vent pipe		
Yes	67	11.5
No	516	88.5
Latrine with only one squat hole per latrine room		
Yes	156	26.8
No	427	73.2
Latrine with squat hole cover		
Yes	166	28.5
No	417	71.5
Latrine with hand washing facility		
Yes	57	9.8
No	526	90.2
Hand washing with water Yes	57	9.8
No	526	90.2
Soap/substitute available with hand washing facility		
Yes	82	14.1
No	501	85.9
Hand washing give service		
Yes	49	8.4
No	534	91.6

In terms of the total number of latrines in a household, 179(30.7%) were identified as fully utilized at time of data collection. Among all latrines observed in this study 156(26.8%) in households had fresh foot path leading to the latrine and observed latrines 299(51.3%) at households had splash water/ Urine on the latrine floor.

During data collection, the majority of latrines were observed, 347 (59.5%) in households had available which was functional but only 213(36.5%) household latrines' Observe a human feces in the compound. Also, 212(36.4%) of the households were fly observed in the latrine and 127(21.8%) had only feces observed inside latrine (Table3).

Table 3: The Extent of latrine utilization based on observational checklist in rural community of Diksis Woreda, March, 2021(n=583)

Variables	Frequency	Percent
Is there fresh foot path leading to the latrine		
Yes	256	43.9
No	327	56.1
Is there splash water/ Urine on latrine floor		
Yes	299	51.3
No	284	48.7
Is there feces observed inside latrine		
Yes	127	21.8
No	456	78.2
Is there fly observed in the latrine		
Yes	212	36.4
No	371	63.6
Observe a human feces in the compound		
Yes	213	36.5
No	370	63.5
Functionality of available latrine		
Functional	347	59.5
Non Functional	236	40.5
Does All HH member Utilize latrine		
Yes	179	30.7
No	164	28.1
Does the latrine affected by disaster before by wind and flood		
Yes	312	53.5
No	271	46.5

Out of the 583 households interviewed that had latrines, 179 (30.7%) in woreda were responded as using them regularly. Among the respondents who claimed that they did not use the latrine were those who stated that they did not have a reason to do so that, Due to no money to maintain 67(11.5%) latrine pit full 33(5.7%) and No material to construct used to maintain 30(5.1%). Among HH the possible reasons didn't usually utilize latrine was the Latrine pit is full 46(7.9%) and the slab is not safe to use 43 (7.4%)

Adult men and adult women were listed as the main users of latrines in households where all family members did not use them. In the woreda, however, it was recorded that children and everyone in the household did not use the latrine much more. The 133 (39%) of household head respondents have had their own latrine facility for 1-2 years.

Among households Baby's feces usually disposed 139 (48%) put into drain/ditch, 67(23%) Left open (Figure 5, 6, 7, 8)

Figure 5: Reason for not always utilizing latrine in rural community of Diksis Woreda, March, 2021 (n=165)

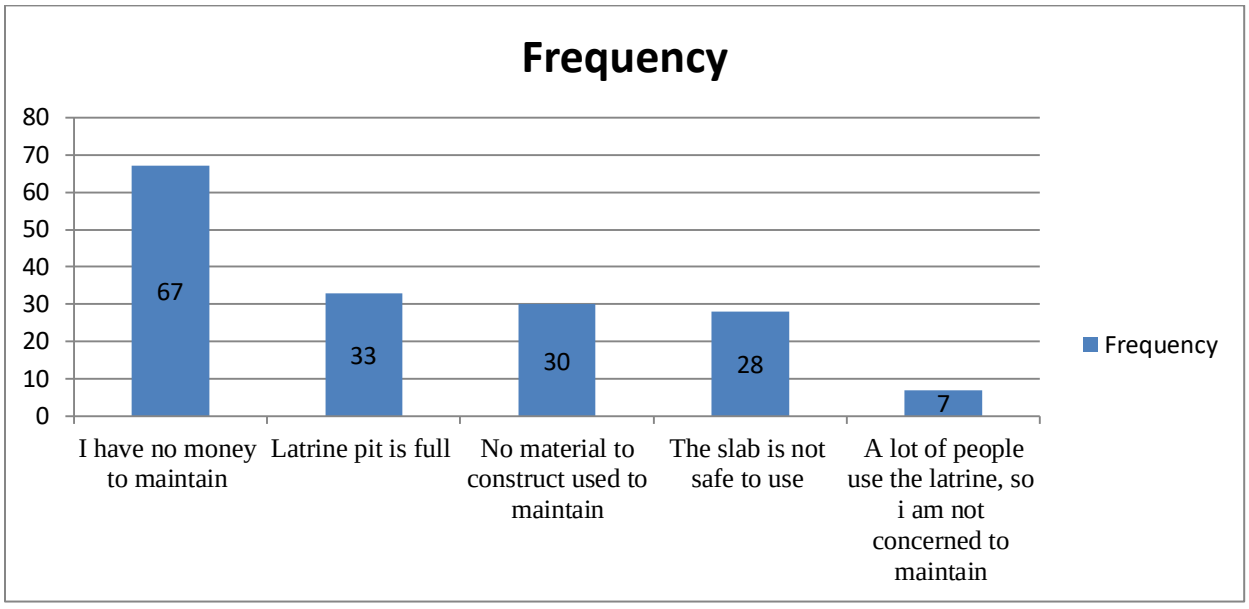


Figure 6: Reasons for non-functionality of the latrine in rural community of Diksis Woreda, March, 2021 (n=165)

