



The Role of Cultural Communication in Enhancing Latrine Ownership in Rural Indonesia

Asriwati^{1✉}, Muh. Syaiful Akbar^{2✉}, Muhammad Syafar³, Zamli⁴, Yusuf⁵

¹Institute of Health Sciences Helvetia, Indonesia

²Universitas Negeri Makassar, Indonesia

³Hasanuddin University, Indonesia

⁴Mega Buana University, Indonesia

⁵Tamalatea University, Indonesia

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Abstract

Open defecation is a significant public health challenge in Indonesia, particularly in rural areas characterized by limited sanitation infrastructure and strong local cultural influences. Therefore, this study aimed to evaluate the effectiveness of a culturally tailored communication approach in increasing household latrine ownership and to identify the most influential behavioural factors. This quasi-experimental study examined 150 household heads divided into three groups, namely culturally-tailored participatory education, passive literacy-based dissemination, and control. Pre- and post-intervention assessments were conducted over three months and consisted of three structured sessions delivered at monthly intervals. The results showed that the culturally-tailored participatory education group experienced the most significant increase in latrine ownership (from 66% to 88%, $p=0.001$), compared to the passive literacy-based dissemination (from 76% to 78%) and the control group (80%). McNemar and Kruskal-Wallis tests confirmed the effectiveness of the cultural education intervention on behaviour change in the community. Furthermore, multivariate analysis within the cultural education group showed that community participation had the strongest correlation with increased latrine ownership ($r=0.377$; $p=0.007$), followed by partnerships ($r=0.306$; $p=0.031$) and regulation awareness ($r=0.307$; $p=0.030$). This study provides novel quantitative evidence that culturally tailored communication, beyond conventional education, can effectively transform sanitation behaviours in culturally complex rural settings.

INTRODUCTION

Sanitation and open defecation practices are among the most urgent public health challenges, particularly in developing countries. According to the WHO/UNICEF Joint Monitoring Programme report (2021), approximately 2.4 billion people worldwide still lack access to basic sanitation services, and nearly 1 billion people continue to practice open defecation. The health impact of inadequate sanitation is severe, leading

to diarrheal diseases associated with poor sanitation and causing an estimated 829,000 deaths annually among children under five (Gbadegesin et al., 2020; Jobin et al., 2025; Fagunwa et al., 2023; Murad et al., 2022). Aside from diarrhea, open defecation contributes to various other health problems such as cholera, dysentery, environmental enteropathy, stunting, and infant mortality (Belay et al., 2022; Mlewa, 2025; Buanasita et al., 2025; Amin et al., 2026). Consequently,

✉ Correspondence Address:

E-mail: asriwati@helvetia.ac.id / syaiful.akbar@unm.ac.id



improving access to and utilization of safe sanitation is a global development priority.

A similar situation exists in Indonesia where, despite ambitious national targets under Sustainable Development Goal (SDG) 6.2, which aim to achieve universal access to adequate sanitation by 2030, recent data show substantial gaps (Youth et al., 2022). In 2021, approximately 18.7% of Indonesian households lacked adequate latrine, and around 12.9% of the population still practiced open defecation (Lubis et al., 2022; Hindom et al., 2025). These challenges are most pronounced in rural areas, which represent the largest pockets of open defecation due to factors such as poverty, low education levels, limited access to clean water, and the strong influence of social and cultural norms (Budiman et al., 2022; Odagiri et al., 2017). Although the government has implemented the Community-Based Total Sanitation (STBM) program, the effectiveness remains limited because it does not address the complex local socio-cultural factors (Irawaty et al., 2022).

Previous sanitation intervention studies have primarily focused on infrastructure provision, economic determinants, or general health education approaches to reduce open defecation practices. Sanitation interventions such as Campaign and Community-Led Total Sanitation (CLTS), which focus on empowering communities to eliminate open defecation practices, showed promising results, but the outcomes have been inconsistent. The success of the program is not solely dependent on the availability of physical infrastructure such as latrine, but also critically hinges on sustained behaviour change. It can only be achieved through active community participation and communication approaches that respect local cultural values (Patil et al., 2015; Sahoo et al., 2015; Venkataramanan et al., 2018). Several studies emphasize that significant health benefits occur only when latrine use reaches a certain threshold within communities and is maintained over the long term (Chakrabarti et al., 2020).

