

FACTORS INFLUENCING HOUSEHOLD TOILET OWNERSHIP IN THE WORKING AREA OF SIPIONGOT COMMUNITY HEALTH CENTER, NORTH PADANG LAWAS REGENCY

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Abstract

Household latrine ownership is an important indicator of environmental sanitation and plays a significant role in preventing environmentally related diseases. In the working area of the Sipiongot Community Health Center, North Padang Lawas Regency, some households still do not have healthy latrines, and open defecation practices remain a concern. This study aimed to analyze the factors influencing household latrine ownership. This study employed a quantitative approach with a cross-sectional design. The study population consisted of all heads of households in the working area of the Sipiongot Community Health Center. A total of 95 respondents were selected using purposive sampling. Data were analyzed using univariate analysis, the Chi-Square test for bivariate analysis, and logistic regression for multivariate analysis. The results showed significant associations between household latrine ownership and educational level ($p=0.000$), income level ($p=0.033$), knowledge ($p=0.000$), attitude ($p=0.000$), and socio-cultural factors ($p=0.000$). However, health worker support ($p=0.401$) and village government support ($p=0.107$) were not significantly associated with household latrine ownership. Multivariate analysis showed that income level was the most dominant factor, with an odds ratio (OR) of 80.695, followed by attitude (OR=43.982), knowledge (OR=4.717), and educational level (OR=3.452). Educational level, income, knowledge, attitude, and socio-cultural factors were significantly associated with household latrine ownership. Household income was the most dominant factor influencing latrine ownership. Strengthening environmental health education, community empowerment, and community-based sanitation programs is recommended to improve household ownership of healthy latrines.

Keywords: Household Latrine Ownership, Sanitation, Income, Knowledge, Attitude, Environmental Health

Introduction

Access to adequate sanitation is an essential component of public health and environmental health. Household latrine ownership is an important indicator of sanitation conditions and plays a significant role in preventing environmentally related diseases. Inadequate sanitation and open defecation can contaminate soil and water sources and increase the risk of fecal-oral disease transmission. In 2024, approximately 3.4 billion people worldwide still lacked safely managed sanitation services, including 354 million people who continued to practice open defecation ^[1]. Poor sanitation is associated with diarrheal diseases, intestinal parasitic infections, malnutrition, and other adverse health outcomes ^[2].

In Indonesia, sanitation remains an important public health challenge. National health data indicate that access to adequate sanitation and proper defecation practices vary across regions. These

disparities are particularly evident in rural and low-resource communities, where households may face limitations in accessing adequate sanitation facilities. The Indonesian Ministry of Health continues to promote Community-Based Total Sanitation (Sanitasi Total Berbasis Masyarakat/STBM) as a major strategy for improving sanitation behavior and eliminating open defecation ^[3]. According to the Indonesia Health Profile, the implementation of STBM has continued to expand, although substantial disparities remain between provinces and regions ^[3].

Household latrine ownership is influenced by multiple factors and cannot be explained solely by the availability of sanitation infrastructure. Behavioral, socioeconomic, cultural, and environmental factors may influence household decisions to construct, own, and use healthy latrines. From a behavioral perspective, health behavior is influenced by individual knowledge, attitudes, enabling factors, and social support ^[4,5]. The perception of sanitation as an important household need may therefore influence the willingness of families to invest in and maintain appropriate sanitation facilities.

Socioeconomic characteristics, particularly household income and educational level, are important factors that may affect household latrine ownership. Families with limited financial resources may prioritize food, housing, education, and other basic needs over the construction or improvement of sanitation facilities. In contrast, households with better economic conditions may have greater capacity to provide healthy latrines. Educational attainment may also influence the ability of individuals to obtain, understand, and apply health information related to sanitation ^[4,5].

Knowledge and attitudes are also important determinants of sanitation behavior. Adequate knowledge regarding the benefits of healthy latrines and the health risks associated with open defecation may increase awareness and encourage families to adopt appropriate sanitation practices. Positive attitudes toward healthy latrine ownership and use may further strengthen the willingness to change sanitation behavior. A review of studies conducted in Indonesia found that attitude, knowledge, household income, education, and the role of health workers were among the factors associated with household latrine ownership ^[6].

