



# Assessing Factors Affecting the Availability and Utilization of Latrines at Chinseu Village in Zomba, Malawi

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**Abstract:** Poor sanitation is a pressing public health concern globally, with significant implications on disease prevention. This study aimed to assess factors affecting the availability and utilization of latrines in Chinseu Village, Zomba District, Malawi. A quantitative cross-sectional design was employed, targeting 64 households randomly selected in that village with and without latrine. Data were collected using questionnaires and analyzed using SPSS. The study revealed that households from the village utilize latrines, however, only 54.7% of the households owned latrines, while 45.3% relied on shared facilities. Maintenance and cleanliness issues (31.3% poorly maintained) were highlighted as barriers to effective utilization. The study also discovered that almost all the study participants had knowledge on the benefits of latrine utilization (81.3%), yet significant associations were found between latrine availability and socio-demographic factors, which included age ( $p=0.033$ ), economic status ( $p=0.025$ ), and occupation ( $p=0.020$ ). The study, therefore, concluded that latrine availability is affected by age, economic status and occupation status. The study's critical recommendations for improving sanitation outcomes in similar contexts include enhancing community education, subsidizing sanitation facilities, and integrating sanitation initiatives with socio-economic development programs.

**Keywords:** Latrine availability, Sanitation, Public health, Socio-demographic factors, Malawi

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## 1. Introduction

Sanitation is a critical determinant of public health, with inadequate facilities linked to diseases such as cholera, dysentery, and intestinal infections. Globally, 419 million people practice open defecation, predominantly in rural areas of Sub-Saharan Africa (Belay et al., 2022). In Malawi, 26% of the population has access to basic sanitation, while 6% still practice open defecation, contributing to high morbidity and mortality rates (United Nations International Children's Emergency Fund, 2020). Chinseu Village in Zomba District exemplifies this challenge. The availability and proper utilization of

sanitation facilities enhance good health among people by promoting proper waste disposal. Consequently, the absence of sanitation facilities increases the risk of water borne diseases such as cholera, diarrhea, dysentery, typhoid as well as intestinal worm infections (Amanabo-Arome, & Abbas, 2021).

Chinseu Village which is located in Zomba District is one of the villages within Nkasala Health Centre Catchment Area with low coverage of latrines. According to Community-Led Total Sanitation (CLTS) data from Zomba District Health Office (DHO), there are 433 households in Chinseu Village and only 242 households have latrines (Zomba District Health Office, 2023). This

leaves approximately 44% of households without private sanitation facilities, forcing residents to either share facilities or resort to open defecation.

The issues of sanitation in Chinseu Village are brought in by several socio-economic and demographic factors. The economic constraints hinder the construction of adequate latrines, while cultural and behavioral barriers contribute to low utilization rates. Furthermore, the lack of proper maintenance plans coupled with poor hygiene of the limited available latrines discourage their use. Dealing with such challenges commands a comprehensive understanding of the factors affecting latrine availability and utilization, as well as targeted interventions to promote sustainable sanitation practices.

The absence of adequate facilities poses significant health risks among the population under study highlighting the need to explore factors influencing latrine availability and utilization in the village. This study addresses this gap, providing actionable insights to inform sanitation interventions. Besides, there are very few studies found in Zomba that report on the availability and utilization of latrines. The study was significant as it addressed the critical need for proper sanitation facilities, which directly impact human health and dignity. The findings will aid health workers and policymakers in promoting health education, understanding barriers to sanitation, and enhancing latrine utilization practices.

## 1.1 Research Questions

1. What is the current state of latrine availability and utilization in Chinseu Village?
2. What factors influence the availability and utilization of latrines in Chinseu Village?
3. How do socio-demographic factors, such as age, economic status, and occupation, impact latrine availability in Chinseu Village?

## 2. Literature Review

In order to ensure proper sanitation, it is widely accepted that the human population must have access to sanitary facilities. According to the World Health Organization (WHO), appropriate sanitation can be achieved when adequate facilities and services, are available for the safe disposal of human urine and faeces (World Health Organization, 2022). Inadequate sanitary facilities in homes and communities poses serious health challenges to many people and increase the occurrence of diseases like cholera and diarrhoea.

