

Public Health Education in Random Selected Parts of China, with a Focus on Toilet Sanitation

Hui Xin Loh, Guyana
Texila American University, Singapore

Abstract

Public health education is crucial in addressing sanitation challenges in rural areas, particularly regarding toilet sanitation. This study explores the impact of educational campaigns aimed at promoting better hygiene practices and the adoption of sanitary latrines among communities in various rural settings. We analyzed existing literature through a systematic review approach to evaluate the effectiveness of different education-driven interventions, revealing a significant relationship between targeted educational efforts and improved sanitation behaviours. The results indicate a notable increase in the utilisation of improved toilet facilities and a reduction in the incidence of diarrhea during the study period. Successful educational initiatives included interactive workshops, tailored school programs, and culturally relevant informational materials that resonated with the communities' needs. Key facilitators of these interventions were the involvement of local leaders and health workers, who acted as trusted advocates. However, several barriers were identified, such as entrenched cultural norms, financial constraints hindering toilet construction, and limited access to necessary materials and resources. The findings highlight the need for a multi-sectoral approach to sanitation education, combining efforts from education, health, and policy-making sectors. This research underscores the vital role of comprehensive public health education in fostering sustainable sanitation improvements in underserved regions, pointing to pathways for future initiatives aimed at enhancing public health outcomes and addressing the widespread issue of inadequate sanitation facilities.

Keywords: Community Engagement, Hygiene Education, Rural Areas, Sanitation Behaviours, Toilet Sanitation, Public Health.

Introduction

Access to clean and safe sanitation is essential for public health, particularly in rural areas where inadequate toilet facilities can lead to serious health issues that go beyond mere inconveniences. Poor sanitation practices compromise individual health and place a significant burden on healthcare systems by increasing the incidence of preventable diseases, especially among vulnerable populations such as children and the elderly. The lack of proper sanitation can overwhelm healthcare facilities with patients suffering from sanitation-related illnesses, exacerbating

existing health crises and straining limited resources.

According to the United Nations Sustainable Development Goal 6, ensuring the availability and sustainable management of water and sanitation for all is a global priority that requires urgent attention to improve health outcomes for vulnerable populations. Many rural communities face significant challenges in reaching this goal, often lacking access to improved sanitation facilities. This deficiency exposes them to a range of health issues, including waterborne diseases, malnutrition, and hygiene-related infections.

Unsanitary toilet practices are significant contributors to diseases such as diarrhea, one of

the leading causes of morbidity and mortality in children under five. The implications of inadequate sanitation extend beyond immediate health concerns; they also perpetuate a cycle of poverty and hinder educational progress. Caregivers often have to tend to sick children instead of participating in productive work or supporting educational opportunities, affecting the educational performance of children in unsanitary environments and perpetuating social and economic inequalities.

This paper aims to assess the effectiveness of public health education programs in improving toilet sanitation and hygiene behaviours in rural communities. Through a comprehensive review of existing literature, the study highlights the importance of education in fostering behavior change and reducing health disparities linked to poor sanitation conditions. It addresses the various barriers that obstruct efforts to enhance sanitation in rural settings, revealing the complex nature of sanitation challenges these communities face.

Importantly, the analysis emphasizes the critical role of education in overcoming these obstacles and driving positive health outcomes. The paper reviews the results of various educational interventions aimed at improving sanitation practices, identifies ongoing barriers to effective implementation, and discusses implications for policy formulation and community health strategies necessary for developing sustainable sanitation programs. By integrating educational efforts into broader public health initiatives, stakeholders can effect meaningful change, enhancing the quality of life for rural residents and laying the groundwork for long-lasting improvements in sanitation infrastructure and health equity in underserved areas. Proactive measures in education and advocacy can ultimately transform sanitation landscapes, leading to healthier communities and a more productive society overall.

Methods

The present study did not involve primary experiments; instead, it employed a systematic review approach to aggregate and synthesize findings from existing literature. This comprehensive analysis specifically focused on the impact of public health education on toilet sanitation behaviours in rural contexts. The methodology followed several structured steps to ensure thorough examination and maximize the reliability of the findings.