Cultural communication approaches have become a promising strategy for delivering health education and fostering sustainable sanitation behaviour change. It refers to the transmission of messages through symbols, language, values, and narratives consistent with local cultural norms. This approach not only conveys information but also builds a sense of ownership and connection within communities regarding sanitation programs. Previous studies have shown that when communication strategies integrate local culture and involve community leaders, behavioural

change success significantly improves (González-Rodrigo et al., 2022; Sahiledengle et al., 2024). Based on the discussion above, this study aimed to comprehensively evaluate the influence of cultural communication-based interventions on increasing household latrine ownership in Rompu Village, a locale facing complex sanitation challenges rooted in local cultural values. A quasi-experimental design with pre- and post-test schemes was used, enabling quantitative analysis of significant changes across five key aspects. These include community knowledge about sanitation, awareness of sanitation regulations and norms, community participation in hygiene activities, strength of social partnerships between communities and supporting institutions, as well as changes in latrine ownership and usage behaviour.

This study developed an intervention design in the local and culturally sensitive context, assuming that communication strategies consistent with community values are more readily accepted and yield stronger behaviour change impacts. Therefore, the approach extends beyond information dissemination to foster dialogue, raise collective awareness, and strengthen social networks at the community level. To the best of knowledge, this is one of the few quasi-experimental studies in Indonesia to quantitatively compare culturally tailored communication with conventional health education and evaluate the effects on latrine ownership, making it a novel contribution to behavioural public health literature. Moreover, this study offers a novel contribution by integrating cultural communication principles into sanitation behaviour interventions through locally relevant narratives, symbols, traditional expressions, and involvement of community leaders. In contrast to conventional sanitation studies that mainly focus on infrastructure or general health education, the approach integrates cultural communication strategies with local beliefs, symbols, and traditional narratives. By engaging community leaders and tailoring messages to local identity, the intervention bridges technical knowledge with cultural meaning, offering a novel, context-specific approach to behaviour change.

METHOD

Study Design

This study used a quasi-experimental design with a pre-test and post-test approach to evaluate the effectiveness of a cultural communication strategy in increasing household latrine ownership. Three treatment groups were involved,

including (1) an intervention group that received culturally tailored participatory education, (2) an intervention group that received learning materials through a module, and (3) a control group that did not receive any intervention.

Population and Sample

The population consisted of all household heads in Rompu Village, Masamba Sub-district, North Luwu Regency, South Sulawesi Province, Indonesia. This village was selected because it represents a rural area with persistent open defecation practices, limited sanitation infrastructure, and strong socio-cultural influences on sanitation behaviour, making it an appropriate setting for evaluating culturally tailored communication interventions. In addition, the village had not previously received intensive sanitation education programs, thereby reducing the potential influence of previous interventions on study outcomes. A total of 150 household heads were purposively selected and proportionally divided into three groups (each comprising 50 respondents). The sample size was determined based on the total number of eligible households, the feasibility of implementing a community-based intervention, and the need to maintain balanced group sizes for comparison. Since this study was conducted under real-world community conditions with a limited target population, all eligible participants meeting the inclusion criteria were invited to participate. The final sample size was considered adequate to evaluate the effectiveness of the intervention while ensuring balanced comparisons across groups.

Inclusion criteria included permanent residents in the study area, willingness to participate, and availability throughout the intervention period. Purposive sampling was applied to ensure the inclusion of households that met these eligibility criteria. This approach was selected due to logistical constraints, limited population size, and the need to implement community-based interventions in naturally formed village clusters.

To minimize potential selection bias, respondents were proportionally allocated to the three study groups based on demographic characteristics, and baseline comparability was examined using chi-square tests. There were no statistically significant differences among groups in major sociodemographic variables ($p > 0.05$), showing reasonable baseline balance.

Intervention Procedure

The intervention was implemented over three months and consisted of three structured

sessions delivered at monthly intervals. The culturally tailored education group attended one structured session per month, each lasting approximately 90 minutes. Sessions were facilitated by trained community health workers and local leaders. Before the intervention, all facilitators participated in a standardized briefing conducted by the study team to ensure consistent delivery of the educational content, communication techniques, and procedures.