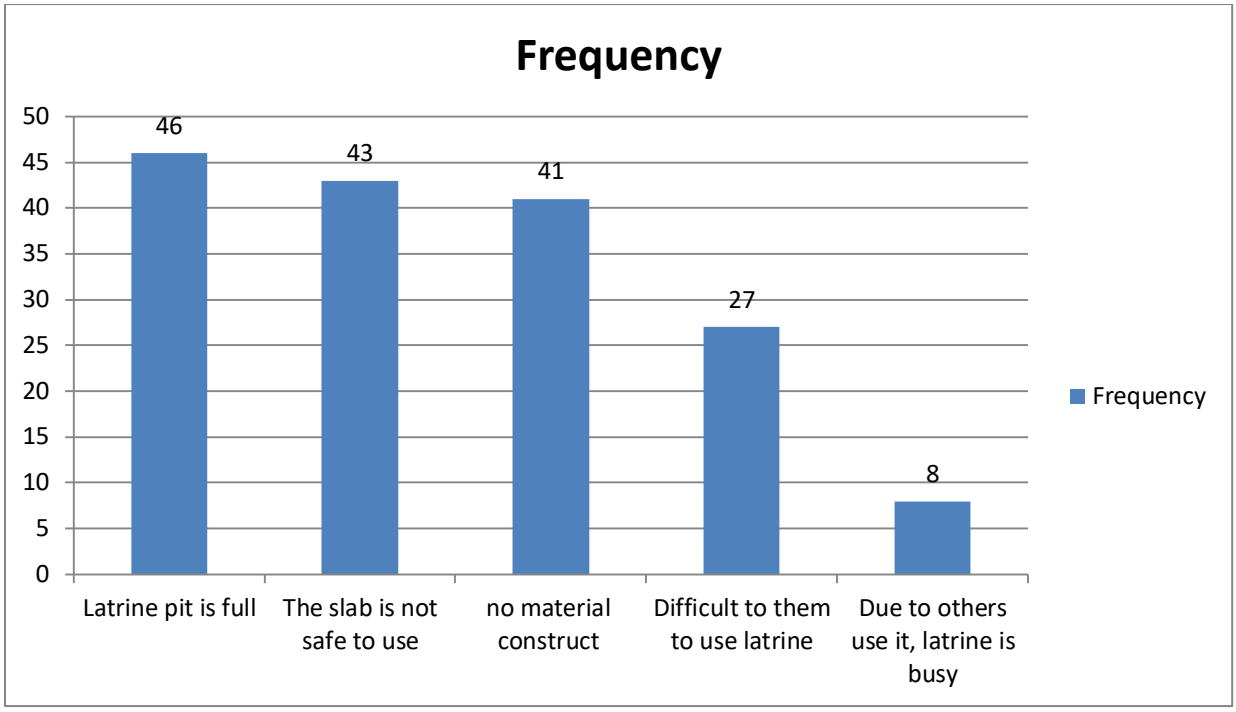


Figure 7: Households the possible reasons didn't usually utilize latrine in rural community of Diksis Woreda, March, 2021(n=165)

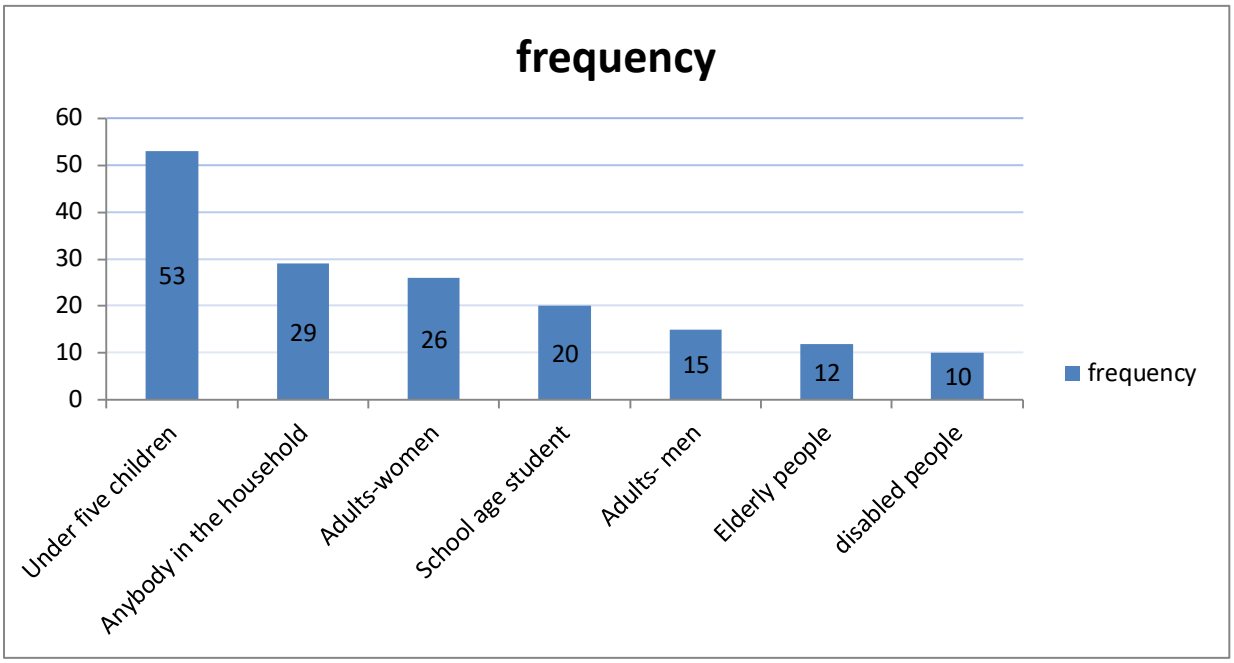
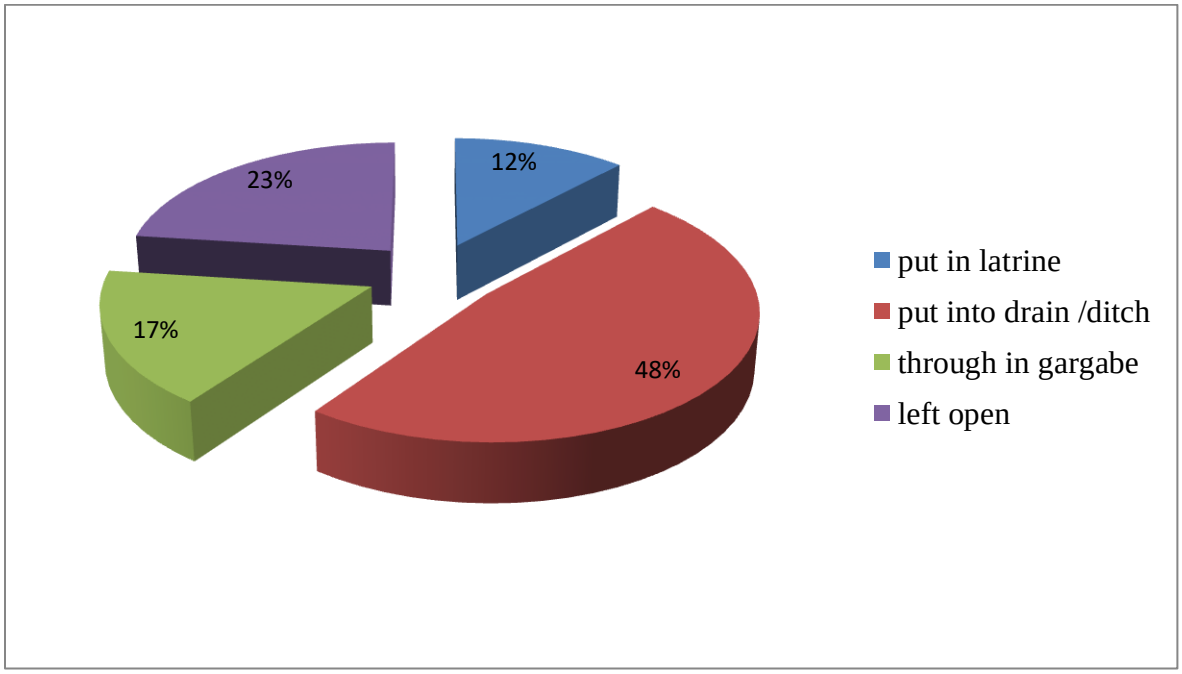


Figure 8: Baby's feces usually disposed in rural community of Diksis Woreda, March, 2021(n=583)



A. Bivariate analysis

Bivariate analysis was carried out to examine the associated factors for latrine utilization at the household level. Many variables were explored to test association of adjustment of variables using logistic regression was carried out to predict variables that were associated with latrine utilization during the crude analysis.

According, to the bivariate result of this study the socio demographic variable such as sex of head of household, Education of mother and climate condition in the household showed statistically significant association to latrine utilization. From the bi-variable analysis of socio-demographic factors, the odds of latrine utilization among households that had an age category of households of 41-80 years were 0.64 times [OR: 0.08, 95% CI (0.03-0.20)] higher than among households that had an age of households of less than it.