Literature Search

A systematic search was conducted across multiple academic databases, including PubMed, Scopus, and Google Scholar. Relevant search terms were carefully chosen to encompass a wide range of pertinent articles, incorporating phrases such as "public health education," "rural sanitation," "toilet sanitation," and "hygiene education." Inclusion criteria were explicitly defined to focus on studies published within the last ten years, ensuring the review reflects the current state of research on sanitation challenges and solutions in rural communities.

Selection Criteria

Articles were rigorously screened based on specific selection criteria. Only studies that directly addressed the role of educational interventions in enhancing toilet sanitation or hygiene behaviours were included in the analysis. Additionally, preference was given to studies reporting quantitative outcomes, such as latrine coverage, handwashing rates, or other health outcomes associated with sanitation practices. This focus allowed for a clearer understanding of the measurable impact of public health education on sanitation behaviours.

Data Extraction

Key data points were meticulously extracted from each selected article, including details

on study settings, sample sizes, intervention types, evaluation metrics, and reported outcomes. The objective of this process was to identify common trends, highlight effective strategies used in various educational interventions, and evaluate their influence on sanitation practices in different rural contexts.

Thematic Analysis

The extracted findings were grouped into thematic categories. This thematic analysis centred on four primary areas: the nature of educational interventions, the extent of behavioural changes observed, public health outcomes related to hygiene practices, and barriers encountered during implementation. Organizing the data thematically provided a comprehensive understanding of the effectiveness of public health education and the multifaceted challenges faced in achieving sustainable sanitation improvements in rural areas.

Limitations

The study acknowledged various limitations present in the available literature. Variations in methodology, differences in sample sizes, and contextual factors specific to different regions could all affect the generalizability of the findings. By recognizing these limitations, the study aims to provide a balanced view of the evidence and emphasize the need for ongoing research in this area to validate and expand upon the findings.

Results

Latrine Coverage

Numerous studies have reported significant improvements in latrine coverage following targeted educational interventions. For instance, reports have indicated that the percentage of households adopting improved sanitation facilities increased dramatically from baseline levels to post-intervention [1, 2]. Such

a remarkable rise underscores the immense potential for educational programs to inform and effectively mobilize communities toward adopting healthier practices and improving overall sanitation indicators. The educational interventions often incorporated comprehensive community participation strategies that fostered a collective commitment to enhancing sanitation standards within the community. These strategies included providing information about the health benefits of improved sanitation, as well as techniques for maintaining these facilities after construction.

In practical terms, various workshops and community meetings facilitated important discussions around the numerous benefits of sanitary latrines, which resulted in increased community buy-in and participation in construction initiatives. By hosting interactive sessions where community members could voice their concerns and suggestions, these initiatives were able to create a more inclusive dialogue regarding sanitation practices. This shift in latrine coverage was not only a measure of infrastructural changes, but it also reflected a broader transformation in public attitudes. More families began to prioritize sanitation as an essential aspect of health and well-being, recognizing its importance in disease prevention. Additionally, the role of local leaders in endorsing these programs proved significant, as their influence encouraged community members to engage with and adopt recommended practices. Leaders often participated as role models, demonstrating the advantages of improved sanitation. The integration of local success stories into educational campaigns provided relatable examples that motivated households to transition toward improved sanitation facilities, thereby fostering a culture of health awareness within the community.

Behavioral Changes

Research data synthesis indicated a notable increase in hygiene behaviours, particularly handwashing practices, thereby emphasizing a significant shift in community behaviours as a direct result of effective public health education. Studies that incorporated robust educational components highlighting the importance of hand hygiene in disease prevention reported substantial increases in handwashing frequency. Indeed, most studies documented improvements in handwashing habits, with reported increases following interventions [1]. This suggests that effective public health education does not merely raise awareness but translates into practical behavioural changes among community members.

