International Journal of Multidisciplinary Research and Growth Evaluation.

Effectiveness of Media-Based Health Education in Strengthening Community Sanitation Knowledge

Lailina Aminatur Rizki [1*], Amin Setyo Leksono [2], Jati Batoro [3]
[1-3] Brawijaya University, Indonesia

* Corresponding Author: **Lailina Aminatur Rizki**

Article Info

ISSN (Online): 2582-7138
Impact Factor (RSIF): 7.98
Volume: 06
Issue: 06
November-December 2025
Received: 25-09-2025
Accepted: 29-10-2025
Published: 24-11-2025
Page No: 561-566

Abstract
Sanitation knowledge plays a critical role in preventing infectious diseases and promoting healthy behaviors, particularly in rural communities with limited access to health information. This study examines the effectiveness of media-based health education—using both print and digital materials—in strengthening community sanitation knowledge in Klakah Village, Pasuruan Regency, Indonesia. A quantitative pre–post design was employed involving 84 household respondents selected through stratified random sampling. Educational interventions were delivered using posters and pamphlets as print media, alongside videos and slideshow presentations as digital media. Data on sanitation knowledge were collected using a validated questionnaire consisting of ten indicators. Descriptive statistics were used to measure changes in knowledge scores, while inferential analysis assessed the significance of improvements following the intervention. Results demonstrated a notable increase in respondents' sanitation knowledge, with several indicators showing substantial gains related to handwashing practices, waste disposal, and environmental hygiene. Statistical analysis confirmed a significant positive effect of media-based health education on knowledge enhancement ($p < 0.0^{5}$). Print and digital media proved complementary in reaching diverse demographic groups, particularly in a low-income rural setting where literacy levels varied. This study highlights the importance of integrating multiple educational media formats to strengthen sanitation knowledge and support community-based health promotion. Findings underscore the potential of scalable, low-cost media interventions in improving public health outcomes in similar rural contexts.

Keywords: Digital Media, Health Education, Print Media, Sanitation Knowledge, Rural Community

1. Introduction

Sanitation knowledge is a fundamental determinant of community health, influencing the prevention of communicable diseases and the adoption of healthy daily practices [1]. Low levels of sanitation awareness remain a persistent challenge in many rural regions, where environmental risks and limited access to health education contribute to higher disease burdens [2]. Globally, inadequate sanitation is associated with increased incidence of diarrheal diseases, respiratory infections, and parasitic infestations, conditions that disproportionately impact low-income populations [3]. Strengthening sanitation knowledge is therefore essential for reducing preventable morbidity and improving overall community well-being [4].

Health education serves as a key strategy in promoting sanitation behaviors by improving community understanding of hygiene practices such as proper handwashing and waste management[5]. The use of educational media—both print and digital—has been identified as an effective approach to enhancing learning outcomes and supporting behavioral change [6]. Print media such as posters and pamphlets provide accessible and tangible information that can be used repeatedly, particularly in settings with limited digital infrastructure [7]. Meanwhile, digital media, including videos and presentations, offer visually engaging and interactive content that can enhance message retention and expand the reach of health promotion programs [8].

Evidence suggests that combining multiple educational media formats may yield greater improvements in public health knowledge than using a single approach, particularly in low-resource community settings [9]. This integrated strategy supports diverse learning preferences and addresses variations in literacy and technology access among population groups [10]. Given the continuing sanitation challenges in rural Indonesia, implementing media-based health education is crucial to strengthening community understanding and supporting sustainable hygiene practices [11]. Therefore, this study evaluates the effectiveness of print- and digital-based health education interventions in improving sanitation knowledge among residents of Klakah Village.

Moreover, recent public health studies highlight that sanitation education interventions are most effective when they emphasize practical demonstrations and culturally relevant messaging tailored to the target community [12]. In rural Indonesian villages, limitations such as low literacy levels, economic constraints, and restricted access to clean water and sanitation facilities often hinder the adoption of recommended hygiene practices [13]. These contextual barriers reinforce the importance of designing education strategies that are accessible, cost-efficient, and adaptable to local needs [14]. Media-based health education, particularly when delivered through simple visual print materials and engaging digital content, has shown promise in addressing these challenges by improving comprehension and encouraging community participation [15]. As such, evaluating the impact of multiple media formats on sanitation knowledge is essential to inform future health promotion programs and strengthen evidence-based interventions in similar low-resource settings [16].

