



Knowledge, Attitude and Practices Regarding Sanitary Latrine Utilization Among Households in an Urban Slum of Ratanpar, Surendranagar: A Community-Based Cross-Sectional Study.

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Abstract

Background: Inadequate sanitation and open defecation remain major public health concerns in developing countries, especially in urban slums. Poor disposal of human excreta contributes to enteric infections and negatively affects health, dignity and quality of life. This study was conducted to assess the knowledge, attitude and practices regarding sanitary latrine utilization among households in the urban slum area of Ratanpar, Surendranagar, Gujarat, and to identify socio-demographic factors associated with open defecation. **Methods:** A community-based cross-sectional observational study was conducted among 300 households selected by census method. Data were collected from heads of households regarding sanitation practices, awareness of diseases related to open defecation and socio-demographic characteristics. Appropriate statistical tests were applied. **Results:** Of 300 households, 127 (42.3%) practiced open defecation, 96 (32.0%) used household sanitary latrines and 77 (25.7%) relied on community toilets. Handwashing after defecation was reported by 207 (69.0%) participants, but only 139 (46.3%) used soap. Awareness of diseases transmitted through open defecation was low, with only 69 (23.0%) participants informed. Major reasons for not constructing household latrines were lack of money (41.2%), lack of interest (19.1%) and unawareness of government subsidy schemes (15.2%). Literacy, socioeconomic status, age group, family size and type of house were significantly associated with open defecation, while gender was not. **Conclusion:** Open defecation remained highly prevalent. Low awareness, financial constraints and low literacy were major barriers to sanitary latrine use. Targeted health education, behaviour change communication and improved sanitation infrastructure are needed.

Keywords: Open defecation; Sanitary latrine; Urban slum; Sanitation; Hygiene; KAP study; Swachh Bharat Mission.



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INTRODUCTION

Sanitation is a fundamental determinant of health and an essential component of environmental hygiene. Safe sanitation facilities prevent contamination of the environment by human excreta and interrupt the transmission of enteric pathogens responsible for diarrhoeal diseases, intestinal parasitic infestations, typhoid fever, hepatitis A and other communicable diseases.

The World Health Organization (WHO) recognizes sanitation as a critical public health intervention that contributes not only to disease prevention but also to dignity, safety, education and socioeconomic development.^{1,2}

Globally, inadequate sanitation remains a major public health challenge. Poor sanitation and hygiene practices contribute substantially to the burden of disease, particularly in low- and middle-income countries. Exposure to untreated human excreta through open defecation contaminates water sources, soil and food chains, resulting in increased transmission of communicable diseases.

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Studies have demonstrated that improved sanitation significantly reduces the incidence of diarrhoeal diseases and other sanitation-related illnesses.^{3,4}

India has historically accounted for a large proportion of the global population practicing open defecation. Recognizing the health and social consequences of poor sanitation, the Government of India launched several initiatives, culminating in the Swachh Bharat Mission (SBM), which aimed to eliminate open defecation and improve sanitation coverage throughout the country.

Although substantial progress has been reported nationally, disparities continue to exist among socioeconomically disadvantaged populations, particularly those residing in urban slums.⁵

Urban slums present unique sanitation challenges due to overcrowding, inadequate infrastructure, insecure housing conditions, poverty and limited availability of space for construction of household toilets. Even where sanitation facilities exist, utilization is influenced by behavioural, cultural and socioeconomic factors.

Studies conducted among urban poor populations have consistently shown that access alone does not guarantee usage and that community-level factors strongly influence sanitation behaviour.^{6,7}

The Sustainable Development Goals (SDGs), particularly Goal 6, emphasize universal access to adequate and equitable sanitation and hygiene.⁸ Despite progress under sanitation initiatives in India^{5,6,7} urban slum populations continue to face substantial challenges in sanitation access and utilization.

The urban slum population served by the Ratanpar Urban Health Training Centre (UHTC) represents a vulnerable community with potentially limited access to adequate sanitation facilities. Assessment of knowledge, attitudes and practices (KAP) regarding sanitary latrine utilization is therefore essential for planning effective public health interventions.

Hence, the present study was undertaken to assess the KAP regarding sanitary latrine usage and to identify associated socio-demographic determinants among households in this slum area. This study was conducted to assess the knowledge, attitude and practices regarding sanitary latrine utilization among households residing in an urban slum area of Ratanpar, Surendranagar.