The educational content followed a standardized module developed by the study team and included sanitation-related health risks, benefits of latrine ownership, local regulations, community responsibilities, as well as available institutional support. Each session consisted of four components, namely (1) a brief presentation on sanitation-related health risks and benefits of household latrine ownership, (2) interactive group discussions on local sanitation challenges, (3) question-and-answer sessions addressing participants concerns, and (4) collaborative discussions on practical solutions for improving household sanitation.

Culturally relevant elements such as traditional storytelling, proverbs, and local symbols were incorporated to enhance engagement and contextual relevance. These cultural narratives were selected to reflect local beliefs, everyday experiences, and community values familiar to participants. Local leaders reinforced key sanitation messages by sharing community experiences and encouraging collective responsibility for eliminating open defecation. Educational sessions were delivered using locally familiar language and culturally appropriate communication styles to improve participants understanding and acceptance of the intervention.

The passive literacy-based dissemination group received printed educational materials containing identical content. This group was instructed to review the materials independently during the same three-month period. Moreover, the control group did not receive any structured intervention during the study period. To promote intervention fidelity, the same educational module, presentation materials, and discussion guide were used throughout the study. Attendance was recorded for each session, and facilitators followed a standardized session outline to ensure that all planned topics were delivered consistently across the intervention period.

Instruments and Data Collection

Data were collected using a structured questionnaire covering five variables, including

knowledge, regulation awareness, participation, partnership, and latrine ownership. The questionnaire used was developed based on previously published sanitation and health behaviour studies and adapted to the local socio-cultural context of the study area. Before implementation, the questionnaire was reviewed/content validation by public health practitioners and community facilitators to assess the clarity, relevance, and comprehensibility of the items for rural participants. Minor language adjustments were made to improve contextual understanding. However, formal psychometric testing, including statistical validity and reliability analyses, was not conducted. Data collection was conducted at baseline (T0) before the intervention and at three months post-intervention (T3). Knowledge was additionally measured after each monthly intervention session (T1, T2, and T3) to evaluate progressive cognitive changes. Based on the feedback, minor revisions to wording and local terminology were made to improve comprehension among rural participants. Although formal psychometric evaluation, including construct validity and internal consistency reliability testing, was not performed, the instrument was considered appropriate for the objectives of this community-based intervention because it was adapted from previously published questionnaires and subjected to expert review before implementation.

The knowledge section consisted of 15 structured items presented in multiple-choice and true/false formats. These items assessed participants understanding of open defecation practices, including causes and consequences, health risks associated with poor sanitation, characteristics of a healthy latrine, disease prevention through proper latrine use, and types of latrine. Each correct answer was scored as 1, while incorrect answers were scored 0.

Regulatory awareness was evaluated using five structured questions regarding knowledge of sanitation-related regulations, including district and village regulations, implementation status, and duration of enforcement. Each correct response was scored as 1, and incorrect or "do not know" was 0, resulting in a total score ranging from 0 to 5. Participants who correctly answered at least ≥ 3 out of 5 items ($\geq 60\%$ of the total score) were categorized as "aware," while those scoring < 3 were considered "not aware." The cut-off was determined a priori based on a majority-correct response criterion. Community participation was assessed through structured questions examining participants involvement in activities related to latrine construction, promotion, and utilization

within the community. Based on the responses, participants were categorized as showing either active or low/no participation. Partnership was similarly assessed through questions examining perceived collaboration between community members, local leaders, and government authorities in supporting latrine construction and use. Participants were subsequently categorized as having strong or weak partnership perception. Household latrine ownership was measured using binary questions regarding ownership status (yes/no), defecation practices, type of latrine used, and structural characteristics of the facility. Ownership was coded as 1 (owns a household latrine) and 0 (does not own a household latrine).

Aside from the self-reported questionnaire, direct household observations were conducted by trained enumerators to verify the presence and condition of latrine facilities. A structured observation checklist was used to assess latrine availability, functionality, cleanliness, and accessibility. When discrepancies arose between self-reported responses and observational results the direct observation records were prioritized based on direct observation records.