The availability and utilization of pit latrines is still a challenge in many African countries. Studies across Sub-Saharan Africa and other regions highlight low levels of latrine availability and utilization. For example, findings

from a study conducted in Southern Ethiopia, revealed that only 65.8% of the households had latrines, and most of which lacked essential features such as doors or handwashing stations (Woyessa, et al., 2022). Similarly, in Northwest Ethiopia, only 41.9% of households used latrines properly, with significant waste mismanagement (Omer et al., 2022). A Tanzanian study revealed that only 68.4% of the surveyed households had latrines, and handwashing facilities were present in just 42% of homes (Belachew et al., 2018). Similar results were observed in a study where most of the latrines did not have a squat hole cover and doors (Degu, et al., 2021).

Other studies indicate that socio-economic and demographic factors significantly influence sanitation practices. In Southwest Ethiopia, 67.1% of rural households used latrines, but utilization varied based on education, economic status, and the presence of hygiene promotion programs (Golla et al., 2023). In Northern Tanzania, 50.3% of households practiced open defecation despite having access to water sources, demonstrating behavioral and cultural barriers (Nyanza et al., 2018).

In a related study conducted in Northwest Ethiopia, only 3.7% of the children in the research region were using latrines, and only 41.9% of the households used them properly. Children's waste was dumped in fields or backyards by almost 50% of the households. Even though there were working latrines in 57.4% of the homes in the compound. Household members utilized latrines for the following reasons: 67.3% understood the risks of excrement to health, 22.2% wanted privacy, while 10.5% had nowhere else to relieve themselves (Omer et al., 2022).

This review supports a theoretical framework combining the health belief model and socio-ecological theory. The framework emphasizes the interplay between individual perceptions, community norms, and structural factors in shaping sanitation behaviours. Key constructs include knowledge, accessibility, economic constraints, and cultural attitudes toward latrine usage. Further, it highlights the importance of understanding multi-level factors affecting latrine availability and utilization. By addressing gaps in behaviour change theories and integrating community-specific insights, future research can inform effective sanitation interventions that enhance public health outcomes.

## 3. Methodology

### 3.1 Design

A research design is a plan of action for implementing the research strategy (collecting and analyzing data) to successfully tackle a research challenge in a logical and cogent manner (Williams, 2007). This study employed a quantitative approach and a cross-sectional design to assess

factors affecting the availability and utilization of latrines among households in Chinseu Village, Zomba District. The cross-sectional design allowed for a snapshot analysis of the current state of sanitation in the community, providing insights into the relationships between socio-demographic factors and latrine availability and usage.

### 3.2 Study Place

This study was conducted in Chinseu Village, located in the catchment area of Nkasala Health Centre, Zomba District, Malawi. This village was selected due to its low latrine coverage, as indicated by Community-Led Total Sanitation (CLTS) data from the Zomba District Health Office. Out of the 433 households in the village, only 242 were reported to have private latrines, making it an ideal location for exploring sanitation challenges.

### 3.3 Population, Sample and Sampling Techniques

Chinseu Village had a population of 433 households. A stratified systematic random sampling technique was used to select the households for this study. The sampling interval was determined by dividing the total number of households in the village (433) by the sample size (64), yielding a sampling interval of approximately 7. A random starting point within the first seven households was chosen, and every seventh household was included in the study.

### 3.4 Sample Size Determination

This study targeted heads of households or their representatives in Chinseu Village. Both households with and without latrines were included to ensure a comprehensive understanding of the factors influencing sanitation practices.

#### *Inclusion Criteria*

1. Residents of Chinseu Village aged 18 years and older.
2. Households with or without latrines.
3. Individuals who provided informed consent.