MATERIALS AND METHODS

It is a community-based cross-sectional observational study. Urban slum area of Ratanpar, Surendranagar district, Gujarat was chosen for the study. The study area comprised ten streets with approximately 35 households in each street. A census of all households in the urban slum was conducted. A total of 300 households were included in the study. The head of each selected household was interviewed. Locked houses for consecutive two visits and respondents who refused to give consent were excluded from the study.

Data Collection: Data were collected using a pre-tested structured questionnaire covering socio-demographic characteristics, sanitation practices, hand hygiene practices, attitude towards latrine construction and awareness regarding diseases transmitted through open defecation. Data collection was carried out by trained investigators after obtaining informed consent.

Inclusion Criteria: a) All households residing in the selected urban slum area for at least six months. b) Head of household available and willing to participate during the survey period.

Statistical Analysis: Data were entered and analyzed using appropriate statistical software. Descriptive statistics were calculated for socio-demographic and outcome variables and expressed as frequencies and percentages. Chi-square test was applied to assess associations between socio-demographic variables and open defecation. A p-value less than 0.05 was considered statistically significant.

RESULTS

A total of 300 respondents participated in the study. The majority were females (n=187) compared to males (n=113). The predominant age group was 31–45 years (n=121), followed by those aged 46 years and above (n=90) and those below 30 years (n=89).

Table 1. Socio-demographic Profile of Study Participants (n=300)

Characteristic	Category	Frequency (n=300) n (%)
Gender	Male	113 (37.7%)
	Female	187 (62.3%)
Age Group (years)	18–30	89 (29.7%)
	31–45	121 (40.3%)
	46 and above	90 (30.0%)
Literacy Status	Literate	163 (54.3%)
	Illiterate	137 (45.7%)
Socioeconomic Class (Modified B.G. Prasad)	Class I	15 (5.0%)
	Class II	27 (9.0%)
	Class III	48 (16.0%)
	Class IV	93 (31.0%)
	Class V	117 (39.0%)
Family Size	≤4 members	98 (32.7%)
	5–6 members	127 (42.3%)
	≥7 members	75 (25.0%)
Type of House	Pucca	67 (22.3%)
	Semi-pucca	148 (49.3%)
	Kutchra	85 (28.4%)

Note: Modified B.G. Prasad Scale updated for current Consumer Price Index values.

Regarding literacy, 54.3% respondents were literate and 45.7% were illiterate. Based on the Modified B.G. Prasad Socioeconomic Classification, the majority belonged to Class V (39%) followed by Class IV (31%), indicating that approximately 70% of the study population belonged to the lower two socioeconomic strata. The socio-demographic profile is presented in Table 1.

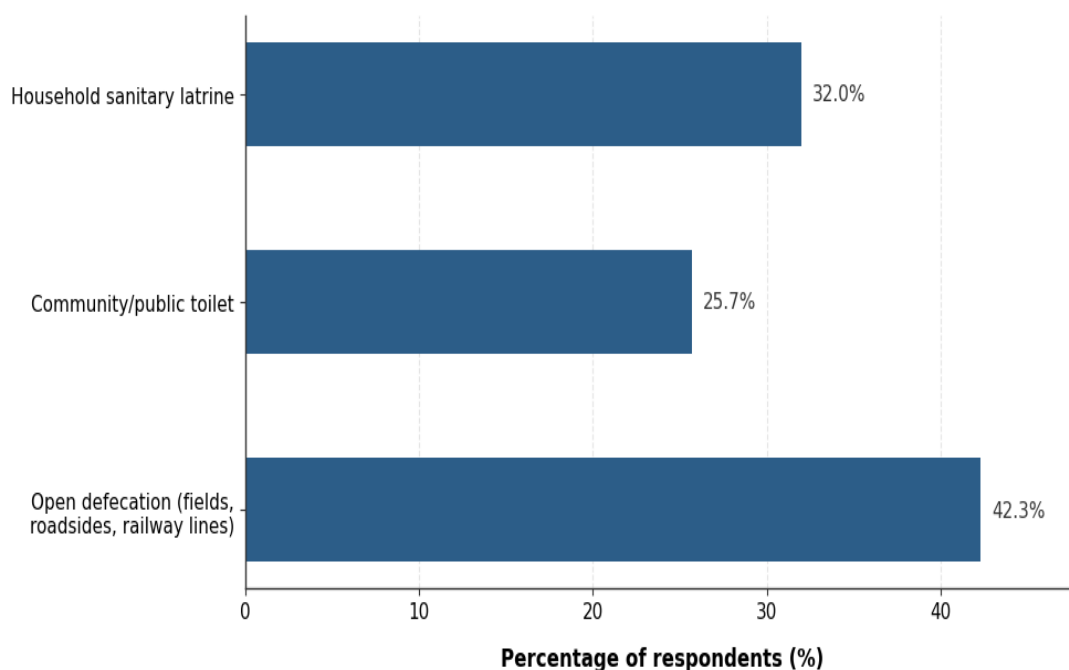


Figure 1. Place of Defecation Among Study Participants (n=300)