Ethical Considerations

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Health Research Ethics Committee, Faculty of Public Health, Hasanuddin University, Indonesia (Approval No. 542/H4.8.4.5.31/PP36-KOMETIK/2017; approved on 28 July 2017). The committee was chaired by Prof. Dr. dr. Suryani As'ad, M.Sc., Sp.GK(K).

Before data collection, all eligible participants received verbal and written information regarding the study objectives, procedures, potential benefits, and individual rights. Written informed consent was obtained from all participants before enrolment. Participation was entirely voluntary, and participants were informed of the right to withdraw at any time without any consequences. To protect privacy, all collected data were anonymized and treated confidentially throughout the study.

RESULT AND DISCUSSION

The characteristics of participants were a predominance of males aged 40–49 years (Table 1), most of whom had completed elementary school education and the majority working as farmers, with family sizes generally ranging from 1 to 4 members. Chi-square test results showed no significant differences among the groups for

Table 1. Baseline distribution of respondent characteristics

Characteristic		Culturally-tailored participatory education (n=50)	Passive literacy-based dissemination (n=50)	Control Group (n=50)	p-value
Age	20 – 39 years	6 (12)	3 (6)	4 (8)	0.168
	30 – 39 years	12 (24)	11 (22)	5 (10)	
	40 – 49 years	17 (34)	17 (34)	16 (32)	
	50 – 59 years	10 (20)	5 (10)	12 (24)	
	≥ 60 years	5 (10)	14 (28)	13 (26)	
Gender	Male	34 (68)	35 (70)	41 (82)	0.231
	Female	16 (32)	15 (30)	9 (18)	
Education	Did not complete elementary school	1 (2)	1 (2)	2 (4)	0.462
	Elementary school (SD)	29 (58)	33 (66)	34 (68)	
	Junior high school (SLTP)	6 (12)	6 (12)	7 (14)	
	Senior high school (SLTA)	14 (28)	8 (16)	5 (10)	
	Higher education (PT)	0	2 (4)	2 (4)	
Occupation	Housewife (IRT)	11 (22)	15 (30)	6 (12)	0.276
	Entrepreneur	1 (2)	0	0	
	Labourer	2 (4)	1 (2)	3 (6)	
	Farmer	36 (72)	34 (68)	41 (82)	
Family size	1–4 members	30 (60)	25 (50)	25 (50)	0.512
	> 4 members	20 (40)	25 (50)	25 (50)	

these variables ($p > 0.05$), indicating comparable baseline characteristics and ensuring the validity of comparisons between treatment groups. The low education level and farming occupation reflect typical conditions in Indonesian rural communities, which often face limitations in health literacy and access to information.

Figure 1 shows the changes in average knowledge scores of participants across the three treatment groups measured at four time points, namely baseline, first, 2nd, and 3rd month after intervention. At baseline, the control group had the highest knowledge score (mean=5.14), followed by passive literacy-based dissemination (mean=4.78), while culturally-tailored participatory education had the lowest score (mean=3.74). However, after the interventions were implemented, substantial increases in knowledge scores were observed, specifically in the culturally-tailored participatory education and passive literacy-based dissemination groups.

The culturally-tailored participatory education group showed the largest increase in

knowledge scores, rising from 3.74 to 18.84 at the 3rd month. Meanwhile, the passive literacy-based dissemination group also showed a consistent improvement from 4.78 to 16.80. The control group showed only a slight increase from 5.14 to 11.68, possibly due to external factors or natural changes. These results showed that cultural communication-based interventions, particularly direct and interactive lecture approaches, are more effective in enhancing community knowledge related to sanitation.

Figure 1a shows that the mean knowledge scores in all three groups increased significantly after receiving the interventions, as indicated by paired t-test results with significance values of $*p < 0.001$. At the initial measurement (T0), the control group had the highest score (5.04 ± 2.60), followed by Group 2 (4.48 ± 3.18), while culturally-tailored participatory education had the lowest score (3.78 ± 2.34). In addition to knowledge improvement, other variables also increased, such as regulation awareness, community participation, and partnership knowledge, after the in-

tervention. Following the staged interventions, all groups experienced improvements, with significant differences. Therefore, the correlation with the increasement of latrine ownership is shown in Table 2.