Sociocultural factors may also influence household sanitation practices. Open defecation can become an established behavior through repeated practices and social norms within communities. In some rural communities, defecating in rivers, gardens, fields, or other open spaces may be perceived as a normal practice. Consequently, sanitation interventions should consider local values, traditions, social norms, and community perceptions in addition to providing physical sanitation facilities ^[4,5].

External support is another factor that may contribute to improved household sanitation. Health workers play an important role in providing health education, counseling, community mobilization, and sanitation promotion through STBM activities. Village governments can also support sanitation improvement through policies, community empowerment, allocation of village resources, and implementation of sanitation programs. Previous research has indicated that the role of health workers and community-level support may contribute to household sanitation behavior, although the strength of these relationships may vary across settings ^[6].

The health consequences of inadequate sanitation make household latrine ownership an important environmental health issue. Human feces disposed of in open areas can contaminate the surrounding environment and facilitate the transmission of pathogens. Improving sanitation therefore requires not only the provision of physical facilities but also sustained changes in household knowledge, attitudes, socioeconomic capacity, and community norms ^[1,2].

In the working area of the Sipiongot Community Health Center, North Padang Lawas Regency, household latrine ownership remains an environmental health concern. Based on preliminary observations, some households still do not have healthy latrines and continue to practice open defecation in gardens, rivers, or areas surrounding their homes. The Sipiongot Community Health Center has implemented promotive and preventive activities through the STBM program, including health education and community triggering activities aimed at encouraging households to stop open

defecation. Nevertheless, the continued presence of households without healthy latrines indicates that sanitation improvement efforts have not yet achieved optimal results.

Previous studies have demonstrated that household latrine ownership is associated with various socioeconomic, behavioral, and social factors. However, the relative contribution of these factors may differ according to the socioeconomic, cultural, and environmental characteristics of each community. A study reviewing evidence from Indonesia identified attitude, knowledge, household income, educational level, and the role of health practitioners as important factors related to household latrine ownership ^[7]. Therefore, further research is needed to identify the factors that influence household latrine ownership in specific local settings.

Based on these considerations, this study aimed to analyze the factors influencing household latrine ownership in the working area of the Sipiongot Community Health Center, North Padang Lawas Regency. Specifically, the study examined the relationships of educational level, household income, knowledge, attitude, sociocultural factors, health worker support, and village government support with household latrine ownership. The findings are expected to provide evidence for strengthening environmental health education, community empowerment, and community-based sanitation programs in North Padang Lawas Regency.

Methods

This study employed a quantitative analytical observational design with a cross-sectional approach. The study was conducted in the working area of the Sipiongot Community Health Center, North Padang Lawas Regency, North Sumatra, Indonesia, from November 2025 to June 2026. The study population consisted of 1,984 households. A total of 95 respondents were selected using purposive sampling based on predetermined inclusion and exclusion criteria. Data were collected through structured questionnaires and documentation of relevant health and sanitation data from the Community Health Center. The variables examined included educational level, household income, knowledge, attitude, sociocultural factors, health worker support, village government support, and household latrine ownership.

Data were analyzed using univariate, bivariate, and multivariate analyses. The Chi-Square test was used to examine the association between independent variables and household latrine ownership, while binary logistic regression was used to identify the most dominant factor. Statistical significance was determined at $p < 0.05$, and the strength of association was presented as an odds ratio (OR) with a 95% confidence interval ^[8,9,10].