#### *Exclusion Criteria*

1. Temporary residents or visitors.
  2. Individuals who declined to participate.
- The sample size of this study was determined using Andrews Fishers formula.

$$n = \frac{z^2 \times p(1-p)}{(e^2)}$$

### 3.5 Data Collection Tools and Process

The data was collected using structured questionnaires which were digitized using Kobo Collection to ensure

accuracy and efficiency. The instrument captured the following information:

- Socio-demographic characteristics (age, gender, education, occupation, economic status, religion, marital status, household size).
- Latrine availability and condition (ownership, distance, maintenance).
- Utilization patterns (frequency, reasons for usage).
- Knowledge and barriers related to latrine use.

*Pre-testing:* The questionnaire was pre-tested in a nearby village to ensure clarity, reliability, and validity. Adjustments were made based on feedback from the pre-test. In the platform, to minimize data entry errors, skips and codes were used, and daily data was downloaded and reviewed to check for irregularities.

### 3.6 Data Analysis

Data was entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics such as frequencies and percentages were calculated for socio-demographic characteristics and latrine availability. Inferential statistics, including chi-square tests, were used to assess associations between socio-demographic factors and latrine availability.

### 3.7 Validity and Reliability

Standard methodologies were used in this study which would help other scholars to reference our findings. For instance, our findings are reliable to health practitioners, both Non- Governmental Organizations and government, implementing the Water, Sanitation and Hygiene (WASH) initiatives in the area. The reliability of this research would also inform policy makers to contribute to implementation of WASH initiatives in the country. Also, the study conformed to the research ethics to avoid injuring the participants. Above all, this study used a sizeable sample size for generalization of the findings.

### 3.8 Ethical Considerations

The ethical approval and clearance were obtained from Malawi National Health Sciences Research Committee (NHSRC) for review and approval. Permission to conduct the study was sought from GVH Chinseu. Informed consent was also taken from study subjects. Information collected from each household was confidential and only used for the purpose of the study.

In this study, standard ethical consent was followed. A complete informed verbal consent was provided and collected from the participants prior to administering the questionnaires. The consent involved provision of the study's objective, voluntary participation, and the security

of data gathered. Consequently, their confidentiality and autonomy (*accept or decline appeal to take part*) were fully respected. The participants' confidentiality and privacy were conserved by coding the data, and to ensure the security of data, the questionnaire was digitalized into secured Kobo collect, which was used for data collection.

### 3.9 Study Limitation

Since the study was self-reporting, there might be dishonest answers by respondents hence not giving a true reflection of latrine utilization and availability. The study also involved few households in the village thereby it was difficult to generalize the findings of the study to the entire village.

## 4. Results and Discussion

Results for this study are given starting with the demographic characteristics of the sample then in accordance to the research questions of the study.

### 4.1 Characteristics of Respondents

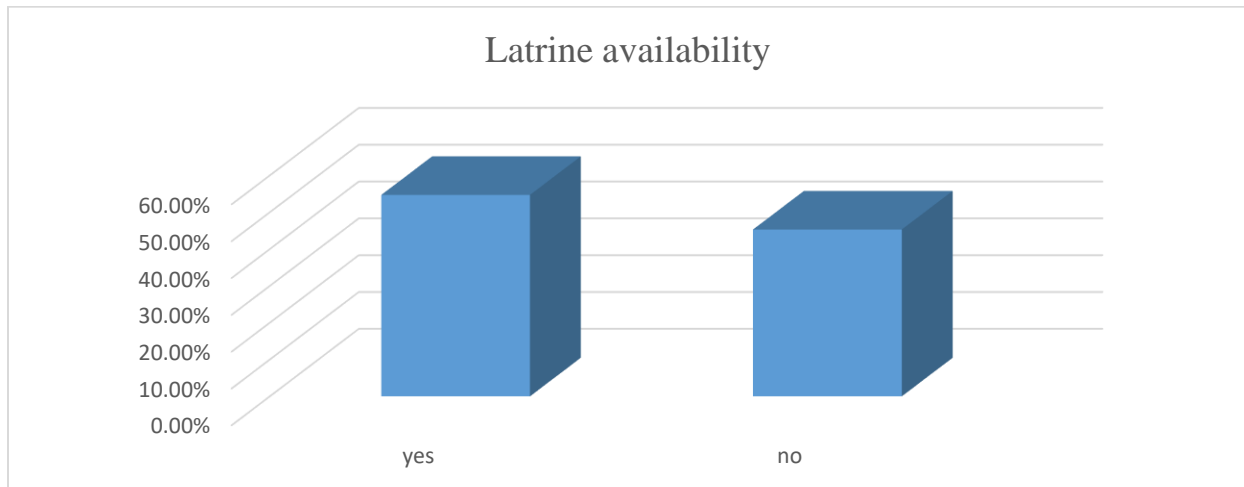
Most of the respondents were female (64.1%), while males were 35.9%. Most participants were aged 19-30 (64.1%), followed by those aged 31-50 (25%). Marital status data revealed that 79.7% were married, with smaller proportions of singles (7.8%), divorced (9.4%), or widowed (3.1%).