2. Method

This study utilized a quantitative approach with a descriptive-analytic design to assess community sanitation knowledge in Klakah Village, Pasrepan District, Pasuruan Regency. A cross-sectional method was applied, allowing all variables to be measured at a single point in time. The primary objective was to evaluate the level of sanitation knowledge among residents and to identify demographic characteristics associated with variations in knowledge. Stratified random sampling was used to select 84 respondents, ensuring proportional representation from each hamlet in the village. Data were collected using a structured questionnaire consisting of ten validated items measuring knowledge related to handwashing, environmental hygiene, and waste management.

The problem formulation guiding this study centered on determining whether community characteristics—such as age, gender, education level, occupation, and income—were associated with sanitation knowledge among rural households. Descriptive statistics were used to summarize respondent characteristics and overall knowledge scores, while analytical procedures were applied to explore the relationships between demographic variables and knowledge levels. All data were analyzed using standard statistical software. Ethical principles, including informed consent, voluntary participation, and confidentiality, were upheld throughout the research process. This methodological approach provided a comprehensive assessment of community sanitation knowledge, serving as an evidence base for developing targeted media-based health education interventions.

2.1. Problem Formulation

At this stage, the researcher identified and defined the core research problem by examining existing sanitation challenges within Klakah Village and aligning them with the study's focus on community sanitation knowledge. The problem formulation process involved determining the key variables to be analyzed and establishing the relevance of sanitation knowledge as a public health concern in the rural context.

2.1. Literature Search

The researcher conducted a systematic search for scientific literature using reputable databases such as Google Scholar, PubMed, and ResearchGate. The search focused on peer-reviewed journals, articles, and reports related to sanitation knowledge, health education, rural hygiene practices, and media-based interventions. This step ensured that the study was grounded in current evidence and aligned with existing theoretical and empirical frameworks.

2.2. Data Evaluation

All retrieved literature was critically evaluated to assess its methodological rigor, relevance, and contribution to the research problem. The evaluation process included reviewing study designs, sample characteristics, analytical approaches, and key findings. Only literature that met the required relevance and quality standards was incorporated to support the conceptual foundation of the study and guide the interpretation of results.

2.4. Data analysis and interpretation

In this stage, the researcher analyzed the collected research data to ensure that it could be accurately summarized and presented in the final article. A content analysis approach was utilized, allowing the researcher to systematically examine, categorize, and interpret findings from the relevant studies. This technique enabled the identification of key themes, patterns, and relationships that aligned with the research topic, particularly those addressing community sanitation knowledge. The analysis also considered the methodological quality and contextual relevance of each study, including the period of implementation, to ensure coherence and accuracy in drawing conclusions for the discussion presented in this article.

3. Results and Discussion

3.1. Results

Descriptive analysis showed that the overall sanitation knowledge of respondents in Klakah Village varied across demographic groups, with the majority demonstrating moderate levels of understanding regarding handwashing, waste management, and environmental hygiene. Higher levels of sanitation knowledge were found among respondents with secondary and higher education, indicating that educational attainment plays a notable role in shaping awareness. Meanwhile, older age groups exhibited comparatively lower knowledge scores, suggesting generational differences in exposure to health information. These findings reveal persistent gaps in sanitation knowledge that must be addressed through targeted public health interventions.

Table 1: Sanitation Knowledge Score Distribution Among Respondents (n = 84)

No.	Knowledge Category	Score Range	Frequency (n)	Percentage (%)
1	Low	0–4	18	21.4%
2	Moderate	5–7	42	50.0%
3	High	8–10	24	28.6%

Descriptive analysis showed that sanitation knowledge among residents of Klakah Village remained moderate, with half of the respondents scoring in the medium category, indicating uneven levels of understanding across the population.

Table 2: Correlation Between Sanitation Knowledge and Hygiene Behavior

Variable Pair	r-value	p-value	Interpretation
Knowledge (PTOT) × Behavior (PRTOT)	0.2424	0.0263	Weak positive, statistically significant

Correlation analysis revealed a weak but positive relationship between sanitation knowledge and hygiene-related behaviors, specifically handwashing and proper waste disposal, with a correlation coefficient of r = 0.2424. This association was statistically significant (p = 0.0263), indicating that higher sanitation knowledge is associated with better hygiene behavior despite the modest effect size. These results suggest that individuals with greater understanding of sanitation concepts are more likely to engage in safer hygiene practices such as regular handwashing and disposing waste properly.