Initiatives that included hands-on demonstrations of proper handwashing techniques further reinforced these positive changes, encouraging families to adopt improved hygiene practices consistently. The implications of these increases extend beyond individual health, as improved hygiene practices have been shown to contribute significantly to community-wide reductions in infectious disease transmission. Notably, these behavioural changes are critical for building a sustainable culture of health and hygiene within rural communities, leading to positive social norms that further encourage these practices. Furthermore, the involvement of school programs that educated children about hygiene early on provided a foundational platform for instilling lifelong habits, ultimately promoting a healthier future generation. This early education serves as a catalyst for parents to adopt similar practices at home, creating a household environment that values cleanliness and public health.

Public Health Outcomes

A consistent finding across multiple articles was the notable reduction in diarrhoea incidence among children under five,

illustrating the profound impact of these interventions on child health outcomes. Specifically, reports from observational studies highlighted significant decreases in diarrhoea rates, with fluctuating figures after the implementation of targeted hygiene education initiatives [2]. Such substantial reductions in morbidity are critical, given the severe impact of diarrheal diseases on child health and development, which can lead to long-term physical, cognitive, and social impairments.

The correlation between improved sanitation practices and reduced incidence of diarrheal diseases underscores the importance of public health education in creating healthier environments for children. Additionally, these interventions contribute not only to immediate health benefits but also encourage a more expansive perspective on health that encompasses environmental conditions and family practices. Importantly, these programs do not solely address urgent health concerns; they also pave the way for a healthier next generation, significantly altering the trajectory of public health in rural settings. Long-term follow-up studies are essential to assess the sustained impact of these educational interventions and to optimize future programs aimed at enhancing community health.

Identification of Barriers

Despite the successes noted in latrine coverage and hygiene behaviours, the literature consistently identified persistent barriers that hindered progress. Key challenges included:

Financial Constraints

A majority of studies reported that financial limitations were a significant deterrent to adopting improved sanitation practices. Many communities struggle to afford the necessary materials for constructing sanitary latrines, indicating the need for financial support mechanisms to alleviate these economic burdens [3]. This financial barrier highlights the importance of developing subsidy programs

and access to low-interest loans that can facilitate investments in sanitation infrastructure, allowing families to prioritize their health without succumbing to financial strain.

Cultural Norms

Cultural practices and societal norms posed additional obstacles, as some households expressed reluctance to adopt new toilet technologies due to a strong attachment to traditional practices [4]. This resistance signifies the need for culturally sensitive educational approaches that respect local customs.

Discussion

The findings from this literature review underline the critical role of public health education in addressing sanitation challenges in rural China. The substantial improvements in latrine coverage and hygiene practices indicate that targeted educational interventions can lead to meaningful changes in behaviour and health outcomes. This discussion explores the implications of these findings in depth, addressing the importance of community involvement, behaviour change, cultural sensitivity, multi-sectoral partnerships, and actionable recommendations for future practices that can further enhance public health initiatives.

The Importance of Community Involvement: One of the most consistent themes emerging from the analysis is the necessity of community involvement in driving successful interventions. The engagement of local leaders and health workers was paramount in facilitating not only the dissemination of information but also fostering community trust in educational initiatives [5]. This trust is critical as it lays the groundwork for effective communication and participation in public health programs. Community leaders often serve as influential figures [6], helping to bridge gaps between external stakeholders and local

populations. Their involvement ensures that educational content is relevant, culturally appropriate, and tailored to the specific needs of the community, effectively addressing any misconceptions regarding sanitation practices [7]. Moreover, community-driven initiatives specifically foster a sense of ownership among participants, motivating them to take an active role in implementing sanitation improvements and sustaining these efforts over time. This ownership promotes not only immediate action but also long-term commitment to maintaining and enhancing sanitation practices, thereby fostering a culture of health that can thrive even in the absence of ongoing external intervention. Empowering communities to lead their sanitation projects lays a robust foundation for sustainable health improvements and encourages further innovation in public health strategies. Such empowerment can often lead to self-sustaining systems where community members continuously monitor and promote health initiatives, fostering resilience and adaptability in the face of challenges [8].