Education levels showed that 46.9% of the respondents had attended secondary school, 40.6% primary school, 7.8% tertiary, and 4.7% had no formal education. Most respondents were Christians (89.1%), while 10.9% were Muslims. Household sizes ranged from 3-5 members for 65.6% of participants, while economic status showed 53.1% in the lower class.

**Table 1: Socio-demographic characteristics of the study participants**

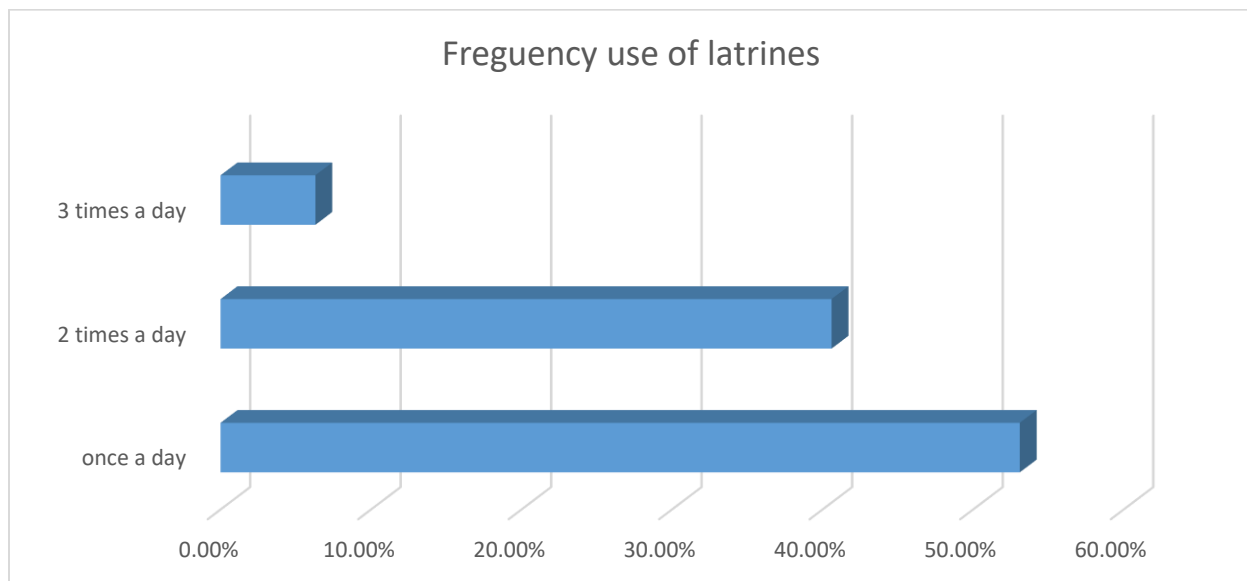
Variable	Description	Frequency	Percent
Sex	Male	23	35.9
	Female	41	64.1
Age	19-30	41	64.1
	31-50	16	25
	Above 50	7	10.9
Marital status	Single	5	7.8
	Married	51	79.7
	Widow/widower	2	3.1
	Divorced	6	9.4
Education level	None	3	4.7
	Primary	26	40.6
	Secondary	30	46.9
	Tertiary	5	7.8
Religion	Christian	57	89.1
	Muslim	7	10.9
Occupation	Working	23	35.9
	Business	13	20.3
	Farmer	18	28.1
	Not working	10	15.6
Household size	1 to 2	11	17.2
	3 to 5	42	65.6
	6 to 10	11	17.2
Economic status	Lower class	34	53.1
	Middle class	30	46.9

