



ANALYSIS OF SOCIO-DEMOGRAPHIC FACTORS INFLUENCING FAMILY LATRINE UTILIZATION BEHAVIOUR

Erna Hartatik¹, Rondhianto^{2*}, Dina Helianti³

¹Master of Public Health Sciences Postgraduate Program, Universitas Jember, Indonesia

²Faculty of Nursing, Universitas Jember, Indonesia

³Faculty of Medicine, Universitas Jember

ABSTRACT

***Corresponding Author:**

Rondhianto

Faculty of Nursing, Universitas Jember,
Indonesia

rondhianto@unej.ac.id

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Providing healthy latrines for each family is an effort to reduce open defecation (OD). However, there are still many people who do not use family latrines for defecation, which can increase the risk of fecal-oral transmission of disease. Many factors influence OD behavior, one of which is socio-demographic. To analyze socio-demographic factors' influence on family latrine utilization behavior. Observational analytic with a cross-sectional design. The sample size was 138 respondents using the cluster random sampling technique. Data were collected using a questionnaire (family latrine utilization behavior and socio-demographic) and analyzed using multiple logistic regression and difference tests. Most respondents were 41 - 60 years old (73.2%), women (57.3%), moderate education (55.8%), with family members less than four people (81.88%), and all respondents had income level less than regency minimum wage (100%). Most respondents had family latrine utilization behavior (FLUB) in the high category (66.7%). The modeling test showed the model fit ($p=0.034$; $R^2=0.162$). It showed that age, gender, education, income and number of family members simultaneously significantly affect FLUB by 16.2%. However, partially, only the educational factor had a significant effect ($p=0.001$). In addition, the mean difference test shows significant differences in FLUB based on education level ($p=0.001$). The socio-demographic factor that significantly influences FLUB is the education level. Health workers should consider people's education level in health promotion efforts to increase FLUB and reduce OD behavior. Further study can be carried out by analyzing other factors, such as psychosocial, which may also influence FLUB.

Keywords:

Behavior, Family latrine utilization, Open defecation, Socio-demographics

BACKGROUND

Open defecation is one of the causes of health problems. Globally, using latrines as a means of elimination is still not optimal; one in three people does not have access to proper sanitation, and one in seven people still practice open defecation (Wolf et al., 2019). It impacts health, especially in children, such as diarrhea and contributes to an increased risk of premature death (Mara, 2017; Spears, 2020a). In 2018, over 340,000 children under five died due to unhygienic sanitation and water (World Health Organization, 2017). UNICEF and WHO study results also stated that more than 370 Indonesian toddlers died from bad behavior in open defecating (Hayana et al., 2020). Situbondo Regency is the second highest district in East Java Province, with the number of open defecation rates. Based on data collected by the East Java Provincial Health Service regarding the achievements of open defecation-free districts, better known as open defecation-free (ODF), East Java Province. In December 2021, there were 18 districts/cities where open defecation. It is a big challenge for East Java Province and regencies/cities in East Java with open defecation status to achieve the East Java Province target of 100% ODF in 2024 (Dinas Kesehatan Jawa Timur, 2021). Based on LB1 data, the February 2022 Situbondo District Health Service progress report on latrine access stated that there were 83 villages (61%) out of 136 villages/districts that were ODF, while the remaining 53 villages (39%) still open defecation (OD). Some households have latrines but defecate in the open area (Dinas Kesehatan Kabupaten Situbondo, 2022). Despite the efforts made by the Situbondo Regency government to achieve 100% ODF status by 2024, this is undoubtedly a challenge.

The high level of this problem is due to the need for more individual awareness of the importance of implementing clean and healthy living behavior, including defecation in appropriate infrastructure (Yulyani et al., 2019). Previous studies showed that access to latrine facilities does not guarantee avoiding open defecation practices (Co?ey & Spears, 2014; Tesfaye et al., 2018; dan Biswas et al., 2020). The problem of families still practicing open defecation is not limited to the lack of infrastructure, namely toilets and the provision of clean water, but more to the behavioral aspect, namely community behavior that does not compromise on clean and healthy living behavior (Nurlatif et al., 2019). Healthy latrines are benchmarks in the Clean and Healthy Living Behavior Indicators (Nadrati et al., 2019; Wahyu & Eka,

2019). A healthy toilet is also an indicator of a person's clean environment, reflecting how they are used to having a clean environment (Faidah, 2018; Suning et al., 2018). Previous studies state that good sanitation in latrines will affect a person's health (Temesgen et al., 2021; Linggar et al., 2019). Previous studies state that good sanitation in latrines will affect a person's health (Temesgen et al., 2021; Linggar et al., 2019). Appropriate use of latrines can reduce the risk of contracting diarrheal disease, and maximum utilization is achieved when improved sanitation and clean water supplies are combined and hygienic practices (Freeman et al., 2017).