Behavior Change and Health Outcomes: The observed reductions in diarrhoea incidences serve as compelling evidence of the health benefits stemming from education-driven sanitation improvements. Access to sanitation education empowered communities to make informed choices that ultimately improve public health, particularly among vulnerable populations such as children [9]. The positive correlation between educational interventions and health outcomes emphasizes the need for consistent public health messaging that highlights both the preventative nature of proper sanitation practices and the direct benefits to individual and community health. Public health education should not just focus on the act of improving sanitation infrastructure but must also incorporate teachings on the importance of hygiene, such as regular handwashing, proper food handling, and safe waste disposal, thus creating a comprehensive health literacy that addresses the root causes of

disease transmission. Tailored messaging that communicates the immediate benefits of these behaviours can help reinforce their importance and encourage sustained practice among community members. Furthermore, reinforcing these educational initiatives through regular community events or follow-up workshops can help maintain momentum and ensure that health education remains a continuous priority in the community, effectively instilling these practices as part of daily life [10]. Such sustained engagement fosters an environment where individuals are encouraged to internalize and prioritize hygiene practices, leading to a shift in social norms around sanitation.

Cultural Sensitivity in Education: Addressing cultural norms is essential in navigating the landscape of sanitation in rural settings. The success of educational initiatives is significantly enhanced when they respect and incorporate local customs and beliefs. Research findings indicate that educational materials that resonate with community values and historical practices are more effective in facilitating change [11]. This approach diminishes resistance to new practices, as community members feel that their cultural identity is valued rather than disregarded. Additionally, leveraging local traditions and integrating culturally relevant messages can transform educational campaigns into community celebrations or collective learning experiences, thus fostering a more profound commitment to behavioural change. Engaging community role models, such as respected elders or local advocates, to disseminate information can further enhance receptivity. Moreover, implementing peer education models, where community members teach one another, can significantly reinforce social bonds and foster an environment of collaboration rather than imposition. By creating channels for open dialogue around sanitation practices and cultural values, educators can foster a participatory atmosphere that promotes ownership of health initiatives and lays the

foundation for sustainable behavioural change [12].

Multi-Sectoral Partnerships: The challenges identified in the literature—financial constraints, resource access, and communication gaps—highlight the need for a multi-sectoral approach. Effective sanitation improvements are not solely the responsibility of public health officials; they require collaboration between governmental agencies, NGOs, and local communities. Such partnerships can lead to enhanced resource allocation, where various stakeholders work together to pool their resources and expertise [13]. This collaborative model also promotes the sharing of best practices and innovations, which can be tailored to suit local needs. For instance, governmental support can provide the necessary funding for sanitation infrastructure and education campaigns, while NGOs can offer technical assistance and capacity-building services to local communities. Furthermore, integration across sectors—education, health, housing, and economic development—ensures a holistic approach to sanitation efforts, making sanitation initiatives part of broader strategies that improve overall community well-being. By fostering partnerships that include diverse stakeholders, public health initiatives can become more adaptable and relevant, yielding sustainable improvements in sanitation practices over time [14].

Recommendations for Practice: Based on insights gathered from various studies, several recommendations can be proposed to enhance the effectiveness of public health education in promoting toilet sanitation in rural areas. Firstly, sanitation education should be integrated into formal school curricula, cultivating a new generation that values hygiene and sanitation from a young age. Schools can serve as platforms for not only teaching children about proper sanitary practices but also engaging families through school events and outreach programs. This dual approach can create a supportive environment

that reinforces good habits, thereby encouraging children to champion these practices at home [15]. Secondly, the establishment of governmental subsidies to alleviate financial burdens associated with the construction of sanitary latrines and hygiene facilities is essential. Financial incentives can help offset initial costs, making it more feasible for families to invest in improved sanitation solutions. Such subsidies could include low-interest loans, direct financial grants, or community fund-matching programs that empower individuals and households to prioritize sanitation without placing undue strain on their limited resources. These financial mechanisms can also encourage local entrepreneurs to engage in the sanitation sector, thus promoting job creation and fostering a sense of shared responsibility within the community [16].