Sex of respondents of household head showed significant association with latrine utilization, where those households headed by males were 1.36 times more likely to latrine utilization than that of females headed households [COR= 0.20, 95%CI (0.13-0.33)].

Education of respondent showed significant association with latrine utilization, where those education mother illiterate 2.6 more likely utilization than that of literate mother [COR: 2.60, 95% CI (2.00-3.68)] were among socio-demographic factors showed statistically significant association with latrine utilization. Households in the orthodox religion were 1.50 times more likely to utilization the latrine as compared to the households in the orthodox religion [COR= 1.50, 95%CI (1.07 - 2.08)].

Climate condition of household showed significant association latrine utilization, where those households in highland/Dega were 0.32 times more likely to have utilized than temperate of climate condition [COR= 0.32, 95%CI (0.22-0.46)]. we found that the odds of a Latrine with squat hole cover being utilized was 2.25 times [COR: 2.25, 95% CI (1.54-3.27)] higher than a Latrine without squat hole cover s, household those latrine accessible to all were 0.49 times [COR: 0.49, 95% CI (0.34-0.72)] higher than not latrine accessible all, latrine with hand washing facility 2.21 times [COR: 2.21, 95% CI (1.43-3.43)] higher than not have it, and latrine with hand washing give service 3.17 time (COR: 3.17, 95% CI (1.94-5.17)] were showed statistically significant association with latrine utilization (Table 4,5).

Table 4: Socio demographic bi-vairiate regression analysis of predictors of latrine utilization in rural community of Diksis Woreda, March, 2021(n=583)

Variables	Latrine Utilization		COR (95%CI)	P-Value
	Yes (n=402)	No(n=181)		
Sex of the respondent				
Male	167	23	0.20 (0.13-0.33)	0.001*
Female	235	158	1.00	
Age of household head				
18-40 years	186	141	0.49 (0.20-1.16)	0.104
41-80 years	207	26	0.08 (0.03-0.20)	0.001*
81years	9	14	1.00	
Marital status of the household head				
Single	131	72	1.4 (0.95-1.96)	0.428
Married	271	109	1.00	
Educational status of the household head				
Illiterate	179	58	0.59 (0.41-0.85)	0.48
Literate	223	123	1.00	
Main occupation of households				
Farmer	212	309	1.00	
Govt Office	26	36	0.95 (0.56 -1.62)	0.851
Educational status of wife				
Illiterate	121	95	2.60 (2.00-3.68)	0.001*
Literate	281	86	1.00	
Religion of the household head				
Orthodox	225	69	0.47 (0.33-0.67)	0.032
Muslim	171	112	1.00	
Presence of under five children				
Yes	92	63	2.00 (1.23-2.64)	0.001*
No	310	118	1.00	
The school age children of any age attending formal education				
Yes	96	60	1.58 (1.08-2.32)	0.002*
No	306	121	1.00	
Family size				
≤ 5 Persons	188	107	1.64 (1.12-2.35)	0.006*
>5 Persons	214	74	1.00	
Climate condition				
Highland/Dega	297	86	0.32 (0.22-0.46)	0.001*
Temperate	105	95	1.00	

Ref, Reference category *Variables from bivariate analysis of p-value < 0.025 considered for multivariable analysis

Table 5: Latrine characteristics bivariate analysis of latrine utilization in rural community of Diksis woreda in, March, 2021 (n=583).

Variables	latrine utilization			
	Yes(n=402)	No(n=181)	COR (95%CI)	P-Value
Latrine accessible to all				
Yes	173	49	0.49 (0.34-0.72)	0.001*
No	229	132	1.00	
Latrine with wall for privacy				
Yes	283	102	1.09 (0.77 - 1.55)	0.001*
No	119	79	1.00	
Latrine with roof				
Yes	242	104	0.89 (0.63 -1.28)	0.533
No	160	77	1.00	
Latrine with slab				
Yes	322	157	0.62 (0.38-1.01)	0.054
No	80	24	1.00	
Latrine with washable floor				
Yes	144	69	1.20(0.85 - 1.69)	0.594
No	258	112	1.00	
Latrine with easily cleanable floor				
Yes	107	44	0.89 (0.59-1.33)	0.556
No	295	137	1.00	
Latrine with vent pipe				
Yes	44	23	1.37 (0.80 - 2.33)	0.537
No	358	158	1.00	
Latrine with only one squat hole per latrine room				
Yes	100	56	1.35 (1.01-2.00)	0.127
No	302	125	1.00	
Latrine with squat hole cover				
Yes	93	73	2.25 (1.54-3.27)	0.001*
No	309	108	1.00	
Latrine with hand washing facility				
Yes	55	47	2.21 (1.43-3.43)	0.001*
No	347	134	1.00	
Hand washing with water				
Yes	40	17	0.94 (0.52-1.70)	0.834
No	362	164	1.00	
Soap/s substitute available with hand washing				
Yes	65	55	2.26 (1.50-3.42)	0.001*
No	337	126	1.00	
Hand washing give service				
Yes	35	42	3.17 (1.94-5.17)	0.001*
No	367	139	1.00	
reward or punishment in the community				
Yes	153	6	0.06(0.02-0.13)	0.001*
No	249	175	1.00	

Ref, Ref cate *Variables from bivariate analysis of p-value < 0.025 considered for multivariable analysis

Respondents who have functional available latrine utilization latrine had 0.04 higher odds of latrine utilization as compared to those didn't functional [COR=0.04, 95%CI (0.02-0.07)]. Similarly, respondents who there not splash water/urine on latrine floor had 0.65 higher odds of latrine utilization than those who had there fresh foot path leading to the latrine [COR= 0.65, 95%CI (0.32 - 1.32)]. Households who latrine not affected by disaster before Utilize latrine were 0.34 times likely to utilization latrine as compared to those who latrine affected by disaster before Utilize latrine [COR= 0.34, 95%CI (0.24-0.49)] (Table 6)

Table 5: The Extent and Bi-viariate regression analysis of latrine utilization based on observational check list in Rural Community of Diksis Woreda, March, 2021 (n=583)

Variables	latrine utilization		COR (95% CI)	p-value
	Yes(n=402)	No(n=181)		
Is there fresh foot path leading to the latrine				
Yes	31	18	1.32 (0.72-2.43)	0.37
No	371	163	1.00	
Is there splash water/ Urine on latrine floor				
Yes	29	9	0.65 (0.32 - 1.32)	0.313
No	373	172	1.00	
Is there feces observed inside latrine				
Yes	98	29	0.59 (0.37-0.94)	0.025*
No	304	152	1.00	
Is there fly observed in the latrine				
Yes	146	66	1.01 (0.70-1.45)	0.973
No	256	115	1.00	
Functionality of available latrine				
Functional	322	25	0.04 (0.02-0.07)	0.001*
Non Functional	80	156	1.00	
Does the latrine affected by disaster before				
Yes	248	64	0.34 (0.24-0.49)	0.001*
no	154	117	1.00	

Ref, Reference category *Variables from bivariate analysis of p-value < 0.025 considered for multivariable analysis

B. Multivariate analysis

In order to identify significantly variable that were associated with the outcome variable all significant variable with P-value <0.025 were further analyzed in the multivariate analysis to identify their related effects with latrine utilization.