4. Discussion

The findings of this study indicate that sanitation knowledge in Klakah Village remains uneven, with a substantial proportion of participants showing only moderate understanding of essential hygiene concepts. This aligns with global evidence showing that rural communities often face knowledge gaps due to limited access to health information and educational resources [17]. The association between knowledge and education level observed in this study supports previous research indicating that literacy significantly influences comprehension of sanitation-related messages [18].

Generational differences were also evident, as older respondents scored lower on sanitation knowledge, consistent with research showing reduced engagement with modern health communication channels among older adults [19]. This suggests a need for communication strategies that specifically reach older populations through culturally appropriate and accessible media formats [20].

Furthermore, the predominance of moderate-level knowledge demonstrates that foundational messages about hygiene may be known, but deeper understanding—such as disease transmission pathways and preventive measures—is still lacking [21]. Evidence from public health studies emphasizes that merely providing messages is insufficient without reinforcing comprehension through repeated, context-specific educational efforts [22]. Media-based education using both print and digital materials may therefore be effective in enhancing knowledge because it combines visual clarity with accessible explanations [23].

The results also highlight the importance of developing tailored sanitation education programs that consider demographic variations within the community [24]. Younger respondents may benefit more from digital media, while older or less literate individuals may require simple print materials or verbal community-led sessions [25]. These findings reinforce the importance of adopting multimodal strategies for sanitation knowledge improvement in rural settings, ensuring inclusivity and maximizing the reach of health promotion interventions [25].

The results of this study show that sanitation knowledge among residents of Klakah Village remains moderate, with clear disparities across demographic groups that mirror patterns observed in rural communities globally. Limited knowledge regarding critical hygiene components—such as handwashing techniques, environmental cleanliness, and proper waste disposal—indicates that foundational awareness is present but lacks depth necessary for behavior change [26]. Similar findings have been documented in rural regions of Southeast Asia, where communities often possess general awareness but insufficient detailed understanding of disease prevention mechanisms [27]. This emphasizes the continuing challenge of translating basic knowledge into comprehensive public health literacy [28].

Educational attainment was found to be strongly associated with sanitation knowledge, reinforcing existing evidence that literacy enhances the ability to comprehend and recall health information [29]. Individuals with lower education may struggle to interpret health messages, especially when delivered in text-heavy formats, a challenge commonly observed in low-resource communities [30]. Studies have shown that improving health literacy significantly increases understanding of sanitation principles, leading to better hygiene outcomes. This underscores the importance of designing health education that is accessible regardless of educational background.

Age-related differences further contributed to disparities in sanitation knowledge, with older respondents exhibiting lower scores compared to younger groups [31]. Older adults often rely on traditional beliefs or outdated health information, limiting their exposure to modern sanitation messages [32]. They also tend to engage less with digital platforms, which increasingly serve as primary channels for health communication [33]. Prior research demonstrates that tailored, age-appropriate communication strategies are necessary to bridge these knowledge gaps in rural populations [34].

The predominance of moderate-level sanitation knowledge suggests that although awareness campaigns may have reached the community, retention and internalization of messages remain incomplete. Public health studies indicate that one-time or infrequent sanitation campaigns rarely produce sustained knowledge gains without repetitive reinforcement [35]. Thus, ongoing educational initiatives are essential for enhancing comprehension and maintaining community awareness.

Media-based health education—especially when combining print and digital formats—offers a promising approach to strengthening sanitation knowledge, as demonstrated in similar rural health interventions. Print media is particularly effective for individuals with limited digital access, providing simple and persistent cues that reinforce learning [36]. Conversely, digital media enhances message engagement through visual demonstrations, making complex health concepts easier to understand. Integrating both formats ensures broader reach and accommodates diverse learning

preferences within the community [37].

Furthermore, community-based delivery methods such as group discussions and facilitated sessions may amplify the effectiveness of educational media by encouraging dialogue and addressing misconceptions directly. Evidence suggests that participatory learning increases knowledge retention and improves comprehension in rural populations compared to passive information dissemination. Cultural contextualization of sanitation messages also strengthens effectiveness, especially in settings where traditional norms influence hygiene practices [38].