Community Engagement and Dialogue

Ongoing community engagement is vital; frameworks should be established for continual dialogue between health officials, local leaders, and community members to assess needs and adapt strategies accordingly. Facilitating regular community meetings or forums can provide valuable opportunities for stakeholders to discuss challenges, share successes, and collaboratively refine educational materials. Engaging the community through such platforms ensures that residents can voice their concerns and suggestions, leading to more tailored interventions and reinforcing the sense of agency and responsibility within the community. Encouraging feedback loops from the community can help ensure that health promotion strategies remain relevant and effective over time. Engaging community members in the evaluation process of sanitation initiatives not only promotes transparency but also fosters trust and a sense of collective ownership over public health efforts [17].

Culturally Tailored Educational Materials

Furthermore, the development of culturally tailored educational materials that resonate with local customs and languages will enhance the effectiveness of educational campaigns. Localization of content should not merely be a matter of translation but should involve adapting messages to reflect the community's values, beliefs, and experiences. For instance, utilizing stories, folklore, and traditional practices within educational content can make sanitation messages more relatable and impactful. Engaging local artists or culturally relevant figures to contribute to campaign materials can also increase their acceptance and effectiveness [18].

Holistic Framework for Sanitation

Overall, public health education serves as a foundational component in tackling the sanitation crisis in rural China. By adopting practices that prioritize community involvement, cultural sensitivity, and multi-sectoral collaboration, stakeholders can build a comprehensive framework that not only addresses immediate sanitation needs but also fosters long-term health improvements. Ensuring that public health education is dynamic and responsive to the evolving challenges faced by communities will be crucial for achieving sustainable sanitation outcomes and improving overall public health in rural China. In this way, educational initiatives can extend beyond mere information dissemination, becoming pivotal tools for social change that empower communities to take charge of their health and environment. This holistic approach ultimately has the potential to create healthy, resilient communities that are well-equipped to tackle future public health challenges.

Conclusion

This extensive review highlights the significant impact of public health education on improving toilet sanitation and hygiene practices in rural China. The analysis indicates

that, despite facing considerable barriers—such as financial constraints, cultural resistance, and limited access to resources—effective educational initiatives can lead to a marked increase in the adoption of improved sanitation facilities. Furthermore, these programs can foster better hygiene behaviours among community members, collectively contributing to the development of healthier communities. The connection between education and behaviour change is critical; as individuals become more knowledgeable about sanitation and hygiene, they are likely to implement healthier practices that benefit not only themselves but also their families and neighbours [19].

To foster sustainable change, stakeholders involved in public health must prioritize community engagement and culturally sensitive education strategies while addressing systemic barriers that hinder progress. Recognizing and honouring local customs and practices will enhance the acceptance of sanitation interventions and create a collaborative atmosphere that encourages behavioural shifts. Ensuring that educational strategies are effective requires ongoing assessment and adaptation to meet community needs adequately [20]. Moving forward, it is essential to incorporate continuous education, as ongoing training and information dissemination are necessary for reinforcing good hygiene practices over time. Additionally, local community participation must be integral to developing and implementing educational campaigns, ensuring that interventions are tailored to meet the specific needs of various groups within the community [21].

Robust policies that support and sustain these educational initiatives are crucial for maintaining momentum in sanitation improvements. Policymakers must work in tandem with health educators and community leaders to create an infrastructure that supports ongoing training and provides necessary resources. The successful application of these

recommendations can contribute significantly to reducing the prevalence of sanitation-related diseases, thereby enhancing overall public health outcomes in rural areas [22]. Strategizing policy initiatives that allocate funding for sanitation programs while simultaneously ensuring community representation in decision-making can lead to more effective implementation and greater accountability [23].