From socio demographic factors the model showed that school age children (AOR: 1.66, 95%CI (1.1-2.55)], and sex of household heads (AOR: 0.18, 95%CI (0.11-0.29)], and Educational status of wife (AOR: 2.2, 95%CI (1.44-3.34)].The household with religion 0.69 times more likely to utilize latrine than household with orthodox religion.

Among the Environmental factors that showed significant association with satisfaction of latrine utilization on bivariate analysis, the Climate condition (Household found highland/Dega) [AOR: 0.56, 95%CI (0.35-0.90)]. Households at highland/Dega climate condition were 0.56 times more likely satisfactorily utilize latrine than temperate condition. Latrine not affected by disaster of household from were more likely utilized than latrine affected by disaster [AOR: 0.24, 95%CI (0.14-0.40)] also showed significant association with latrine utilization.

Respondents who have functional available latrine utilization latrine had 0.03 higher odds of latrine utilization as compared to those didn't functional [AOR=0.03, 95%CI (0.02-.05)]. Similarly, respondents who there not splash water/urine on latrine floor had 6.75 higher odds of latrine utilization than those who had there fresh foot path leading to the latrine [AOR= 6.75, 95%CI (2.1-22.2)]. Households who latrine feces observed inside latrine were 0.35 times likely to utilization latrine as compared to those who not observed feces observed inside latrine Utilize latrine [AOR= 0.35, 95%CI (0.15-0.79)] (Table 7,8).

Table 6: Socio demographic-multi-viariate regression analysis of predictors of latrine utilization in rural community of Diksis Woreda, March, 2021 (n=583)

Variables	Latrine Utilization		AOR (95%CI)	P-Value
	Yes (n=402)	No(n=181)		
Sex of the respondent				
Male	167	23	0.18 (0.11-0.29)	0.001*
Female	235	158	1.00	
Age of household head				
18-40 years	186	141	0.34 (0.13-0.89)	0.027
41-80 years	207	26	0.12 (0.04-0.33)	0.001*
81years	9	14	1.00	
Educational status of wife				
Illiterate	121	95	2.2 (1.44-3.34)	0.001*
Literate	281	86	1.00	
Presence of under five children				
Yes	92	63	1.05 (0.66-1.653)	0.84
No	310	118	1.00	
The school age children				
Yes	96	60	1.66 (1.1-2.55)	0.019*
No	306	121	1.00	
Family size				
5 Persons	188	107	2.1 (1.36-3.16)	0.001*
>5 Persons	214	74	1.00	
Climate condition				
Highland/Dega	297	86	0.56 (0.35-0.90)	0.016*
Temperate	105	95	1.00	

Ref, Reference category *Variables from bivariate analysis of p-value < 0.025 considered for multivariable analysis

Table 7: The Extent multi-viariate regression analysis of latrine utilization based on observational check list in Rural Community of Diksis Woreda, March, 2021 (n=583)

Variables	latrine utilization			
	Yes(n=402)	No(n=181)	AOR (95% CI)	p-value
Is there fresh foot path leading to the latrine				
Yes	31	18	6.75 (2.1-22.2)	0.002*
No	371	163	1.00	
Is there splash water/ Urine on latrine floor				
Yes	29	9	0.38 (0.14-1.08)	0.068
No	373	172	100	
Is there feces observed inside latrine				
Yes	98	29	0.35 (0.15-0.79)	0.011*
No	304	152	1.00	
Is there fly observed in the latrine				
Yes	146	66	1.00 (0.58-1.73)	0.987
No	256	115	1.00	
Functionality of available latrine				
Functional	322	25	0.03 (0.02-.05)	0.001*
Non Functional	80	156	1.00	
Does the latrine affected by disaster before				
Yes	248	64	0.24 (0.14-0.40)	0.001*
no	154	117	1.00	

Ref, Reference category *Variables from bivariate analysis of p-value < 0.025 considered for multivariable analysis

Discussion

The current study's main objective was to determine the level of latrine utilization and associated factors among households in Diksis District, West Ethiopia.

In the current report, about 40.5% of households were correctly using their latrines. The findings were consistent with those of other districts in the area and that the utilization of latrines was significantly associated with the household head's climate condition, community reward or punishment, fresh footpath leading to the latrine, hand washing service, latrine affected by disaster before, latrine with roof, latrine with slab, latrine with easily cleanable floor and occupational service.

Our finding showed that, latrine utilization was 30.7%. The latrine utilization rate was lower than that found in the study in Bahir Dar Zuria District (62%) (25),Hulet Ejju Enessie District (61%) (57),Wondo Genet (56%) (35), Gulomekada district (57.3%) (56) and Chencha (60%)(33) But line found in various other rural areas of a report from Mtwara Rural District of Tanzania (40.0%) (38) and higher than east zone Tigry region (37.6%) (30).

The fact that residents of this Diksis woreda area were less aware of latrine utilization, sanitation and hygiene practices, educational opportunities, and the presence of government employees in the woreda had almost no positive impact on latrine utilization and explained may explain the relatively lower prevalence of latrine utilization in our study compared to the rural areas described.

In this report, the majority of households (59.5%) had a latrine latrine functional. Financial difficulties, a lack of sufficient space, unsuitable land for construction, and a lack of building materials were all cited as reasons for not always using the latrine. The majority of the participants (93.8%) used traditional pit latrines, while the remainder (7.2%) used other forms of latrines.

Out of the 583 households interviewed that had latrines, 238(40.8%) in woreda were responded as using them consistently. Consistent use was assumed when all family members used the latrines as reported by the respondents, and no faeces were observed to be present in the vicinity. The consistent use of latrines in this study was lower than that of Tigray in northern

Ethiopia(56).The variations might be due to different demographic characteristics, their perceptions and economic status of the two groups.

Even though literate mothers were less likely to increase latrine usage than illiterate mothers, (2.60, 95% CI, (2.00-3.68)) there was no correlation between literacy and latrine utilization. This may be because there was no sanitation and hygiene education program in combination with the construction of latrine facilities, or because even if there was, mothers who spend the majority of their time in the vicinity of the house and are also responsible for the care of their child were not given special attention.

Our study showed that 37.4% of households visited health extension workers (HEWs) for a hold-up visit contributed to latrine utilization and that 27.3% of households have seen/heard any promotion of latrine utilization in the last six months. This finding was lower than the study carried out in the South East zone of Tigray, Ethiopia (93.2%)(30) by HEWs and Bahirdar zuria, Ethiopia, (25) the variation due to topography of the study area is not suitable and the settlement of the community is disperse each other.

Regarding Educational status of the participants, educational status of household [COR= 1.34, 95%CI (0.68 -2.66)] were significantly associated with latrine utilization. This finding may be clarified by the fact that education enables a literate household head to obtain knowledge from a wider variety of sources than an illiterate household head on the topic of latrine utilization.

Regarding hand washing facility, those who have hand washing facility [AOR: 1.5, 95% CI (1.0 -2.23)] were found to be significantly associated with latrine utilization.

Just 9.8% of latrines have hand washing facilities near the toilet. This is in line with Kersa's (8.3%) findings and higher than a study conducted in Baher Dar Zuria (6.2%) (25), This difference may be due to the fact that recently there has been high mobilization of the community on hygiene and sanitation which increases hand washing facility prevention of covid-19 of the study area.

But this study result was lower than Hulet Ejju Enessie (30.8%) (57) this could be due to a gap in commitment in mobilizing the population to use hand washing facilities, which could be partly

attributed to a lack of water and soap, as well as a lack of knowledge about the value of hand washing after visiting the toilet in preventing feco-oral disease transmission.