Result

Table 1. Characteristics of Respondents and Study Variables (n = 95)

Variables	Category	n	%
Age (years)	20–35	17	17.9
	36–45	33	34.7
	≥46	45	47.4
Age (years)	20–35	17	17.9
	36–45	33	34.7
Sex	Female	19	20.0
	Male	76	80.0
Education	Primary–Senior High School	66	69.5
	Diploma/Bachelor/Master	29	30.5
Income	≤ Regional Minimum Wage	59	62.1
	> Regional Minimum Wage	36	37.9
Occupation	Housewife	2	2.1
	Farmer/Plantation Worker	89	93.7
	Civil Servant	4	4.2
Knowledge	Poor	43	45.3
	Good	52	54.7
Attitude	Negative	42	44.1
	Positive	53	55.9
Sociocultural Factors	Unsupportive	50	52.6
	Supportive	45	47.4
Health Worker Support	Unsupportive	53	55.8
	Supportive	42	44.2
Village Government Support	Unsupportive	60	63.2
	Supportive	35	36.8
Household Latrine Ownership	No	50	52.6
	Yes	45	47.4

A total of 95 respondents participated in the study. Most respondents were aged ≥46 years (47.4%), male (80.0%), had primary to senior high school education (69.5%), and had household income at or below the regional minimum wage (62.1%). The majority worked as farmers or plantation workers (93.7%). More than half had good knowledge (54.7%) and a positive attitude (55.9%), while 52.6% reported unsupportive sociocultural conditions, 55.8% reported inadequate health worker support, and 63.2% reported inadequate village government support. Overall, 52.6% of households did not own a latrine, while 47.4% owned one.

Table 2. Association Between Independent Variables and Household Latrine Ownership

Variable	Category	No Latrine (%)	Latrine n (%)	p-value
Education	Primary–Senior High School	-	-	<0.001
	Diploma/Bachelor/Master	-	-	
Income	≤ Regional Minimum Wage	49 (83.1)	10 (16.9)	<0.001
	> Regional Minimum Wage	1 (2.8)	35 (97.2)	
Knowledge	Poor	33 (76.7)	10 (23.3)	<0.001
	Good	17 (32.7)	35 (67.3)	
Attitude	Negative	40 (95.2)	2 (4.8)	<0.001
	Positive	10 (18.9)	43 (81.1)	
Sociocultural Factors	Unsupportive	35 (70.0)	15 (30.0)	<0.001
	Supportive	15 (33.3)	30 (66.7)	
Health Worker Support	Unsupportive	29 (54.7)	24 (45.3)	0.401
	Supportive	21 (50.0)	21 (50.0)	
Village Government Support	Unsupportive	35 (58.3)	25 (41.7)	0.107
	Supportive	15 (42.9)	20 (57.1)	

Chi-square test; $p < 0.05$ indicates statistical significance.

Table 3. Multivariate Logistic Regression Analysis of Factors Associated with Household Latrine Ownership

Variable	B	Wald	p-value	Exp(B) / OR
Education	1.24	1.047	0.306	3.452
Income	4.39	9.655	0.002	80.695
Knowledge	1.55	2.168	0.141	4.717
Attitude	3.78	9.036	0.003	43.982
Sociocultural Factor	-0.44	0.155	0.694	0.647

Binary logistic regression. Variables with $p < 0.05$ were considered statistically significant. OR = odds ratio.

Discussion

Household Latrine Ownership

This study found that only 47.4% of households owned a latrine, while 52.6% did not. This finding indicates that household sanitation remains an important public health issue in the working area of Sipiongot Community Health Center. Lack of household latrine ownership may increase the likelihood of open defecation and environmental contamination, thereby increasing the risk of fecal-oral disease transmission. The World Health Organization emphasizes that inadequate sanitation is associated with diarrheal diseases, intestinal worm infections, malnutrition, and other adverse health outcomes ^[11]. Globally, 3.4 billion people still lacked safely managed sanitation services in 2024, including 354 million people who practiced open defecation ^[12].

The relatively low proportion of household latrine ownership in this study may reflect the interaction between economic capacity, knowledge, attitudes, and sociocultural conditions. In rural areas, households may prioritize expenditures for food and other essential needs over sanitation facilities, particularly when latrine construction requires relatively high initial costs. Therefore, improving sanitation coverage requires not only health education but also interventions that address household economic barriers and strengthen community participation.

Association Between Education and Household Latrine Ownership

The bivariate analysis showed a significant association between education and household latrine ownership ($p < 0.001$). Education can influence an individual's ability to obtain, understand, and apply health information. Households with higher educational attainment may be more likely to recognize the health risks associated with open defecation and understand the importance of using a safe and hygienic latrine.