**4.2 Latrine Availability:** About 54.7% of the respondents reported owning a latrine while 45.3% relied on their neighbor's facilities.



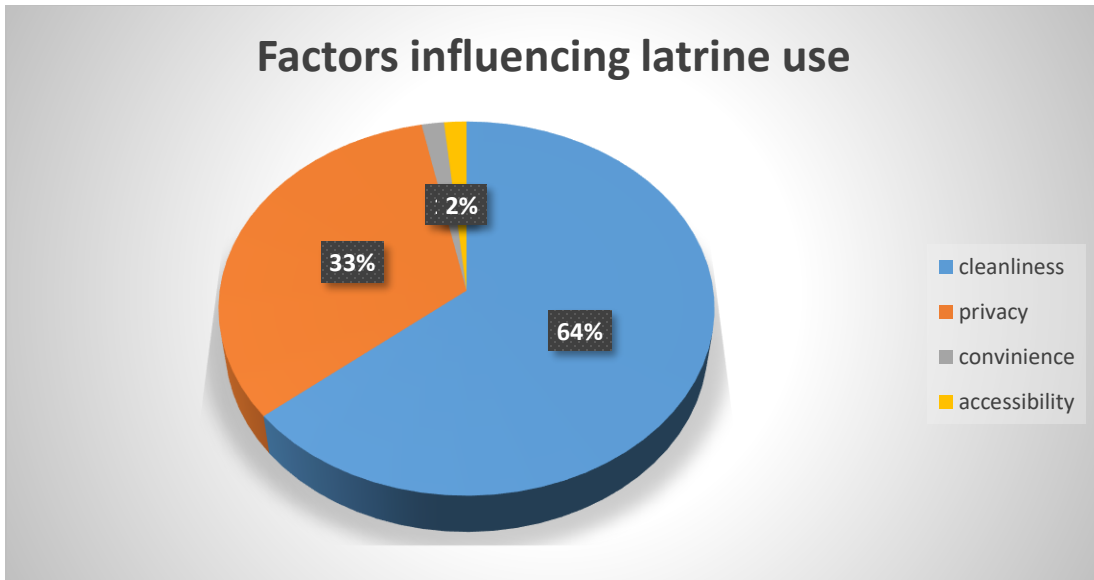
**Figure 1: The availability of latrines**

**4.3 Utilization Patterns:** As seen in figure 2, the usage of latrines varied: 53.1% used latrines once daily, 40.6% twice daily, and 6.3% three times daily.