Note: Multiple community toilet users cited long wait times and perceived unhygienic conditions as disincentives for consistent use.

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Among the 300 surveyed households, 127 (42.3%) practiced open defecation in fields, roadsides or along railway lines. A total of 96 (32.0%) households used household sanitary latrines, and 77 (25.7%) relied on community or public toilets. The distribution of defecation practices is presented in Figure 1.

Knowledge levels regarding the health hazards of open defecation were notably poor across the study population. Only 23% respondents were aware that open defecation contributes to the spread of diseases, while the remaining 77% lacked this basic awareness. Among those with some awareness, only 18% could identify specific diseases — such as diarrhoea, cholera, typhoid or helminthic infections — associated with open defecation.

A total of 37% respondents had heard of the Swachh Bharat Mission or related government sanitation schemes, though many were unaware of eligibility criteria or subsidy provisions. Only 28% respondents were aware of the correct steps for handwashing as recommended under the WASH framework. Notably, only 14% knew that child faeces are equally, if not more, infectious than adult faeces. These knowledge gaps represent a significant barrier to behaviour change and indicate the need for targeted Information, Education and Communication (IEC) activities. Knowledge parameters are presented in Table 2.

Table 2. Knowledge Regarding Sanitation and Open Defecation Among Study Participants (n=300)

Knowledge Variable	Yes n (%)	No n (%)
Aware that open defecation spreads diseases	69 (23.0%)	231 (77.0%)
Knowledge of specific diseases linked to open defecation	54 (18.0%)	246 (82.0%)
Aware of Swachh Bharat Mission / government sanitation schemes	112 (37.3%)	188 (62.7%)
Aware of correct method of handwashing (WASH steps)	84 (28.0%)	216 (72.0%)
Know that child faeces are as infectious as adult faeces	41 (13.7%)	259 (86.3%)

Despite the low knowledge scores, a moderate proportion of respondents demonstrated positive attitudes towards sanitation. Nearly 61% agreed that a sanitary latrine improves family health, and 68% stated they would use a latrine if one were provided at home, suggesting that access — rather than willingness — is a primary barrier. However, only 50% acknowledged that open defecation is unhygienic and should be actively stopped, implying deeply ingrained behavioural norms among the remaining respondents.

A considerable 59% respondents expressed willingness to avail government schemes for latrine construction, reflecting an encouraging disposition towards programme participation. Importantly, 67% respondents perceived community toilets as inconvenient or unhygienic, which partly explains the low utilization of this facility (25.7%) despite its availability. Attitude responses are presented in Table 3.

Table 3. Attitude of Respondents Towards Sanitary Latrine Utilization (n=300)

Attitude Statement	Agree n (%)	Disagree / Neutral n (%)
Sanitary latrine improves family health	184 (61.3%)	116 (38.7%)
Would use a latrine if one were available at home	203 (67.7%)	97 (32.3%)
Open defecation is unhygienic and should be stopped	148 (49.3%)	152 (50.7%)
Government schemes should be availed for latrine construction	176 (58.7%)	124 (41.3%)
Community toilets are inconvenient / unhygienic	201 (67.0%)	99 (33.0%)

Table 4. Hygiene Practices Among Study Participants (n=300)

Hygiene Practice	Practiced n (%)	Not Practiced n (%)
Handwashing after defecation	207 (69.0%)	93 (31.0%)
Use of soap during handwashing	139 (46.3%)	161 (53.7%)
Handwashing before food preparation	179 (59.7%)	121 (40.3%)
Proper disposal of child feces in latrine	88 (29.3%)	212 (70.7%)
Use of footwear when going to toilet / open field	154 (51.3%)	146 (48.7%)

Handwashing after defecation was reported by 69% respondents; however, soap use during handwashing was practiced by only 46%, indicating that a substantial number who report handwashing do so with water alone. Handwashing before food preparation was practiced by around 60% respondents. Unsafe disposal of child faeces was noted in 70.7% households,

where child faeces were not disposed of in a latrine. Use of footwear while accessing toilets or open defecation sites was practiced by only 51% respondents, reflecting poor self-protective hygiene behaviours. Hygiene practices are summarized in Table 4.