This finding is consistent with previous research in Indonesia showing a significant relationship between education and latrine-related behavior. Laika and Adriyani reported that education was significantly associated with low latrine use among households in Surabaya ($p = 0.000$)^[13]. A review of studies on household latrine ownership in Indonesia also identified education as one of the factors associated with latrine ownership^[14].

However, education was no longer statistically significant in the multivariate analysis ($p = 0.306$; OR=3.452). This suggests that the apparent effect of education at the bivariate level may be influenced by other variables, particularly household income and attitude. Thus, increasing educational attainment alone may not be sufficient to increase latrine ownership if households continue to face economic constraints or have unfavorable sanitation attitudes.

Association Between Household Income and Latrine Ownership

Household income was significantly associated with latrine ownership in the bivariate analysis ($p < 0.001$). Among households with income above the regional minimum wage, 35 of 36 households (97.2%) owned a latrine, whereas only 10 of 59 households (16.9%) with income at or below the regional minimum wage owned a latrine. This substantial difference indicates that economic capacity is an important determinant of household sanitation.

The finding is consistent with previous studies in Indonesia. Laika and Adriyani found a significant relationship between income and latrine-related behavior ($p = 0.000$)^[13]. Similarly, Suryani et al., through a review of Indonesian studies, identified family income as one of the important factors related to household latrine ownership^[14]. Other research has also demonstrated an association between income and ownership of healthy latrines^[15].

In the multivariate analysis, income remained statistically significant ($p = 0.002$) and had the largest odds ratio (OR=80.695). This indicates that income was the most dominant factor in the final model. The finding suggests that households with greater economic resources have substantially greater capacity to construct and maintain a household latrine. Nevertheless, the magnitude of the OR should be interpreted according to the coding of the outcome and predictor variables in the regression model.

The strong role of income is understandable because latrine ownership requires financial resources for construction, septic tanks or other safe excreta-disposal systems, water supply, and maintenance. Consequently, sanitation programs in areas with low household income should consider financial or material support, community-based sanitation financing, and affordable latrine technologies rather than relying solely on health promotion.

Association Between Knowledge and Latrine Ownership

Knowledge was significantly associated with household latrine ownership in the bivariate analysis ($p < 0.001$). Among respondents with poor knowledge, only 10 of 43 households (23.3%) owned a latrine, compared with 35 of 52 households (67.3%) among those with good knowledge. This pattern suggests that knowledge about the health risks of open defecation and the benefits of safe sanitation may contribute to household decisions regarding latrine ownership.

This finding is supported by previous research. Suryani et al. identified knowledge as one of the important factors associated with household latrine ownership in Indonesia ^[4]. Laika and Adriyani also found a significant relationship between knowledge and latrine-related behavior ($p=0.006$) ^[13].

However, knowledge was not statistically significant in the multivariate model ($p=0.141$; $OR=4.717$). This indicates that the effect of knowledge may overlap with other factors, particularly income and attitude. Knowledge may increase awareness, but awareness does not necessarily result in latrine construction when households lack the financial resources or motivation to act. Therefore, sanitation education should be combined with interventions that facilitate access to affordable sanitation facilities.

Association Between Attitude and Latrine Ownership

Attitude demonstrated a significant association with household latrine ownership in the bivariate analysis ($p<0.001$). Among respondents with a negative attitude, 40 of 42 households (95.2%) did not own a latrine. In contrast, 43 of 53 households (81.1%) with a positive attitude owned a latrine. This finding indicates that household perceptions, beliefs, and willingness to adopt healthy sanitation practices may influence decisions concerning latrine ownership.

The finding is consistent with the review by Suryani et al., which reported that attitude was significantly related to ownership of healthy household latrines and identified attitude as one of the important factors in Indonesia ^[4]. Similarly, previous research in Surabaya demonstrated a significant relationship between attitude and latrine-related behavior ($p=0.003$) ^[13].