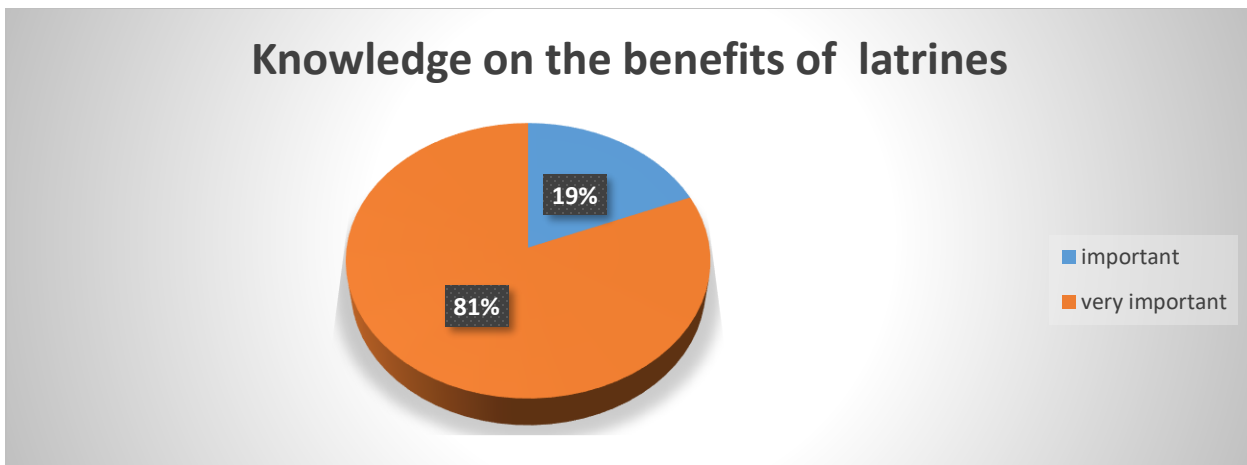
**Figure 2: Frequency of toilet utilization**

**4.4 Factors Influencing Latrine Use:** About 64.1% indicated cleanliness as a factor that influenced their use of the latrine, 33% privacy, 2% convenience and another 2% accessibility.



**Figure 3: Factors influencing latrine utilization**

**4.5 Knowledge on the Benefits of Latrines:** About 81% of participants rated the importance of using latrines for maintaining a healthy environment as very important while about 19% rated it as just important as seen in figure 4.

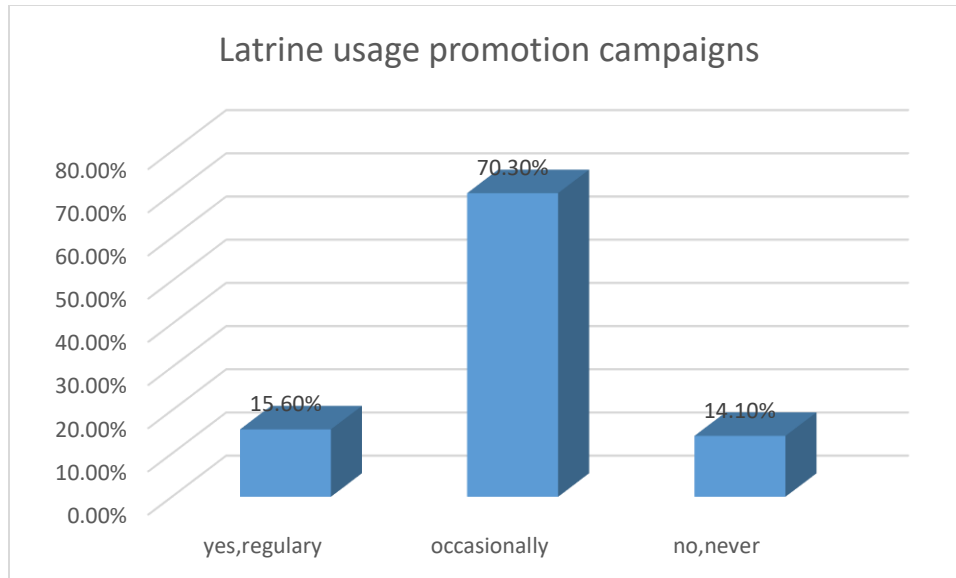


**Figure 4: Knowledge on the importance of latrine utilization**

#### 4.6 Latrine Usage Promotion

Latrine usage promotion messages are being disseminated to the population in Chinseu village, but the frequency of receipt varies widely. Regular Recipients (15.6%), Receive latrine usage promotion messages regularly which likely

have a high level of awareness about proper hygiene practices. Occasional Recipients (70.30%), Received latrine usage promotion messages occasionally which may have some awareness about proper hygiene practices, but may need reminders and non-recipients (14.10%), never receive latrine usage promotion messages and had limited awareness about proper hygiene practices.