Health behavior is influenced by predisposing factors that facilitate or arise automatically from within the individual regarding age, education, knowledge, gender, economic status, values and perceptions and family size (Temesgen et al., 2021). Age, educational level, and family size are socio-demographic factors that influence a person's behavior in using toilets. A previous study showed that many respondents who used latrines were over 48 years old (Zewdie et al., 2021). The last study stated a significant relationship between gender and their participation in environmental sanitation, with men having a nine times greater chance of participating than women (Ibanga, 2015). Previous studies also stated that the better the community's education, attitudes and culture, the better their behavior in using existing latrines (Carlo & Syah, 2022). There was a relationship between economic status and family behavior in using latrines (Heranita et al., 2019). A family size of more than five had a greater chance of practicing open defecation than respondents with a family size of less than five (Temesgen et al., 2021). It is in line with the results of previous study, which states that the number of family members more than or equal to five is a factor related to latrine use (Zewdie et al., 2021). However, several previous studies stated no significant relationship between socio-demographics and family latrine utilization. The gender difference did not affect latrine use behavior (Selan et al., 2021). The level of education also did not affect family latrine utilization (Apriyanti et al., 2018), and there was no significant relationship between income (Mathofani et al., 2020). Based on the results of previous studies, which showed differences between the results of one study and another. Researchers hypothesize that socio-demographic factors can influence the behavior of using toilets for defecation. Therefore, this study aims to analyze the influence of socio-demographic factors on family latrine utilization behavior in Situbondo Regency.

METHODS

The study design is descriptive-analytic with a cross-sectional approach. The study was conducted in Situbondo Regency in March - December 2022. The population was families who received social assistance from the family latrine program through the 2019 Situbondo Regency APBD funds, namely 500 families from 5 villages, namely Klatakan (60), Dawuhan (264), Patokan (106), Patemon (34), and Kertosari (36). The sample size was 135 respondents calculated using G*Power Software Version 3.1 ($f^2 = 0.15$; $\alpha = 0.05$; and $\beta = 0.8$). G*Power was used to calculate the sample size precisely, where the test used is multiple regression and to avoid type I ($\alpha = 0.05$) and type II ($\beta = 0.8$) errors. The sample inclusion criteria were: (1) families receiving social assistance from the family latrine program through 2019 Situbondo Regency APBD funds; (2) acting as head of the family; (3) able to communicate well; (4) Not currently sick requiring hospitalization; (5) do not have physical or mental limitations that could interfere with the conduct of study (blindness, deafness, dementia, etc.); (6) willing to be a respondent. The sampling technique used was cluster random sampling, namely Klatakan ($n = 16$); Dawuhan ($n = 71$); Patokan ($n = 29$); Patemon ($n = 9$); Kertosari ($n = 10$).

This study has two variables: the independent variable and the dependent variable. The independent variables are socio-demographic factors consisting of age, education, level of knowledge, income level, gender, and number of family members. The dependent variable is the family's latrine utilization behavior. The measuring instrument used in the study was a questionnaire. A socio-demographic questionnaire was used to determine age, gender, education, income and number of family members. The family latrine utilization behavior was measured using a questionnaire adapted from the concept of family health tasks (Friedman et al., 2003), consisting of 14 question items, which include the domains of recognizing diseases caused by OD (2 items), making decisions about using a latrine (3 items), maintaining latrine cleanliness for health (3 items), modifying the environment (3 items), and using latrine facilities (3 items) with a Likert scale of 1 - 5 (1= strongly disagree, 2= disagree, 3= sometimes agree, 4= agree and 5= strongly agree) so the score range is 14 - 70. The higher the score, the better the family's behavior in using the family latrine. The validity and reliability test of the questionnaire was carried out by researchers in Situbondo regency on people who were not

respondents to this study using a sample of 60 respondents. The validity and reliability test results were $r = 0.353 - 0.685$ ($r_{table} = 0.254$; $n = 60$) with Cronbach alpha = 0.811. Family latrine utilization behavior was categorized into poor (< 32.67), moderate ($32.67 - < 51.33$), and good (≥ 51.33).