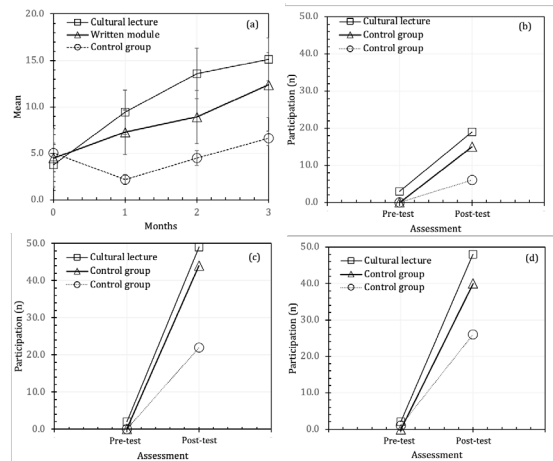


Figure 1. Changes in respondents' (a) knowledge scores every month, (b) regulation awareness, (c) community participation, (d) partnership pre- and post-test

Baseline measurements showed that latrine ownership was highest in the control (80%), followed by passive literacy-based dissemination (76%) and the culturally-tailored participatory education group (66%). After the intervention,

latrine ownership increased to 88% in the culturally-tailored participatory education group, with a total 33.33% increase. An opposite trend was found in the passive literacy-based dissemination group, which experienced only a 2.63% increase in latrine ownership. These results were supported by the McNemar test, which yielded a significance value of P-value = 0.001, showing the intervention had a meaningful impact on changing latrine ownership behaviour. Meanwhile, passive literacy-based dissemination showed only one additional latrine (P-value = 1.000), and no changes were observed in the control group.

Further analysis showed that the increase in latrine ownership was associated with changes in the distribution of community participation, regulatory awareness, and partnership (Table 3). In rural Indonesia settings, such as Rompu village, the effective dissemination of sanitation regulations depends not only on formal education but also cultural communication approaches aligned with local values. Previous studies have shown that targeted awareness campaigns, such as CLTS, significantly improve understanding and latrine ownership (Harter et al., 2018; Nanyim et al., 2022). However, the effectiveness of these educational efforts is strongly influenced by social norms and collective attitudes towards sanitation practices, as social acceptance of open defecation remains a barrier despite increased knowledge (Bushen et al., 2022; Hailu et al., 2022).

Table 2. Distribution of respondents based on latrine ownership pre- and post-test

Group		Pre-treatment	Post-treatment	Percentage	P-value
Culturally-tailored participatory education		33 (66%)	44 (88%)	33.33%	0.001
Passive literacy-based dissemination		38 (76%)	39 (78%)	2.63%	1.000
Control group		40 (80%)	40 (80%)	0%	1.000
Distribution of latrine					
Culturally-tailored participatory education	Latrine	33 (66%)	44 (88%)	11 (22%)	0.001
	Garden	1 (2%)	0 (0%)	1 (-2%)	1.000
	River	15 (30%)	6 (12%)	9 (-18%)	0.001
	Yard	1 (2%)	0 (0%)	1 (-2%)	1.000
Passive literacy-based dissemination	Latrine	38 (76%)	39 (78%)	1 (2%)	1.000
	Garden	3 (6%)	3 (6%)	-	1.000
	River	5 (10%)	4 (8%)	1 (-2%)	1.000
	Yard	4 (8%)	4 (8%)	-	1.000
Control group	Latrine	40 (80%)	40 (80%)	-	1.000
	Garden	1 (2%)	1 (2%)	-	1.000
	River	7 (14%)	7 (14%)	-	1.000
	Yard	2 (4%)	2 (4%)	-	1.000

Regulatory frameworks play an important role. Clear and locally enforced regulations may function as behavioural references internalized by communities (Nanyim et al., 2022; Yulyani et al., 2019). In addition, the distribution of knowledge is influenced by gender norms and social structures, where women experiences often shape motivation but also limit the role in information dissemination (Novotný et al., 2022). Support from community leaders and modelling of good sanitation behaviours have been proven to accelerate the adoption of hygienic practices at the household level (Dreibelbis et al., 2015). Therefore, integrating culture-based communication approaches into educational strategies and regulatory enforcement is crucial to bridging community beliefs and behaviours. The results suggest that direct cultural communication can effectively increase latrine ownership by strengthening awareness, participation, and local partnerships.