In this finding about 133(39%) of the household of the respondents were latrine constructed or duration 1-2 year of the latrine was shown to have association with utilization. This was also seen in a similar study in Hullet eju Enessie (57), Aneded district (28), Dilla town, Chencha (33) and in Wondo Genet(35).

This could be explained by differences in study design as well as socioeconomic and cultural differences among study participants, or it could be due to the fact that behavioral change among household members can take some time. As a result, in order to increase latrine use, a consistent commitment in education, support, and surveillance of latrines must be maintained before a sustainable behavioral improvement is identified in the community.

Similar a study conducted in India also showed that more years since latrine construction increased the utilization of the latrine(32).

Our study indicated that a household family size of less or equal than five persons was not determinant factor for latrine utilization, a finding consistent with contradicts studies in other areas of Ethiopia such as in Southeast Zone of Tigray (29) and in Hawassa. This may be attributed to the fact that only 31 percent of children are in grade 8 and therefore have the ability to affect their families.

Sharing a latrine with less family members results in the latrine being used less often overall, making it more likely to be cleaner, which could contribute to increased latrine use. Another potential explanation for dirty latrines, according to this report, is the existence of a larger family size, which may undermine an individual's sense of obligation to use the latrine properly.

In this report, the majority of households with children under the age of five had unsanitary child excreta disposal. From 290 households with children under the age of five who do not use the latrine, 139 (48%) threw it away from the home, either in the drain/ditch, 67 (23%) left exposed, or 49 (17%) buried in the compound, which is too shallow to protect contamination. Only 35(12%) correctly dispose in pit latrine.

The use of latrine for safe disposal of children feces lower than when compared with study in Northwest Ethiopia in which 8.8% of children aged 3-5 use latrine and 68.3% had sanitary disposal of child excreta (28). However, it is lower than study conducted in India in which less than 21% of children excreta disposed safely(32). The difference in sample size, time of the study, and the difference in the background of study areas might explain these variations.

Limitations of the study

During this study, latrine utilization was measured using self-reported use by respondents and proxy indicators. As a result, there could be a potential social desirability bias as well as observation bias, and this could cause under-and over-use reporting.

In the absence of follow-up observational data, this work may significantly underestimate or overestimate the magnitude of latrine utilization and other independent variables.

The difficulty of establishing causal relationships between latrine utilization status and independent variables and seasonal variation was another limitation of this cross-sectional study.

Strength of the study

- Observation checklist was used to identify proper utilization of latrine by sign of latrine use is recommended.
- Community based particularly addressing the rural community and it was high response rate 98.6%

Conclusion

Based on the findings, we concluded that about (59.5%) of households had a latrine functional. From this study, we concluded that factors significantly associated with latrine utilization were a household religion of the household, climate condition, reward or punishment in the community, fresh foot path leading to the latrine, Hand washing give service, and number of years since latrine construction of the household of the latrine.

Recommendation

The following suggestion was addressed to improve the proper utilization latrine in this study based on the results:

- The Health Extension Workers (HEWs) and lower administrative officials should have to work on sensitization and awareness creation regarding utilization within their community to bridge the apparent knowledge and attitude gaps.
- The government and partners should have to promote improved sanitation options that are adoptable by the community and should have to equip the community with the construction skills.
- The government and local administrative bodies should have to undertake a routine assessment on the usage of latrine within the community.
- Furthermore, the study recommends that in-depth formative research be undertaken to explore how existing latrine use barriers can be addressed in order to enable the larger segment of the population to improve and consistently use their latrine

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ANNEXES

Annexes I

Annex I A Questionnaire

Annex II Questioners (English) *Questionnaire Designed to assess Magnitude of Latrine Utilization and Associated factors in rural areas of Diksis, Woreda, Oromia, 2020*

Identification

Date of the interview D/M/Y__/__/___

Name of Kebele _____

Name of Village/Gare_____

Code of the respondent_____

Part 1. Socio-Demography Charactestics				
Sr.No	**Variables**	**Possible answer**	Skip	Code
Q101.	Climate condition of of the Kebele	1. Highland/Dega 2. Temperate 3.Desert/Kola		
Q102.	Sex of the respondents	***1. Male____*** ***2. Female_____***		
Q103.	Age of the respondent	_____year		
Q104.	Sex of the Head of the household	***1. Male____*** ***2. Female_____***		
Q105	What is your religion?	1. Orthodox 2. Muslim 3. Catholic 4. Protestant 5. Other if (specify)……..		
Q106	Marital status of the head of household?	*1. Never married* *2. Currently married* *3. Divorced/separated* *4. Widowed* *5. Other*		
Q107.	What is Educational status of husband?	0. Illiterate 1. Grade 1-8 2. Grade 9-12 **3. >12grade**		
Q108.	What is Educational status of wife?	0. Illiterate 1. Grade 1-8 2. Grade 9-12 **3. >12grade**		
Q109.	What is the occupation of husband?	1. Farmer 2. Gov't employee 3. Private		

		4. Other		
Q110.	What is the occupation of wife?	1. Farmer 2. Gov't employee 3. Private 4 . Other		
Q111.	Total number of family member (those living in one house)?	1. ≤5 family members 2. >5 family members		
Q112	Is there <5 Year child among house hold member?	1. Yes 2. No		
Q113.	Are the school age children of any age attending formal education?	1. Yes 2. No	If no skip to Q116	
Q114	If answer for Q113 is yes how money?	_____		
Q115.	If answer for Q113 yes what is the level of their education	1. Primary 2. Secondary 3. Higher education (>12)		
Q116.	What is the Religious of the respondent?	1. Orthodox 2. Protestant 3. Muslim 4. Wakefeta. 5. Catholic 6. Others (specify)__		
Q117.	Ethnicity	1. Oromo 2. Amhara 3. Tigre 4. Gurage 5. Others (specify)__		
	Part II. Practice of sanitation			
Q200.	Is the latrine available latrine being functional now?	1. Yes ***2. No***	**If NO Skip to Q203**	
Q201.	How far since you own your latrine?	1. <1year 2. 1-2 years 3. 2-3 4. >3years		
Q202.	If answer for Q200 yes, Do all household members always use latrine?	1. Yes all are Always use latrine 2. No all are not Always use latrine	**If yes Skip to Q208**	
Q203.	If answer to Q201 is No, what are the possible reasons? ***[Do not Read all options, check all that apply]***	1. Difficult to them to use latrine 2. Due to others use it, latrine is busy 3. No material to construct 4. Latrine pit is full 5. The slab is not safe to use		
Q204.	***What*** are the possible reasons for non-functionality of the latrine? ***(Do not read options, Circle all that applies)***	1. I have no money to maintain 2. A lot of people use the latrine, so i am not concerned to maintain		