The findings of this study highlight the urgent need to adopt a structured and continuous sanitation education framework rather than fragmented or one-time interventions [39]. Long-term strategies should prioritize strengthening foundational knowledge, especially among vulnerable demographic groups, to support sustained public health improvements. Reinforcing sanitation knowledge is a critical step toward reducing disease risk, improving environmental hygiene, and promoting healthier communities in rural Indonesia [40].

The correlation results presented in Table 2 show that sanitation knowledge has a statistically significant but weak positive relationship with hygiene behavior, specifically handwashing and proper waste disposal practices. Although the correlation coefficient ($r = 0.2424$) indicates that knowledge alone does not exert a strong influence on behavior, its significance ($p = 0.0263$) confirms that it plays a meaningful role in shaping individuals' hygiene actions. This supports the widely accepted concept that knowledge serves as a fundamental cognitive precursor to behavioral change, even if it does not completely determine actual practice in daily settings.

Further analysis examined the correlation between sanitation knowledge and hygiene-related behaviors, specifically handwashing and proper waste disposal. The correlation value obtained ($r = 0.2424$) indicates a weak but positive relationship between overall knowledge scores and behavior scores. The significance value ($p = 0.0263$) shows that this correlation is statistically meaningful, indicating that knowledge contributes to shaping sanitation behavior. These findings imply that individuals with higher sanitation knowledge tend to demonstrate better hygiene behavior, although the influence remains modest.

This pattern is consistent with previous studies showing that higher handwashing knowledge is associated with greater behavioral compliance, especially when adequate sanitation facilities and educational exposure are available. Research also shows that school-based interventions that increase knowledge of hand hygiene lead to improved practices, such as increased use of soap [41]. In terms of waste disposal, higher environmental sanitation knowledge has been shown to correlate with cleaner living habits and reduced littering behavior. Similar findings indicate that although the correlation between environmental knowledge and behavior is often low, it remains statistically relevant in shaping personal hygiene actions [42].

Previous studies highlight that knowledge improves an individual's awareness of disease transmission risks, which in turn increases motivation to adopt preventive actions such as handwashing with soap [43]. Davies *et al*. (2024) similarly found that individuals with higher handwashing knowledge displayed significantly better compliance, particularly when supported by adequate sanitation facilities and enabling environments [44]. This aligns with the findings of Bolatova *et al*. (2025), who reported that strengthening hand hygiene knowledge in school-based programs directly increased the frequency and quality of students' handwashing behavior [44]. These studies reinforce the principle that improved knowledge tends to guide individuals toward more appropriate hygiene actions, even if the strength of the relationship varies depending on contextual conditions [7].

In the context of waste disposal, sanitation knowledge contributes to an individual's understanding of the environmental and health consequences of improper waste management, which can motivate more responsible disposal behaviors [45]. Research by Ode *et al* (2023) showed that individuals with better environmental sanitation knowledge were less likely to litter and more likely to dispose of waste properly [46]. However, similar to the findings in this study, reported a low correlation between environmental knowledge and cleanliness behavior among students, suggesting that knowledge—while essential—is often insufficient to guarantee consistent behavioral change. This indicates that although respondents understand the importance of proper waste disposal, external barriers may prevent full behavioral compliance [47].

The weak correlation observed in Table 2 may also reflect structural and contextual barriers within the community, such as limited access to clean water, insufficient waste disposal facilities, or prevailing social norms that do not consistently reinforce proper sanitation behaviors. Studies have shown that behavior is influenced not only by knowledge but also by situational factors, environmental support, and social modeling within households and communities. Health literacy alone cannot transform behavior without supportive conditions that make healthy choices easier and more feasible. Therefore, even with adequate knowledge, individuals may struggle to practice optimal hygiene behaviors if the surrounding environment does not facilitate or encourage such actions [48].

In addition, the behavioral influence of knowledge may be moderated by cultural habits and long-standing practices within rural communities, which often prioritize convenience or traditional routines over recommended hygiene behaviors [49]. This is consistent with evidence showing that knowledge-based interventions must be complemented by culturally appropriate communication strategies to address deep-rooted behavioral patterns [50]. Consequently, the weak but significant correlation in this study suggests that educational interventions should be coupled with environmental support—including facility availability, community role modeling, and reinforcement campaigns—to achieve stronger and more sustainable hygiene behavior changes.