Data was collected by interviewing respondents directly at the respondent's home. Before data collection, the researcher explained the aims, benefits, procedures and possible risks to prospective respondents. After the prospective respondents understood and were willing to become respondents, the researcher asked them to sign a consent form. Data were analyzed using descriptive and inferential analysis using SPSS Version 27. Descriptive analysis used central tendency and dispersion. The inferential analysis used the Multiple Logistic Regression and Difference Test (Kruskal-Wallis and Mann-Whitney U Test). The Ethical Committee of Health Research of the Faculty of Dentistry, Jember University, approved the study with protocol number 1665/UN25.8/KEPK/DL/2022.

RESULTS

The study results showed that the average age of respondents in this study was 47.79 years, and the most were in the age range 41 - 60 years (73.20%). In addition, most respondents were women (57.20%), had a middle-level education (55.80%), had an income of less than the regency minimum wage (RMW) (100%) and had less than four family members (81.90%) (Table 1).

Most of the respondents had family latrine usage behavior in the high category (76.81%), with the highest sub-variable being the indicator of deciding to use latrines (13.19 ± 1.38 , 95% CI = 12.96 - 13.42) (Table 2).

Respondents who had a high average family latrine utilization behavior were in the 18 - 40 years age group (59.03 ± 5.59 ; 95% CI = 56.9 - 61.16), Male (57.29 ± 5.49 ; 95% CI = 55.86 - 58.72), middle education (58.78 ± 4.99 ; CI 95% = 57.65 - 59.91), income level less than the minimum wage (56.39 ± 5.78 ; CI 95% = 55.41 - 57.36) and number of family members < 4 people (57.04 ± 5.37 ; CI 95% = 54.82 - 59.26). The result of the normality test for the family latrine utilization behavior showed that the data was not normally distributed ($p = 0.002 < \alpha = 0.05$) (Table 3).

Based on Table 3. The Mann-Whitney U test showed that male respondents had a higher average rating of family latrine utilization behavior (75.97%) than female respondents. Likewise, respondents with

Table 1. Characteristics of Respondents

Variable	n	%	Mean±SD (Min-Max)
Age (years)			
18 – 40	29	21.10	47.79±8.91 (23 – 74)
41 – 60	101	73.20	
61	8	5.80	
Gender			
Female	79	57.20	
Male	59	42.80	
Education level			
No school	9	6.50	
Basic	52	37.70	
Middle	77	55.8	
High	0	0	
Income level			
RMW	100	100	
> RMW	0	0	
Number of family members			
4 people	113	81.90	
> 4 people	25	18.10	

Table 2. Family Latrine Utilization Behavior in Situbondo Regency

Variable	n (%)	Mean±SD (CI 95%)	Normality Test (p-Value)
Family Latrine Utilization Behaviour			
Poor	0 (0)	56.38±5.78 (55.41 – 57.36)	0.002
Moderate	32 (23.19)		
Good	106 (76.81)		
Sub variable			
Knowing diseases caused by ODF		7.93±1.21(7.72 – 8.13)	
Decide to use a healthy latrine		13.19±1.38 (12.96 – 13.42)	
Maintain the cleanliness of the family latrines		12.57±2.03 (12.22 – 12.91)	
Modify the environment		10.11±1.36 (9.87 – 10.34)	
Using family-healthy latrine infrastructure		12.59±1.63 (12.32 – 12.87)	

Table 3. Contingency Table and Analysis of Different Tests of Family Toilet Utilization Behavior

No	Variable	Family Latrine Utilization Behaviour				Mean±SD (CI 95%)	Kruskal-Wallis Test or Mann-Whitney U Test	Mean rank	p-Value
		Poor n (%)	Moderate n (%)	Good n (%)	Total n (%)				
1.	Age (years)								
	18 – 40	0 (0)	3 (10.35)	26 (89.65)	29 (100)	59.03±5.59 (56.91 – 61.16)	86.43	0.002	
	41 – 60	0 (0)	24 (23.76)	77 (76.24)	101 (100)	56.05±5.57 (54.95 – 57.15)	67.67		
	≥ 61	0 (0)	5 (62.50)	3 (37.50)	8 (100)	51.00±4.54 (47.21 – 54.79)	31.25		
2.	Gender								
	Female	0 (0)	21 (26.58)	58 (73.42)	79 (100)	55.71±5.93 (54.38 – 57.04)	64.67	0.100	
	Male	0 (0)	11 (18.64)	48 (81.36)	59 (100)	57.29±5.49 (55.86 – 58.72)	75.97		
3.	Education level								
	No school	0 (0)	6 (66.67)	3 (33.33)	9 (100)	50.11±4.76 (46.46 – 53.77)	27.17	0.001	
	Basic	0 (0)	20 (38.46)	32 (61.54)	52 (100)	53.92±5.22 (52.47 – 55.38)	51.34		
	Middle	0 (0)	6 (7.80)	71 (92.20)	77 (100)	58.78±4.99 (57.65 – 59.91)	86.71		
	High	0 (0)	0 (0)	0 (0)	0 (0)	-	0		
4.	Income level								
	≤ RMW	0 (0)	32 (23.19)	106 (76.81)	138 (100)	56.39±5.78 (55.41 – 57.36)	69.50	1.000	
	> RMW	0 (0)	0 (0)	0 (0)	0 (0)	-			
5.	Number of family members								
	≤ 4 people	0 (0)	27 (23.89)	86 (76.11)	113 (100)	57.04±5.37 (54.82 – 59.26)	68.74	0.636	
	> 4 people	0 (0)	5 (20)	20 (80)	25 (100)	56.24±5.87 (55.14 – 57.33)	72.92		