		3. No material to construct used to maintain 4. Latrine pit is full 5. The slab is not safe to use 99. Others		
Q205.	If answer for **Q203 is NO all** member, among your house hold, who uses the latrine always? ***(Do not read options to the respondent, Circle all that applies)***	***1.*** Adults- men ***2.*** Adults-women ***3.*** *Anybody in the HHS* *4. School age student* *5. Elderly people* *6. Under five children* *7. Disabled people*		
Q206.	If answer for **Q203 is NO all** member, among your house hold, who are not uses the latrine always? ***(Do not read options to the respondent, Circle all that applies)***	***1.*** Adults- men ***2.*** Adults-women *3. Anybody in the household* *4. School age student* *5. Elderly people* *6. Under five children* *7. Disabled people*		
Q207.	Is there any house hold members ***those have problem*** to properly utilizing the latrine due to individual problem	1. Yes 2. No	**If no Skip to Q210**	
Q208.	If answer for Q207 is yes, what is the reason?	1. Being patient 2. Old age 3. Injury 4. Disability 5. Pregnancy 6. During a pried 7. Being child		
Q209.	If there is person that don't utilize latrine among member, what are the possible reason?	1. Offensive odor 2. Squatting hall is big 3. Not comfortable to use 4. The slab is not safe to use 5. Write other reason		
Q210.	What kind of arrangement is the latrine? ***(Observe and indicate the arrangement, multiple response is not allowed)***	1. Private latrine/inside the living house 2. Private latrine/outside the living house 3. Shared with other households /communal 4. Shared with the public 5. Other		
Q211.	Does your latrine affected by natural disaster like wind and flood?	1. Yes 2. No		
Q212.	During your latrine not give service, where Does you defecate?	1. Neighborhoods 2. Open field		

		99. Other place		
Q213.	Do you wash your hand after you use latrine?	1. Yes 2. No	**If NO Skip to** Q214B	
Q214A.	If answer for Q213 is yes, do you use soap or substitute?	1. Yes 2. No		
Q214B.	If answer for Q213 is No, what are possible reason?	1. No hand washing facility 2. Due to shortage of water 3. Do not know the importance of hand washing 99. Other specify		
Q215.	How baby's feces are usually disposed of? ***(Do not read options, Circle only one which is very often)***	1. Put into latrine using Popo 2. Put into drain/ditch 3. Thrown in garbage Buried. 4. Left open 5. Other (specify) _____		
Q216.	In the past six month, have you ever seen a person defecating outside/ on the field	1. Yes 2. No		
Q217.	During journey on the road, when you want to defecate what action do you take?	1. I will use public latrine beside the road 2. Defecate on the field 3. Use latrines of house hold found on the road side. 99. Other action ------		
Q218.	Is there a reward or punishment system regarding latrine utilization in your community?	1. Yes ***2. No***		
Q219.	Have you ever this house hold was graduated as model House hold	1. Yes 2. No		
Q220.	Have you ever participated in community led total sanitation and hygiene program?	1. Yes 2. No		
Q221.	This house hold is found from health facility including health post at___?	1. Far (>30 minute walking time) 2. Near (<30 minute walking time		
Q222.	Have you seen / heard any promotion on latrine utilization in the last six months?	1. Yes ***2. No***	**If NO Skip to 224**	
Q223.	If Q222 is yes, through which source or media have you heard? Workshop /training? ***(DO NOT read options, circle all that apply).***	1. Radio 2. Television 3. Newspaper 4. Health worker 5. Health extension workers 6. Health development army member 7. Family member		

		8. Brochure ***99. Others specify*** _____		
Q224.	Does health extension worker house hold visit have contribution to latrine utilization	1. Yes 2. No		
Q225.	Do you belief that reward or punishment system in the community regarding latrine utilization helps at all house level for latrine utilization?	1. Yes ***2. No***		
Q226.	What type of latrine available for your house hold? ***(observe the storage, tick only one)***	1. Flush/pour flush to septic tank/ sewer line 2. Ventilated improved pit latrine 3. Traditional pit latrine with cemented slab or stone slab 4. Traditional pit latrine with wood log and earth cover 5. Composting 6. Bucket latrine ***99. Others (specify)____***		
Q227.	Is the latrine accessible to all?	1. Yes 2. No		
Q228.	Does the latrine have wall for privacy?	1. Yes 2. No		
Q229.	Does the latrine have roof?	1. Yes 2. No		
Q300.	Does the latrine have slab?	1. Yes 2. No		
Q301.	Does the latrine have only one squat hole?	1. Yes 2. No		
Q302.	Does the latrine squat hole have cover?	1. Yes 2. No		
Q303.	Is the toilet slab washable?	1. Yes 2. No		
Q304.	Is the toilet slab easily cleanable?	1. Yes 2. No		
Q305.	Is the available latrine being hygienic?	1. Yes 2. No		
Q306.	Does latrine have hand washing facility (within 3 meters)?	1. Yes 2. No		
Q307.	Is hand washing facility is have water within it?	1. Yes 2. No		
Q308.	Near the hand washing facility, is there soap/substitute now?	1. Yes 2. No		
Q309.	during this visit, does the hand washing facility give service	1. Yes 2. No		
Q310.	Is there a vent pipe for the latrine?	1. Yes 2. No		

Q311.	**Fresh foot path** leading to the latrine?	1. Yes 2. No		
Q312.	**Splash of urine or water** on the latrine slab/floor?	1. Yes 2. No		
Q313.	Are there **feces around the household**/latrine?	1. Yes 2. No		
Q314.	Are there fly (even a single fly) in the latrine?	1. Yes 2. No		
Q315.	Around the latrine or in the compound of the house hold, do you observe human feces?	1. Yes 2. No		

Mallatoon nama gaafanoo gutuu ful-duurattii kan malataa'uu dha.

LakkoofsaAddaa Waraqaa Gaafii fi deebii_____

guyyaa gaafi fi deebii_____

Q101. Maqaa gandichaa_____

Q102. Maqaa Garee_____

Q103. Halaa qIllensaa gandichi keessaatti argamuu 1 Baddaa 2. Badda Daree 3. Gammoojjii

Q104. Lakkoofsa Addaa Hirmaataa_____

Q105. Saala 1.Dhiiraa 2. Dhalaaa

Q106. Umrii waggaan _____ Kutaa 1ffaa. Haala hawwaasummaa fi rawaanni mala jireenyaa ilaalchisee

Q107. Ittigafatamaan/wamamaan abbaa waarraa eenyu?

1. Abbaa warraa 2. Hadha Warraa 3 Kan birooti

Q 108. Haala uudhaf heerumaa ittigaafatamaa abbaa waarraa

1. Gonkumaa hin heerumne/fuune

2. Yeroo ammaa fudee/heerumeeti kan jiru.

3. Kan hike ykn addaan bahan

4. Kan jala du'e'duute

Q109. Sadarkaa barumsaa abbaa waarraa/yoo hin heerumne abban mana gaggeessu meeqa

1. Gonkumaa hin barannee 2. 1-8 keessaatti

3. 9-10 4 .10-12 5. >12

Q110. Sadarkaa barumsaa haadha warraa

1. Gonkumaa hin barannee 2. 1-8 keessaatti 3.9-10 4.10-12 5.>12

Q111. Akaakuu hojii haadha warraa 1.Q/Bulaa 2.Dhunfaaa. 3. Kan biroo

Q112. Akaakuu hojii abbaa warraa 1.Q/Bulaa 2.Dhunfaaa. 3. Kan biro

Q113. Waggaatti galii hanga meeqaa argatu? 1. Xiqqaa <3600 2. G/Galeessi 3600-7200

3. Guddaa 7200-10800 4 baay'ee gudaa >10800

Q114. Baay'inaa maatii waliigalatti _____

Q115. Daa'imtti umriin ishii waggaa 5 gadii ni jirtii ?1. Eyyee 2. Miti

Q117. Daa'immaan umrii mana barumsaa (6-12) barumsa idilee hordofaa jirtu ni jirtii?