Ultimately, by taking proactive steps toward improving sanitation behaviours through education and community involvement, stakeholders can drive meaningful progress toward achieving the Sustainable Development Goals. This commitment is particularly important in ensuring that all individuals, regardless of socioeconomic status, have access to safe and hygienic sanitation facilities [24]. By prioritizing public health education and community engagement, rural communities can cultivate a culture of health, resilience, and proactive environmental stewardship that ultimately improves the quality of life and health outcomes for future generations [25].

Implications for Policy and Future Research

The findings from this review carry significant implications for policymakers and public health practitioners engaged in sanitation improvement in rural China. A structured approach to addressing the barriers identified in the literature can notably enhance the effectiveness of sanitation programs designed to serve these underserved communities. By implementing targeted strategies that consider local contexts, stakeholders can make meaningful strides toward achieving sustainable sanitation improvements.

Policy Integration

One of the key recommendations is that policies should explicitly support the integration of sanitation education into existing health programs. Such integration can create synergies between various sectors, including

health, education, and community development [26]. By aligning efforts across these areas, policymakers can promote a more comprehensive and structured response to sanitation challenges. For example, incorporating sanitation education into school curricula not only fosters good habits among children but also encourages families to adopt similar practices at home, creating a ripple effect throughout the community. Moreover, collaboration with local health organizations can facilitate workshops and training sessions that empower community members with knowledge about hygiene and sanitation, further reinforcing the importance of these practices in daily life [27].

Funding and Resource Allocation

Policymakers should consider allocating increased resources to rural sanitation initiatives, particularly in areas facing persistent cultural and financial barriers [28]. Given that many rural communities struggle with limited resources, targeted funding can be used to support community-driven construction of latrines and related facilities. Such financial backing can greatly enhance sanitation coverage and ensure that education initiatives are sustainable over time. For instance, introducing subsidized materials for latrine construction or providing financial incentives for households that adopt improved sanitation technologies can encourage more families to participate. Additionally, investment in local infrastructure, such as clean water supply systems, can complement sanitation efforts, creating an integrated framework for public health improvement [29].

Longitudinal Studies

Future research should place greater emphasis on longitudinal studies to better understand the long-term impacts of public health education on sanitation behaviours and health outcomes. These studies should not only assess the initial effectiveness of educational

programs but also examine community retention of knowledge and practices over time [30]. Longitudinal data collection can offer insights into how behaviours evolve and whether the positive changes induced by initial interventions are sustained in the long run. By tracking individuals and households over extended periods, researchers can identify key determinants that facilitate adherence to improved sanitation practices and adapt education strategies based on real-life outcomes.

Evaluation Framework

The establishment of a solid evaluation framework is essential for exploring both quantitative and qualitative outcomes within sanitation programs. This framework will enable more accurate assessments of the interventions' effectiveness, adaptability, and relevance in varying contexts [31]. By systematically collecting data on metrics such as latrine coverage, hygiene practices, and health outcomes, stakeholders can gain valuable insights into what works and what doesn't. Qualitative evaluations, involving community feedback and participation, can lead to richer understandings of cultural perceptions and attitudes toward sanitation, informing future program development. Comprehensive evaluation frameworks empower policymakers to make data-driven decisions and ensure that resources are allocated effectively.

Scalable Strategies

Lastly, exploring scalable strategies for sanitation education can provide important insights into how effective interventions can be applied across various rural regions in China and comparable contexts globally. Identifying best practices and successful models will allow for the expansion of evidence-based approaches to other underserved areas that face similar challenges [32]. For example, adapting successful educational materials and outreach methods to accommodate different cultural or

geographical contexts can enhance the likelihood of widespread acceptance and impact. Additionally, scalability ensures that successful programs are not isolated occurrences but can be implemented broadly to benefit a larger portion of the population, ultimately contributing to the global effort to achieve the Sustainable Development Goals related to water and sanitation [33]. By prioritizing these strategies, policymakers and public health practitioners can foster a more supportive and effective environment for sanitation improvements and public health advancement.

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Conflict of Interest

The author declares that there are no conflicts of interest related to this review article. No financial, personal, or professional relationships have influenced the content, analysis, or conclusions presented in this work.

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