Importantly, attitude remained significant in the multivariate analysis ($p=0.003$; $OR=43.982$). This demonstrates that attitude was an independent factor associated with latrine ownership after controlling for education, income, knowledge, and sociocultural factors. A positive sanitation attitude may increase the likelihood that households perceive latrine construction as a necessary investment rather than an optional household facility.

This finding has important implications for health promotion programs. Interventions should not only provide information but also address perceptions, beliefs, perceived benefits, and barriers related to latrine ownership. Community-based discussions, demonstrations of affordable latrine models, testimonials from households that have adopted healthy sanitation practices, and involvement of community leaders may help strengthen positive sanitation attitudes.

Association Between Sociocultural Factors and Latrine Ownership

Sociocultural factors were significantly associated with latrine ownership in the bivariate analysis ($p<0.001$). Among households with unsupportive sociocultural conditions, 35 of 50 households (70.0%) did not own a latrine. In contrast, among households with supportive sociocultural conditions, 30 of 45 households (66.7%) owned a latrine.

This finding suggests that sanitation behavior is influenced not only by individual knowledge and economic resources but also by social norms, family practices, community expectations, and local perceptions regarding defecation and household sanitation. In communities where open defecation has historically been accepted or considered normal, households may have less motivation to construct a private latrine.

Nevertheless, sociocultural factors were not statistically significant in the multivariate model ($p=0.694$; $OR=0.647$). This suggests that the observed bivariate association may be explained partly by other variables, particularly income and attitude. Sociocultural interventions should therefore be integrated with economic and behavioral strategies rather than implemented independently.

Health Worker Support and Latrine Ownership

Health worker support was not significantly associated with household latrine ownership ($p=0.401$). Although health workers play an important role in providing sanitation education and promoting healthy behaviors, their support alone may not be sufficient to overcome economic and behavioral barriers to latrine construction.

This finding is noteworthy because previous literature has identified the role of health practitioners as one factor potentially related to household latrine ownership^[14]. The difference may be explained by variations in the intensity, frequency, and type of health-worker intervention across communities. Health education may be less effective when households understand the importance of sanitation but cannot afford to construct a latrine.

Therefore, health workers should adopt a more comprehensive approach that combines education with household assessment, identification of barriers, community mobilization, and referral to sanitation-support programs.

Village Government Support and Latrine Ownership

Village government support was also not significantly associated with household latrine ownership ($p=0.107$). Although households reporting supportive village government involvement showed a somewhat higher proportion of latrine ownership than those reporting unsupportive support, the difference was not statistically significant.

This finding may indicate that existing village-level sanitation support has not yet been sufficiently targeted or intensive to influence household latrine ownership. Government support may include sanitation campaigns, facilitation, regulations, or infrastructure programs; however, the effectiveness of these interventions depends on their accessibility, continuity, and implementation at the household level^[15,16].

Strengthening village government involvement may therefore require specific sanitation targets, community-based financing mechanisms, monitoring of open defecation, and collaboration between village authorities, community health centers, cadres, and community leaders.

Conclusion

The multivariate analysis identified household income and attitude as the factors that remained significantly associated with household latrine ownership. Income had the highest odds ratio ($OR=80.695$; $p=0.002$), followed by attitude ($OR=43.982$; $p=0.003$). These findings indicate that economic capacity and behavioral disposition are particularly important in determining household sanitation decisions in the study area.

The results support the concept that sanitation behavior is multidimensional. WHO emphasizes that sanitation improvement requires more than simply providing infrastructure; sustainable sanitation also depends on appropriate use, safe disposal of excreta, and cessation of open defecation [6]. Thus, interventions in the working area of Sipiongot Community Health Center should combine economic facilitation with behavior-change strategies.

From a public health perspective, the findings suggest that sanitation programs should prioritize low-income households while simultaneously strengthening positive sanitation attitudes. The provision of affordable latrine options, financial assistance or community financing, sanitation education, household counseling, and community-based behavior-change activities may be more effective than relying on a single intervention. Such an integrated approach is important to accelerate progress toward universal access to safe sanitation and reduce the health risks associated with inadequate sanitation.

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