1. Ijoolleen umrii mana barumsaa keessaa jiran hin jiran,

2. Ni jiran, garuu barumsa idilee hordofaa hin jiran.

3. Ni jiran Muraasa qofatu mana barumsa idilee hordofaa jira.

Q118. Amantaan ati ittin waaqeffaattu maali?

1. Ortodosii

2. Protestaantii

3.Musiliim

4. Waaqeffannaa

5.Kaatolikii

6. Kan biro

Q119. Sabni kee malii ? 1. Oromoo 2. Amahaaraa 3.Guraagee 4.Sidaamaa 5.Tigree 6.Kan biro

Kutaa lama.Waa'ee qulqulliin ilaalchisee gaaffiiwwaan dhihaatan.

G200. Abbaan warraa/Maatiin kun mana fincaanii ni qabaa? 1.Eeyyee 2.Miti

G201. Deebiin gaafii 121ffaa Miti yoo ta'e Atii fi maatiin keessan eessatti bobbaatu?

1.Mana fincaanii ummataa

2. Mana fincaanii olla

3.Mana fincaanii fira

4.Dirreetti /Bosona/Dhagaa jala

5. Kan biro yoo jiraate haa ibsamu_____

G202. Deebiin gaafii 121ffaa miti yoo ta'e dhimmoni sababa ta'u danda'an maali fa'a?

1.I tti fayyadama mana fincaanii irratti hubannoo dhabu.

2. Hojetachuuf qarshii hin qabu.

3. Meeshaan/qodaan ittin ijaaran hin jiru.

G203. Deebiin G201 Mana fincaanii yeroo ammaa tajaajjila ni kenna? 1.Eeyyen 2. Miti

G204. Deebiin G201 eeyyen yoo ta'e,Mana fincaanii gosa akkamittu jira?

1. Flush/pour flush to septic tank/pit latrine/sewer line

2. Ventilated improved pit latrine

3. Traditional pit latrine with cemented slab

4. Traditional pit latrine with wood log and earth cover

5. Traditional pit latrine with stone slab

6. Pit latrine with wood log having one or multiple holes

7. Pit with NO slab of any type

8. Composting latrine

9. Bucket latrine

10. Bed pan (Popo)

11. Open space

12. Others (specify) _____

G205. Deebiin G201 eeyyen yoo ta'e , waggaa meqaaf itti fayyadamte? 1. <1 2.1-2 3.2-3 4.>3

G206. Deebiin G201 eeyyen yoo ta'e ,Miseensi maatii hundi itti fuffinsaan mana fincaanii ni fayyadamu?

1. Maatii hundi itti fuffinsaan ni fayyadamu.

2. Darbee darbee maatii hundi ni fayyadamu.

3. Maatii hundi itti fuffinsaan hin fayyadaman.

G207. Deebiin G204 eeyyen yoo ta'e, miseensa maatii keessa kan yeroo hundaa fayyadamu eenyu?

1. Dhiira ga'eessa
2. Dubartii ga'eetti
3. Waggaa shanii gadi
4. Namoota naannoo san jiran hunda
5. Miseensa maatii hunda
6. Qaama midhamtoota
7. Mangodoota

G208. Mana fincaanii tajaajjila kan hin kennine yoo ta'e maaliif?

1. Suphuuf qabeenya hin qabu
2. Namooni biraa itti waan fayyadamaniif,maaltuuna dhibe.
3. Meeshaan ittin suphuu hin jiru
4. Bolloon mana fincaanii guutuudha
5. Islaabiin ammansiisaa miti.
6. Kan biraa yoo jiraate ibsaa….

G209. Hallii mannii fincaanii ijaarramee jiruu akkaami (ilaaluudhaan kan guutamu qabu, tokkoo qofatu guutamuu qab.

1. Mna fincaanii dhuunfaa /mana keessaatti
2. Mana fincaanii dhuunfaa/ mana jireenyaatiin alatti.
3. Mana fincaanii maatii biraa waliin walitti ijaaramee jiru
4. Mana fincaanii hawaasaa fayyadamu
5. Kan biro yoo jiraate haa baraa'u

G210. Miseensa maatii keessanni keessaa mana fincaanii haalan kan hin fayyadamne jira?

1. Eeyyen 2.Miti

G211. Deebiin G211 eeyyen yoo ta’e, sababni isaa maalinni?

1. Foolii qaba

2. Qaawwii mana fincaanii bal’aadha

3. Mani fincaanii fayyadamuuf mijataa miti.

4. Islaabiin/irr lafa isaa mijataa miti

5.Kan biro yoo jiraate yaa bareeffamu

G212. Udaan daa’ima yeroo baay’ee akkamin maqsituu? 1. Poppo fayyadamuun mana fincaanitti gatama

2. Bishaan/lolaa yaa’uutti gatama 3. Ni awaalama 4. gubuu 5. Dirree irraati gatama

G213. Ji’ootan darban jahan keessatti namni dirree irratti bobba’u argitee hi beektuunii beektuu? 1.Eeyyen 2. Miti

G214. Karoora fi gamaagama raawwii hojii eegumsa fayyaa naannoo irraattii hirmaatanii beektuu?1. Eeyyee 2. Miti

G 215. Hojii eegumsa fayyaa naannoo ilaalchsee sirni baadhaasaa ykn Addabii akka ganda keessaanitti ni Jira? 1. EEyyee 2. Miti.

G216. Mannii fincaani ni jira yoo iddoo harka dhiqannaa dhiheenyatti ni qaba?

1. EEyyee 2. Miti.

G217. Gaaffiin lakk.

217 eeyyee yoo ta’e, meeshaan harka dhiqannaa qophaahe bishaan qaba?

1. Eeyyee 2. Miti.

G218. Saamunaa ykn Daaraan iddoo harka dhiqannaa qophaa’e bira ni jiraa? 1. EEyyee 2. Miti.

G219. Meeshani harka dhiqannaa qophaahee tajaajila kennaa jiraa/ tajaajila kennaa jiraachuu isaa mallatoolee ittin mirkaneeffatan ilaalluyun haa mirkanahuu?

1. EEyyee 2. Mit

Participant information sheet and informed voluntary consent form.

My name is---------- I am working as a data collector for the study being conducted in this community by Birhanu Alemu Lesa who is studying his Master's degree at Addis Ababa University College of Health Sciences School of public health.

I kindly request you to lend me your attention to explain you about the study and being selected as the study participant.

The study title

Latrine Utilization and Associated Factors in the Rural Communities of Diksis woreda, West arsi Zone, Oromia Regional State, Ethiopia

The purpose of the study

The purpose of this study is to assess the latrine utilization and associated factors in the Rural Communities of diksis woreda, West arsi Zone, Oromia Regional State,Ethiopia knowing this have paramount importance for the district health office to plan strategies that can address better latrine construction skills and its proper utilization system in the area.

Moreover, the aim of this study was to write a thesis as a partial requirement for the fulfillment of a Master's Program in General public health for the principal investigator.

Procedure and duration

I will be interviewing you using a questionnaire to provide me with pertinent data that was helpful for the study. There are 37 questions to answer where I will fill the questionnaire by interviewing you. The interview will take 37 minutes.