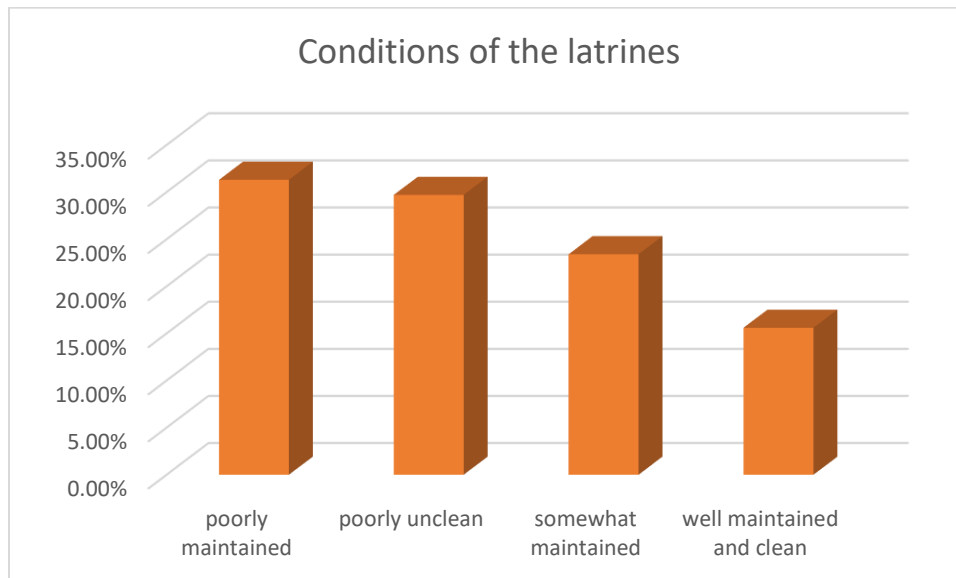


**Figure 5: Educational campaigns or programs promoting latrine usage**

#### 4.7 Condition of Latrines

Most of the respondent's latrines, the distance was less than 30 metres from their houses representing 63(98.4%) while just 1(1.6%) indicated the latrine to be more than 30 metres distant which was because they use neighbor's latrine.

About 20(31.3%) of the available latrines are poorly maintained and 19(29.7%) poorly unclean and about 15(23.4%) somewhat maintained and only 10(15.6%) well maintained and clean. These results Majority of the latrines are not separate for males and females representing 63(98.4%).



**Figure 6: Conditions of the available latrine**

#### 4.7 Demographic Characteristics Associated with Availability of Latrines

Chi square test was carried out to examine the associated factors for latrine availability and utilization at the

household level. Results showed that statistically significant associations at p-value  $\leq 0.05$  were found on age p=0.033, economic status p=0.025 and occupation status p=0.025. Sex, marital status, educational status,

religion and household size did not show any significant association as shown in table 2.

**Table 2: Associations between demographic characteristics and availability of latrines**

SN	Demographic Characteristics	Significance Sig. (2-sided)
1	Age	0.033*
2	Sex	0.825
3	Marital status	0.269
4	Educational status	0.967
5	Religion	0.346
6	Occupation	0.020*
7	Household size	0.089
8	Economic status	0.025*

\*Association is significant at p value  $\leq 0.05$

## 4.8 Discussion

### 4.8.1 Demographic Characteristics

The majority (64.1%) were female, aligning with findings from other studies where women often take primary responsibility for household sanitation (Woyessa, 2022). The age distribution showed a significant association with latrine availability ( $p=0.033$ ), highlighting that younger households, particularly those aged 19-30, were less likely to have latrines. This aligns with (Golla, 2023) who identified age as a determinant of sanitation investments. Married participants constituted the majority (79.7%), indicating the potential influence of family dynamics on sanitation practices. The educational profile showed that secondary education was the most common (46.9%), with low tertiary education levels potentially limiting the adoption of improved sanitation practices.