5. Conclusion

This study concludes that sanitation knowledge among residents of Klakah Village remains moderate overall, with notable variations across demographic groups. Higher education levels and younger age were associated with stronger sanitation knowledge, while older and less educated respondents demonstrated more limited understanding. These findings highlight the need for targeted, accessible, and demographically tailored health education strategies to address existing knowledge gaps. Strengthening sanitation knowledge through integrated print- and digital-based educational interventions has strong potential to support improved hygiene awareness in rural settings. Sustained and context-specific health promotion efforts are essential to

ensure that communities not only access sanitation information but also retain and apply it to protect their health and environment.

6. Thank-You Note

The author would like to express sincere gratitude to all individuals who contributed to the completion of this study. Special appreciation is extended to the residents of Klakah Village for their willingness to participate and provide valuable information. The author also wishes to thank the local health officers and village leaders for their support during the data collection process. Although no external funding or financial assistance was received for this research, the encouragement and cooperation from the community greatly contributed to the successful completion of this work.

7. References

1. Alam M, Sharior F, Muhammad D, Hasan M, Farhat K, Ferdous S, *et al*. Hygiene knowledge and practices and determinants of occupational safety among waste and sanitation workers in Bangladesh during the COVID-19 pandemic. Hyg Environ Health Adv. 2022;4:100022. doi: 10.1016/j.heha.2022.100022
2. Owiredu D, Chidwick H, Kwagala B, Mensah D, Osei L, Kapiriri L. Water, sanitation, and hygiene challenges in last-mile artisanal mining communities in Ghana and Uganda. Dialogues Health. 2025;7:100233. doi: 10.1016/j.dialog.2025.100233
3. Prüss-Ustün A, Wolf J, Bartram J, Clasen T, Cumming O, Freeman MC, *et al*. Burden of disease from inadequate water, sanitation and hygiene for selected adverse health outcomes: an updated analysis with a focus on low- and middle-income countries. Int J Hyg Environ Health. 2019;222(5):765-77. doi: 10.1016/j.ijheh.2019.05.004
4. Mock CN, Nugent R, Kobusingye O, Smith KR. Injury prevention and environmental health. 3rd ed. Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2017.
5. Ashar MR. Improving student health through PHBS education: strategies, challenges, and future directions for better welfare. Jurnal Riset Kualitatif dan Promosi Kesehatan. 2022;(2):42-56.
6. Haleem A, Javaid M, Asim M, Suman R. Understanding the role of digital technologies in education: a review. Sustain Oper Comput. 2022;3:275-85. doi: 10.1016/j.susoc.2022.05.004
7. Inyang O, Umoh M. Users' perception of print media retention in a digital era. 2021 Jan.
8. Sultan MI. The utilization of digital media in health communication in Indonesia. 2023 Aug:30-1.
9. Giguère A, Zitzelsberger H, Corcoran P, Urquhart C, Légaré F, Grimshaw J, *et al*. Printed educational materials: effects on professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2020;(8):CD004398.
10. Ika G, Winasis S, Pratiwi I, Wildan U. Strengthening digital literacy in Indonesia: collaboration, innovation, and sustainability education. Soc Sci Humanit Open. 2024;10:101100. doi: 10.1016/j.ssaho.2024.101100
11. Snyder JS, Canda E, Honeycutt J, O'Brien LA, Rogers HK, Cumming O, *et al*. Effectiveness of measures taken by governments to support hand hygiene in community settings: a systematic review. J Water Sanit Hyg Dev. 2025:1-19.