Table 5. Reasons for Non-construction of Household Sanitary Latrines Among Non-latrine Owners (n=204)

Reason for non-construction	n (n=204)	%
Lack of money / financial constraint	84	41.2
Lack of interest / habitual preference for open defecation	39	19.1
Unawareness of government subsidy schemes	31	15.2
Lack of space within dwelling unit	27	13.2
Fear of structural problems / construction difficulty	14	6.9
Sociocultural / behavioural preference for open defecation	9	4.4

Note: Respondents not owning household sanitary latrines = open defecation (n=127) + community toilet users (n=77). Primary reason recorded per respondent.

Among the 204 respondents who did not possess a household sanitary latrine (i.e., those practicing open defecation or using community toilets), the most frequently cited reason was financial constraint (41%), followed by lack of interest or habitual preference for open defecation (19%), unawareness of government subsidy schemes (15%), lack of physical space within the dwelling (13%), fear of structural problems (7%) and sociocultural preference for open defecation (5%). Reasons for non-construction are presented in Table 5.

Table 6. Association Between Socio-demographic Variables and Practice of Open Defecation

Variable	Open Defecation n (%)	No Open Defecation n (%)	χ^2	p-value
Literacy: Illiterate (n=137)	88 (64.2%)	49 (35.8%)		
Literacy: Literate (n=163)	39 (23.9%)	124 (76.1%)	49.539	<0.001*
SES: Class IV–V (n=210)	101 (48.1%)	109 (51.9%)		
SES: Class I–III (n=90)	26 (28.9%)	64 (71.1%)	9.520	0.002*
Gender: Male (n=113)	51 (45.1%)	62 (54.9%)		
Gender: Female (n=187)	76 (40.6%)	111 (59.4%)	0.582	0.446
Age <30 years (n=89)	46 (51.7%)	43 (48.3%)		
Age ≥30 years (n=211)	81 (38.4%)	130 (61.6%)	4.534	0.033*
Family size ≥7 (n=75)	42 (56.0%)	33 (44.0%)		
Family size <7 (n=225)	85 (37.8%)	140 (62.2%)	7.651	0.006*
Kutcha house (n=85)	53 (62.4%)	32 (37.6%)		
Pucca/Semi-pucca house (n=215)	74 (34.4%)	141 (65.6%)	19.471	<0.001*

Note: Chi-square test applied for all associations. df=1 for all variables. *p<0.05 considered statistically significant. SES grouped as Classes I–III (higher) vs. IV–V (lower) for analytical purposes.

A statistically significant association was found between literacy status and the practice of open defecation. Among illiterate respondents, 64% practiced open defecation, compared to only 24% among literate respondents, reflecting the critical role of educational attainment in shaping sanitation behaviour. Socioeconomic status showed a significant association with open defecation practice. Among respondents in the lower socioeconomic classes (IV and V), 48% practiced open defecation, compared to 29% among those in Classes I–III, indicating a clear socioeconomic gradient in sanitation behaviour. Gender did not show a statistically significant association with open defecation. Open defecation was practiced by 45% males and 40% females, suggesting that educational and economic factors may exert a stronger influence than gender in this study population. A statistically significant association was found between age group and open defecation practice. Respondents below 30 years had a higher proportion of open defecation (51.7%) compared to those aged 30 years and above (38.4%). Family size was significantly associated with open defecation. Among households with seven or more members, 56% practiced open defecation, compared to 38% in smaller households, suggesting that larger households face greater demand on available sanitation infrastructure.

Type of house construction showed a significant association with open defecation. Among kutcha house dwellers, 62% practiced open defecation, compared to 34% among those in pucca or semi-pucca structures, indicating that type of house serves as a composite proxy for socioeconomic condition and structural feasibility of latrine construction. A summary of all associations is presented in Table 6.

DISCUSSION

The present study assessed the knowledge, attitude and practices regarding sanitary latrine utilization among households in an urban slum area of Ratanpar, Surendranagar. The findings reveal that open defecation remained a major public health problem in the study area despite ongoing national sanitation initiatives.