This intervention was guided by the Health Belief Model (HBM) and cultural framing theory, stating that health behaviours are more likely to change when risk perceptions and benefits are communicated through culturally relevant narratives and trusted community figures.

Community participation and partnerships were significantly associated with increases in new household latrine ownership. In particular, community participation correlated with latrine ownership in the passive literacy-based dissemination group, showing that local government regulations and partnerships between village government and private sectors successfully contributed to latrine ownership increases. In contrast, no significant changes in latrine ownership numbers

were observed in the control group.

The interaction among knowledge, regulations, community participation, and partnerships plays an important and interconnected role in promoting latrine ownership and usage in rural areas. Knowledge of sanitation regulations provides an essential foundation for encouraging positive behaviours (Xu., 2025). Furthermore, access to information on policies and government incentives directly increases latrine ownership (Jain et al., 2018). These results are consistent with those of Laika and Adriyani (2021), who reported significant correlations between community knowledge and attitudes, obtained through educational campaigns, and sanitation behaviour. However, knowledge alone is insufficient without clear regulations (Laika et al., 2021). The implementation of local sanitation regulations and technical guidelines for latrine construction fosters compliance with hygiene standards and strengthens latrine ownership behaviours (Busienei et al., 2019). In this context, the cultural communication approach used plays a crucial role as a bridge connecting technical information with local community values, thereby facilitating the internalization of sanitation norms and policies more effectively (Yulyani et al., 2019).

Active community participation and cross-sector partnerships are also key success factors in community-based sanitation promotion (Clarke et al., 2021). Engagement of residents, local leaders, government bodies, and non-governmental organizations fosters increased latrine ownership and usage by creating shared responsibility (Odagiri et al., 2017; Bushen et al., 2022). In addition, social networks wield considerable influence,

Table 3. Correlation Between Knowledge, Regulation, Participation, Partnership, and Increase in Latrine Ownership

Group	Variable	r	p-value
Culturally-tailored participatory education	Knowledge	0.157	0.278
	Regulation Awareness	0.307	0.030*
	Community Participation	0.377	0.007*
	Partnership	0.306	0.031*
Passive literacy-based dissemination	Knowledge	0.091	0.529
	Regulation Awareness	0.094	0.518
	Community Participation	0.387	0.006*
	Partnership	0.071	0.2
Control group	Knowledge	—	—
	Regulation Awareness	—	—
	Community Participation	—	—
	Partnership	—	—

*P-value < 0.05

as social norms and collective pressures significantly affect individual decisions to build latrine. In this study, cultural communication functions as a mechanism for strengthening relationships among actors within the community and conveying sanitation messages using symbols, language, and narratives closely connected to everyday life. Therefore, the success of increasing latrine ownership through this approach arises not only from information dissemination but also the ability to bridge beliefs and behaviours through norms, social structures, and strong community partnerships (Shakya et al., 2014).

Impact of Cultural Communication on Latrine Ownership in Health Improvement Indices

Cultural communication plays a critical role in influencing latrine choices and ownership, particularly in rural communities (Vicario et al., 2023) where open defecation practices persist. Previous studies have shown that cultural norms and behaviours constitute the main foundation shaping sanitation habits (Kohlitz et al., 2021). Sanitation-related behaviour is significantly influenced by cultural constructs, making interventions that overlook local cultural lenses prone to failure in achieving desired behaviour changes (Thys et al., 2015). This assertion is supported by Busienei et al. (2019), who found that despite available sanitation infrastructure in Lodwar, Kenya, cultural habits and rituals remain the primary barriers to latrine adoption (Busienei et al., 2019). A deep understanding of local cultural dynamics must be integrated into sanitation messaging to enhance contextual relevance and acceptance.