### 4.8.2 Latrine Availability

The study found that only 54.7% of the households owned latrines, a figure lower than findings in Southern Ethiopia (65.8%), (Woyessa, 2022). While this indicates progress in sanitation coverage, the gap underscores persistent structural and economic barriers. Most households with latrines had them located within 30 meters of the home, aligning with global recommendations for accessible sanitation. However, maintenance and cleanliness remained significant concerns, with only 15.6% of latrines deemed well-maintained. Poor maintenance and hygiene can discourage utilization, posing public health risks as noted by (Omer, 2022).

### 4.8.3 Latrine Utilization

Despite the ownership gap, 100% of respondents reported using a latrine, with 45.3% relying on neighbors' facilities. This demonstrates high awareness on the benefits of latrine use but also highlights the reliance on shared facilities.

Similar trends were observed in studies in Tanzania, where 68.4% of households used latrines, including shared facilities, (Belachew, 2018). Cleanliness was a significant motivator, with 64.1% using latrines to maintain hygiene, echoing findings from (Afework, 2022). However, shared latrine use may compromise privacy and lead to overcrowding, reinforcing the need for more household-level facilities.

### 4.8.4 Knowledge and Awareness

Knowledge on the benefits of latrine utilization was high, with 81.3% rating it as very important for a healthy environment. Educational campaigns, although occasional (70.3%), contributed to this awareness. Studies such as those by (Addis, 2022) also emphasize the role of community-based education in improving sanitation practices. However, the irregularity of campaigns may limit sustained behavior change, suggesting a need for consistent and culturally tailored outreach.

### 4.8.5 Factors Influencing Availability and Utilization

Age, economic status and occupation were significant factors influencing latrine availability with p values 0.033, 0.025 and 0.020 respectively. Younger households were less likely to own latrines. Households in the lower economic class were less likely to own latrines, consistent with findings by (Nyanza, 2018). Occupation status also played a role, with working participants more likely to afford and maintain sanitation facilities. These findings highlight the intersection of socio-economic factors with sanitation outcomes and align with regional studies highlighting socio-economic factors as key determinants of sanitation outcomes (Belachew, 2018). Surprisingly, the study did not find a significant association between education level and latrine availability, diverging from other research where higher education levels often correlate with better sanitation practices, (Asnake, 2020).



#### 4.8.6 Implications of Findings

The findings underscore the complex interplay of demographic, economic, and behavioral factors influencing latrine availability and utilization. The reliance on neighbors' facilities, poor maintenance, and occasional educational campaigns point to systemic challenges requiring multi-sectoral interventions. Integrating sanitation initiatives with economic empowerment programs could address affordability barriers. Additionally, leveraging local leaders in regular educational campaigns could enhance community buy-in and sustain behavior change.

#### 4.8.7 Comparison with Literature

The study's results align with global and regional trends but also highlight unique challenges in Chinseu Village. For instance, while global efforts have reduced open defecation, the study area's reliance on shared facilities mirrors findings from other Sub-Saharan African countries (Belay, 2022). However, the lower ownership rate compared to regions like Southern Ethiopia underscores the need for targeted interventions addressing local socio-economic realities.

### 5. Conclusions and Recommendations

#### 5.1 Conclusion

Latrine ownership is low, with only 54.7% of households owning latrines. However, utilization is high, as 45.3% of households rely on shared facilities. Socio-economic factors, including age, economic status, and occupation, significantly affect latrine availability and utilization. Younger households and those with lower income or without formal employment are less likely to own latrines.

#### 5.2 Recommendation

Implement community-led initiatives to improve access to affordable sanitation facilities and promote household-level ownership through financial incentives.

2. Address economic barriers by subsidizing latrine construction and integrating sanitation programs with local economic development initiatives.
3. Develop targeted interventions focusing on vulnerable groups, such as youth and low-income families, to improve latrine availability and accessibility.
4. Increase community participation in sanitation planning and awareness campaigns.
5. Provide financial assistance to low-income households.

6. Train local artisans to construct and maintain durable latrines.

7. Advocate for policies incentivizing latrine ownership and use.

7. Conduct longitudinal studies to evaluate the impact of sanitation interventions over time.

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