The prevalence of open defecation (42%) observed in the present study was considerably higher than the 33.1% reported by Anuradha et al.¹² in a rural Tamil Nadu population and also exceeds national urban slum estimates from NFHS-5.⁵ The higher prevalence observed in the present study may be attributed to socioeconomic disadvantages, overcrowding and infrastructural deficiencies commonly encountered in urban slums.^{5,7}

Only 32% of households reported using sanitary latrines at home, while 26% depended on community toilets. Similar observations have been reported by Barnard et al., who emphasized that accessibility, maintenance and user perceptions significantly affect utilization of sanitation facilities.⁹ Urban slum residents frequently face challenges related to land tenure, financial constraints and inadequate housing infrastructure, all of which may limit construction and use of private sanitation facilities.⁶⁻¹⁴

Awareness regarding disease transmission through open defecation was present among only 23% of respondents, which is consistent with the deficiencies reported by Joshi et al. among urban slum populations, who identified knowledge gaps as a major barrier to sanitation behaviour change.¹³ Notably, only 37% were aware of government sanitation schemes such as the Swachh Bharat Mission, despite its decade-long implementation. The Frontiers systematic review by VerKuilen et al. similarly documented that poor community awareness of government programmes and financial entitlements remained among the most consistent barriers to latrine construction and use across Indian settings.¹⁴

Although knowledge levels were poor, attitude towards latrine use was moderately positive: 61% agreed that latrines improve family health and 68% stated willingness to use a latrine if one were provided. This discordance between knowledge, attitude and practice is a well-recognised phenomenon in health behaviour literature and reinforces the need for combined infrastructure development alongside sustained behaviour change communication.^{8,9}

Handwashing after defecation was reported by 69% of respondents; however, soap use was noted in only 46%, and child faeces were safely disposed of by only 29% of households, indicating that reported handwashing practices substantially overstate truly safe hygiene behaviour due to social desirability bias. These findings underscore the importance of promoting comprehensive WASH practices beyond toilet access alone.

Financial constraints emerged as the most common reason for non-construction of household latrines (41%). Coffey et al. demonstrated that socioeconomic deprivation significantly influences toilet ownership and utilization among marginalized populations.¹⁰ Similarly, Patil et al. reported that targeted financial support and community-based sanitation interventions significantly improved sanitation uptake and reduced open defecation practices.¹⁵

The significant association between literacy and open defecation is consistent with findings reported by Coffey et al. and with national-level data from NFHS-5, which identify educational attainment as a primary protective determinant of sanitation behaviour.^{5,10} Popkova et al., in a spatial analysis using NFHS-5 data, confirmed that illiterate household heads were significantly more likely to practice open defecation at the district level.¹⁶

Socioeconomic status was also significantly associated with open defecation. Rajak demonstrated using NFHS-5 data that households in the poorest wealth quintiles face substantially greater barriers to improved sanitation, with those in the richest quintile having 47 times higher odds of utilizing improved sanitation compared to the poorest.¹⁷ The findings of the present study corroborate this socioeconomic gradient.

Gender was not significantly associated with open defecation in the present study. While educational and economic factors appear to exert a stronger influence in this population, the literature highlights that the burden of open defecation falls disproportionately on women and girls in terms of safety, privacy and dignity,² warranting continued gender-sensitive programme design even where statistical significance is not demonstrated.

Larger household size and kutchha house construction were also independently associated with open defecation. Both variables serve as proxies for poverty and limited physical infrastructure and are consistent with findings from spatial analyses of open defecation drivers in India.¹⁶

The findings of the present study support WHO recommendations that sanitation interventions should combine infrastructure development with behaviour change communication, community participation and continuous monitoring.¹

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Improved sanitation practices can substantially reduce the burden of communicable diseases and contribute to achieving Sustainable Development Goal 6.11,18 From a Community Medicine perspective, strengthening awareness regarding sanitation-related diseases, improving affordability and accessibility of household toilets and promoting community participation are essential components of sustainable sanitation programming.

CONCLUSION

The prevalence of open defecation among households in the urban slum area of Ratanpar was high. Awareness regarding health hazards associated with open defecation was poor, and attitude towards latrine adoption was only moderately positive despite poor knowledge. Financial constraints, habitual preference for open defecation and unawareness of government schemes were the major barriers to household latrine construction. Literacy status, socioeconomic status, age group, family size and type of house significantly influenced open defecation practices, while gender did not. Comprehensive sanitation interventions focusing on awareness generation, behaviour change communication and improved access to sanitation facilities are essential for reducing open defecation in urban slum communities.

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