Knowledge of latrine ownership regulations plays an important role in promoting household latrine adoption. Understanding sanitation standards and the health benefits associated with these regulations contributes to community acceptance of latrine construction (Kanda et al., 2019). However, information delivery without considering cultural sensitivity may cause confusion and non-compliance (Hailu et al., 2022). Therefore, cultural communication is not only about transmitting information but building understanding that aligns with community values and perceptions.

Community participation and cross-sector partnerships are crucial for sustainably increasing latrine ownership. In the CLTS approach, active community involvement has been shown to raise latrine ownership levels (Hailu et al., 2022). Culture-based communication strategies build trust and solidarity, encouraging collective action

to create cleaner environments. This participatory approach is also essential in latrine design and placement. When communities are involved in decision-making processes, the possibility of reverting to open defecation decreases (Dreibelbis et al., 2015). Partnerships among government agencies, NGOs, traditional leaders, and communities form crucial bridges for conveying sanitation messages consistent with local values and practices. Cross-actor collaboration facilitates joint learning and adaptation of interventions to community-specific needs, while also opening spaces for the discussion of more accommodating policies and regulations sensitive to cultural contexts.

Although this study showed promising results, it primarily reflects short-term behavioural changes following the intervention period. Despite significant improvements in latrine ownership, regulation awareness, community participation, and partnership observed within three months, the sustainability of these behavioural changes over longer periods remains uncertain. Behavioural transformation related to sanitation practices is often influenced by continuous social reinforcement, economic conditions, infrastructure maintenance, and long-term community engagement. Therefore, the observed improvements should be interpreted as early-stage behavioural adaptation rather than permanent behavioural change. Longitudinal studies with extended follow-up periods are needed to evaluate whether culturally tailored communication interventions can sustain sanitation behaviours over time.

Innovative Mechanisms through Cultural Communication

The results showed that health messages delivered through culturally familiar formats, proverbs, and symbolism were more readily internalized by participants. In contrast to conventional education methods, this approach activated emotional and identity-based engagement, fostering behavioural change that extended beyond information recall. Despite the advantages, several limitations should be acknowledged. First, the quasi-experimental design without random assignment introduces potential selection bias, which may limit internal validity and restrict causal inference. Although baseline comparability was assessed, differences in initial latrine ownership between groups suggest possible baseline imbalance, which may have influenced the magnitude of observed changes and introduced potential ceiling effects.

Second, the use of purposive sampling

limits the generalizability of results beyond the study setting. Third, contamination or spillover effects between groups cannot be ruled out, as participants resided within the same community and may have shared information regarding sanitation practices. Fourth, although the structured questionnaire had been subjected to initial validation, measurement limitations remain possible. Self-reported responses may be subject to social desirability bias, despite verification through direct observation of latrine facilities.

Fifth, alternative explanations for behavioural change, such as concurrent government sanitation programs, community-level pressure, or other external influences, cannot be fully excluded. Finally, although outcomes were monitored for three months after the intervention, this follow-up period may still be insufficient to determine the long-term sustainability of behavioural change and infrastructure adoption. Finally, no formal a priori sample size calculation or statistical power analysis was performed. This implies that the results should be interpreted with consideration of the community-based sampling framework.

CONCLUSION

In conclusion, this study shows that a cultural communication approach can significantly improve latrine ownership in rural areas within a short period. The culturally based lecture intervention not only significantly increased latrine ownership (from 66% to 88%) but also promoted improvements in knowledge, awareness of sanitation regulations, community participation, and local partnerships, foundations for sustainable behaviour change.

The results suggest sanitation behaviour change cannot rely solely on providing physical infrastructure but requires communication strategies that bridge local beliefs and new health practices. In this context, cultural communication using language, symbols, and narratives consistent with the local context effectively fosters a sense of ownership of programs, builds trust, and strengthens social interactions within the community.

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DECLARATION OF GENERATIVE AI

This manuscript received limited assistance from an AI-based language tool (Quillbot and ChatGPT) for language refinement and grammar checking. The authors critically reviewed and finalized all content and accept full responsibility for the published work. No AI tools were used in data analysis or the interpretation of findings.

DECLARATION OF COMPETING INTEREST

The authors declare no conflicts of interest related to the research activities or the publication of the study findings.

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