Table 4. Analysis of the Influence of Family Toilet Utilization

Variable	The goodness of fit test		Pseudo R ²	Parameter Estimates				
	X ²	p		Estimate	SE	Wald	p	
Threshold	Family Latrine Utilization Behavior (=1)	45.625	0.034	0.162	-4.547	1.473	9.535	0.002
	Family Latrine Utilization Behavior (=2)				-1.541	1.380	1.247	0.264
Location	Age (=1)				-0.446	1.329	0.113	0.737
	Age (=2)				-0.195	1.244	0.024	0.876
	Age (=3)				0 ^a	-	-	-
	Gender (=1)				0.204	0.392	0.270	0.603
	Gender (=2)				0 ^a	-	-	-
	Education (=1)				-2.246	1.219	3.395	0.065
	Education (=2)				-1.498	0.412	13.237	0.001
	Education (=3)				0 ^a	-	-	-
	Income (=1)				0 ^a	-	-	-
	Number of family members (=1)				0.119	0.506	0.055	0.815
	Number of family members (=2)				0 ^a	-	-	-

Link function: Logit

a. This parameter is set to zero because it is redundant.

income below the minimum wage had a higher average rating of family latrine utilization behavior (69.50) than those above the minimum wage. However, there was an insignificant influence between family latrine

utilization behavior based on income level and gender (p = 1.000, p = 0.100 > alfa = 0.05). Based on the Kruskal-Wallis test (Table 3), the results showed that respondents in the 18-40 year category had a higher

average rating of family latrine utilization behavior (86.43%) than other age categories. In addition, respondents with secondary education levels had a higher average rating of family latrine utilization behavior (86.71%) than different education levels. Respondents with family members of 5-6 people had a higher average rating of family latrine utilization behavior (72.92%) compared to those with other family members. However, there is an insignificant influence between family latrine utilization behavior based on the number of family members ($p = 0.636 > \alpha = 0.05$). There is a significant influence between family latrine utilization behavior based on age and education level ($p = 0.002$, $p = 0.001 < \alpha = 0.05$).

Based on the multiple ordinal logistic regression test, the results showed that only the education level indicator had a significant influence on family latrine utilization behavior ($p = 0.001 < \alpha = 0.05$) with a predominance in the secondary education age range (Table 4).

DISCUSSION

The study results showed that most respondents are 41-60 years old, with an average age of 47.79 years, female with a middle education level. Apart from that, most respondents had low socio-economic status with incomes below the minimum wage and had family members of less than four people in one residence (Table 1). The results of this study follow a previous study, which stated that age, educational status, and family size influence behavior in using toilets. In fact, from this study, it was also found that the respondents who used the latrine the most were over 48 years old (Zewdie et al., 2021). Age 40 to 60 years is the stage of generativity, where a person forms a family and career, is the longest of all stages. So, in that age period, a person begins to mature in deciding the best behavior for his family (The Human Development Teaching & Learning Group, 2021).

The study results showed that most respondents are female (Table 1). This study's results could be because females use latrines more often than men, so females have a greater opportunity to use the available toilets than males. However, the results do not agree with a previous study, which states a significant relationship exists between gender and their participation in environmental sanitation, with men having a nine times greater chance of participating than women (Ibanga, 2015). The study results show that most respondents have a secondary education level (Table 1). The results of this study follow previ-

ous studies, namely that the better the education, attitudes and culture of the community together, the better their behavior in using existing latrines (Ward et al., 2022). The results of this study also agree with another study, which states that there is a relationship between household latrine use and the education level of the head of the household (Leshargie et al., 2018). Other similar studies on the impact of sanitation interventions on latrine coverage suggest that education level influences community latrine use (Garn et al., 2017). Education from an early age must be applied to every individual so that humans are of good quality and do not harm themselves or others, especially when using toilets. So, it is assumed that the higher a person's level of education, the more they can know, understand or analyze clean and healthy living. On the other hand, a higher level of education means a higher understanding of excretion information, especially when using the family latrine (Palupi et al., 2020). However, the results of this study do not agree with the results of the previous study, which stated that education level had an insignificant relationship with family latrine use. (Apriyanti et al., 2018). Another study also noted that the educational status of the respondent (head of household) has little connection with latrine use (Budhathoki et al., 2017).