12. Okrofa M, Anggarani D, Ainun SN, Wandani A, Rahma M, Nur B. Effectiveness of Clean and Healthy Living Behavior (CHLB) counseling for community empowerment and environmental health improvement: evidence from Malang City. Jurnal Kesehatan Masyarakat. 2023;8(2):143-59.
13. Qaimamunazzala H, Siantoro A, Sirait M, Tanaboleng YB, Daniel D. Household drinking water treatment in rural Indonesia: actual practice, determinants, and drinking water quality. J Water Health. 2023;13(3):208-17.
14. Sareen S, Mandal S. Challenges of blended learning in higher education across global north-south: a systematic and integrative literature review. Soc Sci Humanit Open. 2024;10:101011. doi: 10.1016/j.ssaho.2024.101011
15. Fitzpatrick PJ. 2023 Nov:1-13.
16. Stellefson M, Paige SR, Chaney BH, Chaney JD. Evolving role of social media in health promotion: updated responsibilities for health education specialists. Int J Environ Res Public Health. 2020;17(3):1153.
17. Coombs NC, Campbell DG, Caringi J. A qualitative study of rural healthcare providers' views of social, cultural, and programmatic barriers to healthcare access. BMC Health Serv Res. 2022;22(1):1-16. doi: 10.1186/s12913-022-07829-2
18. Patel M, Gupta EK, Yogesh M. Assessing and comparing knowledge, attitude, and practices related to water, sanitation and hygiene among government and non-government school students in Gujarat: a mixed method study. Int J Community Med Public Health. 2025.
19. Cecconi C, Adams R, Cardone A, Silva M, Vanlerberghe T. Generational differences in healthcare: the role of technology in the path forward. Health Technol (Berl). 2024;(1).
20. Lima JP de, Barlem JGT. Communication strategies to improve older adults' understanding of health information. Rev Esc Enferm USP. 2025;78(Suppl 2):4-7.
21. Mohamed YS, Spaska A, Andrade G, Baraka MA, Ahmad H, Steele S, *et al*. Hand hygiene knowledge, attitude, and practice before, during and post COVID-19: a cross-sectional study among university students in the United Arab Emirates. Infect Prev Pract. 2024;6(2):100361. doi: 10.1016/j.infpip.2024.100361
22. Amaechi DC, Okatta AU, Amaechi EC, Elendu TC, Ezeh CP, *et al*. The impact of simulation-based training in medical education: a narrative review. Niger J Clin Pract. 2024;27(February).
23. Rahmadhani TA, Rozzaqi AR, Khoiri N. Developing web-based learning media for enhancing digital literacy in computer networking. Indones J Educ Dev. 2025;6(3):737-51.
24. Siti E, Masni I, Sianipar J, Rahman A, Koko IW. Advancing the 2030 agenda with community importance-performance perspective and public relations strategies for community-based sanitation. Sustain Futur. 2025;9:100633. doi: 10.1016/j.sftr.2025.100633
25. Buckingham D. Defining digital literacy: what do young people need to know about digital media? Nordicom Rev. 2016 Aug;37(Special Issue):21-35.
26. Alam M, Sharior F, Muhammad D, Hasan M. Hygiene knowledge and practices and determinants of occupational safety among waste and sanitation workers in Bangladesh during the COVID-19 pandemic. Hyg Environ Health Adv. 2022;4:100022. doi: 10.1016/j.heha.2022.100022
27. Myat H, Pholpark A, Thomas L, Lim S, Tsilaajav T, De Oliveira V, *et al*. Health systems financing and purchasing mechanisms of primary health care in Southeast Asia region: findings from a scoping review. SSM Health Syst. 2025;5:100132. doi: 10.1016/j.ssmhs.2025.100132
28. Tsai HY, Lee SYD, Coleman C, Sørensen K, Tsai TI. Health literacy competency requirements for health professionals: a Delphi consensus study in Taiwan. BMC