Risks and benefits

The risk of being participating in this study is very minimal, but only taking your time. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information for the local health planners.

Confidentiality

The information you will provide us will be confidential. There will be no information that will identify you in particular. The findings of the study will be general for the study community and will not reflect anything particular of individual persons or housing. No reference will be made in oral or written reports that could link participants to the research directly.

Rights

Participation for this study is fully voluntary. You have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Contact address

If there are any questions or enquires any time about the study or the procedures, you can contact by using the following addresses.

Principal investigator: Birhanu Alemu Lesa

E-mail:birhanualemu52@gmail.com

Mobile phone: +251-921-079-728

Addis Ababa University College of Health Sciences School of public health

: Office phone: P.O.Box:

Addis Ababa

Advisor: Dr.abera kumie

E-mail:aberakumie2@yahoo.com

Mobile phone:- +251-911-67-4644

Declaration of informed voluntary consent

I have read/was read for me the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that I have the right to withdraw from the study at any time or not to answer any question that I do not want.

Therefore, I declare my voluntary consent to participate in this study with my signature as indicated below.

Name and Signature of participant: ----------

Signature of data collector ----------

Annexes IB**.**

Participant information sheet and informed voluntary consent form inAfan Oromo Version

Maqaan koo----------jadhama. Obbo Birhaanuu Alaamuu Lasa kanjadhaman Yuunivarsitii finfinne Gosa barnoota Fayyaa haawaasaa waligalaanqo'annoo sadarkaa baruumsaa Digrii lamafaadhaaf raawwatuuf gaafannoo akkan guchisuufkaniin filamee dha. Aniis kabajaan kaniin isiin gaafadhuu maaluummaa waa'ee qo'onichaanisiinis maaliif qo'onichaaf akka filatamtan ibsa waaniin isiini godhuuf akka na dhageefatanifii.

Mata-duree Qo'onichaa

Naannoo Oromiyaa, arsi baha, Aanaa dikisi Baadiyaamanneenjireenyaa jiran keessattii itti fayyadama mana fincaaniifi wantoota dhimma kana wajjiin hidhataqaban ilaalata.

Kaayyoo Qo'annoo kanaa

Kaayyoon Qo'annoo kanaa Aanaa Diksisi keessattii abbootii warraatiin ittiifayyadamnii mana fincaanii maal akka fakaatuu fi dhiimmoota kana wajjiin hidhata qabanilaalata.Haala kana beekuun Waajiira Eeguumsa Fayyaa Aanaaffaayidaa argamsiisa**.** Kuniswaajiirii haanqiina jiruu adda baasuun ragaa kanaittii fayyadama tajaajiila mana fincaaniimirkaneessuuf akka karoorfachuu danda'uu isa dandeesisa. Inii kan biraatiis kaayyoon qo'annookanaa dhaleessaan qo'annoo kanaa Fayyaa Haawaasaa Waligalaatiin sadarkaa Baruumsaalamafaatii bareefama ebbaa qopheessuuf fayyada.

Adeemsa Qo'onichaa

Anii gaafilee duubisuudhaan isiin imoo gaafileedhaaf deebisaa keenuun Daqiqaa 37'f waliin tuura.Baay'inii gaafileetiis 37. Kanaafuu ani gaafilee isiinif duubiseetiin deebilee naa keenitaniif idoo isaaniiti niin guuta.

Faayidaa fi Midhaa

Qo'annoon kun sa'aa keessan muraasa fuudhachuun ala rakkoon ini fiduu hin jiruu. Qo'annoo kanarattii hirmaachuu keessaniniis faayidaan haarkarattii argatan hin jiruu. Haa ta'uu malee bu'aan qo'annoo kanaa naannawa kanattii fayyaa irrattii dhaabilee hoojataniif ragaalee fayyadan ni keena.

Icituumaa isaa

Ragaaleen keenaman iciitin isaanii agamaadha. Gaafannoo keessatiis haala dhiimma keessan biifa adda ta'een kan gaafatuu hin jiruu. Bu'aan qo'anichaas iddoo qo'annoon ittii gaggeefameef ragaa cuunfamee kan kennamuu yommuu ta'uu, maaluumaa nama tokko ykn Maaluumaa mana

sanaa kan muul'isuu mitii. Qo'anichiis haala kaminuu jechaanis taee bareefamaan maaluumaa hirmaataa qo'anichaa haala ibsuun fakeenya godhee hin dhaleessuu.

Mirga Hirmaataa

Qo'annicha irrattii hirmaachuun, guutumattii feedhinaa irrattii kan hundaa'ee dha. mirga hirmaachuus hirmaachuu dhabuus qabduu. Hirmaachuuf fedhinaa kan hin qabnee yoo ta'ee yeroo kamitiyuu dhaabuu ykn gaafilee deebisaa kennuu hin barbaadnee deebisaa kennuu dhabuu mirga qabduu. Sa'aa kamitiyuu qo'anichaa yoo adda dhaabdan haallii biifa addattii ittii ilaalmatan hin jiruu.Odeefannoo dabalataa argachuu yoo isiin barbaachisee qo'onicha kanilaalatuu gaafilee kamiiyuu ykn yaada yoo qabaatan teessoolee ittii aanan kanaan fayyadamuun odeefannoo argachuu dandeessuu.

Ogeesa Qo'annoo kanaa

Maqaa : Obbo Birhaanuu Alaamuu

Lakk. Bilbilaa:+251-921-079-728

Email:birhanualemu52@gmail.com

Ogeesaa Qindeesaa

Advisor: Dr.abera kumie

E-mail:aberakumie2@yahoo.com

Mobile phone: - +251-911-67-4644

Yuunivarsitii finfinneettii mana baruumsa fayyaattii kooree Qo'annoo fi qorannoo hoordofii naamuusaa.

Lakk. Bilbilaa:

Lakk. Postaa finfinnee

Feedhinaa irrattii kan hundaa'ee qo'annoo kana irrattii hirmaachuu murteessuu bareefama ibsuu Ibsii walii-galtee kuunii bifa gaariin naaf duubifameera.Aniis kaayyoo qo'onnichaa haala gaariin huubadheera. Faayidaa fi midhaa isaa, icituummaa isaa, mirga kiyya akkasuumattis gaafilee qo'annoo ilaalatan fi yaada yooniin qabaadhee gaafachuu kan danda'uu ta'uu huubadheetiin jiira. Wantoota ifa naaf hin taanee akkan gaafadhuu carraan naaf keennamee jiira.Aniis miirga deebisuu dhabuu akkan qabuu naaf himameera. Kanaafiis feedhinaa irrattii kan hundaa'ee qo'annoo irrattii hirmaachuuf murteessee mallattoo koo armaan gadittii kaa'eera.

Mallattoo fi maqaa hirmaataa----------

Mallattoo gaafannoo nama guchisisee----------

LETTER FOR DECLARATION

By signing below, I proclaim that this research is my original work, it was not done by others and claimed by an others work in any institution or person. This research had used materials that are accredited.

Name of principal investigator: Birhanu Alemu Lesa

Signature: ----------

Date: ----------

Place: Addis Ababa University College of health sciences school of public health.

This thesis has been submitted for for approval to:

Advisor: Abera Kumie (PhD)

Signature: ----------

Date: ----------