The study results showed that all respondents were of low socio-economic status (Table 1). This study's results follow a previous study that stated family income level influences latrine use. The better the income level, the better the behavior in using the toilet (Amory, 2019). The study showed that all respondents were of low socio-economic status (Table 1). This study's results follow a previous study that found that family income influences latrine use. The better the income level, the better the behavior. Income level also shows how the family maintains the available toilet facilities. If latrine facilities are well maintained, latrine utilization will also improve (Zewdie et al., 2021). The study results showed that the level of latrine utilization was dominated by families with less than four people (Table 1). This study follows the results of a previous study that stated respondents with a family size of more than five have a greater chance of defecating than respondents with a family size of less than five. (Temesgen et al., 2021). Another study noted that households whose family size is more than or equal to five [AOR: 0.51; 95%CI: 0.32, 0.82] were 49% less likely to use a latrine than households with fewer than five families (Zewdie et al., 2021).

The study results showed that most respondents have family latrine utilization behavior in the

high category (Table 2). This study does not follow the results of the previous study that having latrine facilities does not guarantee to eliminate the practice of open defecation, and even existing latrines still need to be consistently used 100 percent by the community (Sinha et al., 2017) because families are said to consistently use the available latrine facilities when they have used the latrine continuously for one week (Alemu et al., 2018). The study results showed that younger males, those with higher education levels, and fewer family members than four had higher scores of family latrine utilization behavior (Table 3). Based on the Kruskal-Wallis test with a confidence level of 95%, it was concluded that those aged 18-40, with secondary education levels and more than four family members, had a higher average level than others in family latrine utilization behavior (Table 3). Meanwhile, based on the ordinal regression test, only the education level variable has a value of $p=0.001 < \alpha = 0.05$, meaning that the education level significantly affects family latrine utilization behavior (Table 4). Based on the Mann-Whitney U test with a confidence level of 95%, it was concluded that male gender and an income level of less than the minimum wage had a higher average level than others in the behavior of using family toilets (Table 3). Meanwhile, based on the ordinal regression test, no variables significantly affect family latrine utilization behavior (Table 4).

Younger ages have a higher average value of latrine utilization behavior than older ones. This study follows previous studies that there is a strong reason that people learn through their experiences. Besides that, there is another factor, namely that young people have better access to information so that it is possible to get adequate information about the dangers of open defecation behavior on their health (World Health Organization, 2017). This study follows a previous study that stated men have a nine times greater chance of participating than women regarding their participation in environmental sanitation (Ibanga, 2015). Respondents from secondary education levels have a high average value of latrine utilization behavior compared to lower education levels. This study follows a previous study that stated the better the community's education, attitudes and culture, the better their behavior in using existing latrines (Ward et al., 2022). The results of this study also agree with another study, which states that there is a relationship between household latrine use and the education level of the head of the household (Leshargie et al., 2018). The study results show that family members with less than four people have a

higher average value of latrine utilization behavior than other family members (Table 3). Following the results of a previous study, this study found that households with more than five family members are less likely to use a latrine than households with less than five (Zewdie et al., 2021) .

This study had limitations, namely that it only tested the influence of socio-demographic factors on family latrine utilization behavior. Meanwhile, other factors, such as psychosocial factors, were not studied. Future studies can test the effect of these factors, which may influence because, based on the analysis results, the contribution of socio-demographic factors is only 16.2%. So, 83.8% of other factors still influence family latrine utilization behavior. Modeling studies involving many variables can also be carried out in further studies to comprehensively identify factors that influence family latrine utilization behavior.

CONCLUSION

The study results showed that most respondents had latrine utilization behavior in the good category. Respondents with a high latrine utilization behavior score were in the 18-40 year age group, Male, with secondary education, income level less than the minimum wage, and number of family members under 4. The results of the study showed that there was a significant influence on latrine utilization behavior based on level of education. Meanwhile, based on gender, age, income level and number of family members, the effect is not significant. In health promotion efforts to increase family latrine utilization behavior, health workers should consider educational level factors to achieve goals and reduce open defecation behavior.

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