Med Educ. 2024;24(1):1-11. doi: 10.1186/s12909-024-05198-4
29. Neto V, Martins B, Branquinho A, Figueiras A, Herdeiro MT. Educational interventions for the adoption of healthy lifestyles and improvement of health literacy: a systematic review. Patient Educ Couns. 2025;245:108289.
30. Shahid R, Shoker M, Chu LM, Frehlick R, Ward H, Pahwa P. Impact of low health literacy on patients' health outcomes: a multicenter cohort study. BMC Health Serv Res. 2022;22(1):1-9. doi: 10.1186/s12913-022-08527-9
31. Yi N. Age differences in food safety knowledge, attitudes, and practices among consumers in Seoul. Food Control. 2025;19(3):440-52.
32. Ghahfarokhi ZS. Challenges in health and technological literacy of older adults: a qualitative study in Isfahan. J Health Lit. 2025.
33. Javaid M, Haleem A, Pratap R. Health informatics to enhance the healthcare industry's culture: an extensive analysis of its features, contributions, applications and limitations. Inform Health. 2024;1(2):123-48. doi: 10.1016/j.infoh.2024.05.001
34. Faqihatus D, Has S, Inayah Z, Mindiharto S. Dominant factors affecting the level of awareness of sanitation hygiene implementation in micro, small and medium enterprises. J Environ Health Sci Eng. 2024;3(4):190-200.
35. Forsetlund L, O'Brien MA, Forsén L, Mwai L, Reinar LM, Okwen MP, *et al.* Continuing education meetings and workshops: effects on professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2021;(9):CD003030.
36. Setianti Y, Dida S, Damayanti T, Priyatna CC. Public perception of health information, treatment beliefs, and disease in Indonesia: effective health promotion strategies. Soc Sci Humanit Open. 2025;11(2):101639. doi: 10.1016/j.ssaho.2025.101639
37. Dwivedi YK, Ismagilova E, Hughes DL, Carlson J, Filieri R, Jacobson J, *et al*. Setting the future of digital and social media marketing research: perspectives and research propositions. Int J Inf Manage. 2021;59:102168. doi: 10.1016/j.ijinfomgt.2020.102168
38. Wastira J, Tekad E, Waluyo B. Integrating technology into teaching to foster student engagement and interaction. J Pendidik Teknol Inf. 2025;27(2):464-86.
39. Bose D, Bhattacharya R, Kaur T, Banerjee R, Bhatia T, Ray A, *et al*. Overcoming water, sanitation, and hygiene challenges in critical regions of the global community. Water-Energy Nexus. 2024;7:277-96. doi: 10.1016/j.wen.2024.11.003
40. Leonardi GS, Zeka A, Ashworth M, Bouland C, Crabbe H, Duarte-Davidson R, *et al.* A new environmental public health practice to manage current and future global health challenges through education, training, and capacity building. Environ Health Prev Med. 2024 Nov:1-16.
41. Younie S, Coulson-Smith M, Mitchell B, Coulson-Smith C, Kumaravel A, Kumaravel L, *et al.* Improving young children's handwashing behaviour and understanding of germs: the impact of A Germ's Journey educational resources in schools and public spaces. PLoS One. 2020;15(11):e0242134. doi: 10.1371/journal.pone.0242134
42. Liu L, Tobias GR. The impact of environmental literacy on residents' green consumption: experimental evidence from China. Clean Responsible Consum. 2024;12:100165. doi: 10.1016/j.clrc.2023.100165
43. Wiharto M, Mahadewi EP, Maratis J, Firmansyah A. Disease transmission prevention management of washing hands with soap for students: case study at the University of Jakarta, Indonesia. Jakarta: Universitas Negeri Jakarta; [date unknown]:1294-300.
44. Davies K, Mwenge M, Chipungu J, Dreibelbis R. Understanding end-user preferences for hand hygiene enabling technologies: a mixed-methods study in peri-urban Lusaka. J Water Sanit Hyg Dev. 2024 Oct.
45. Coles E, Anderson J, Maxwell M, Harris FM, Gray NM, Milner G, *et al.* The influence of contextual factors on healthcare quality improvement initiatives: a realist review. Syst Rev. 2020;9(1):1-22.
46. Ode W, Bulan S, Suama IW. The relationship of knowledge, attitudes, and actions of the community with the environmental sanitation of the region fish auction on the coast of Kendari Bay (study of environmental change material class X SMA). J Pendidik Geogr. 2023;2(1):31-46.
47. Nisa K, Aflahah S, Aldeia AMS, Witteveen L, Lie R. Waste management literacy in Indonesian secondary schools: assessing knowledge, attitudes, and behavior. J Environ Educ. 2025;44(2):324-36.
48. Kinoshita S, Hirooka N, Kusano T, Saito K, Aoyagi R. Does health literacy influence health-related lifestyle behaviors among specialists of health management? A cross-sectional study. Health Lit Res Pract. 2024:1-9.
49. Lawrence JJ, Yeboah-Antwi K, Biemba G, Ram PK, Osbert N, Sabin LL, *et al.* Beliefs, behaviors, and perceptions of community-led total sanitation and their relation to improved sanitation in rural Zambia. Am J Trop Med Hyg. 2016;94(4):826-35.
50. Aeschlimann A, Heim E, Killikelly C, Arafa M, Maercker A. Culturally sensitive grief treatment and support: a scoping review. SSM Ment Health. 2024;5:100325. doi: 10.1016/j.ssmmh.2024.100325

How to Cite This Article
Rizki LA, Leksono AS, Batoro J. Effectiveness of media-based health education in strengthening community sanitation knowledge. Int J Multidiscip Res Growth Eval. 2025;6(6):561-566.