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Sanitation and hygiene interventions in low-resource communities: A comprehensive review of community health nursing approaches

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Abstract
Access to sanitation and hygiene is a cornerstone of public health, yet low-resource communities across the globe continue to face significant challenges in maintaining basic sanitary conditions. In such settings, Community Health Nurses (CHNs) play a pivotal role in promoting hygiene practices, preventing disease outbreaks, and improving overall health literacy. This review paper comprehensively examines various sanitation and hygiene interventions implemented in low-resource communities, with a particular focus on the roles and strategies employed by community health nurses. The paper explores global and regional data on hygiene-related morbidity and mortality, common barriers to effective sanitation interventions, and evidence-based nursing practices that have proven successful. Using a broad spectrum of peer-reviewed literature, government reports, and WHO guidelines, this review synthesizes findings on hand hygiene promotion, menstrual hygiene management, latrine usage behavior, and water sanitation strategies. It critically analyzes challenges such as cultural resistance, infrastructure deficits, and lack of intersectoral coordination, while also showcasing successful models from Africa, South Asia, and Latin America. The contribution of CHNs in health education, household engagement, school outreach, and behavior change communication emerges as a consistent and effective tool for change. The review concludes with recommendations for strengthening nurse-led hygiene interventions, scaling up community-based sanitation models, and integrating hygiene promotion into national public health agendas. This study affirms that empowering community health nurses is essential for advancing sustainable hygiene practices in marginalized communities, and it offers a roadmap for policy-makers and health institutions aiming to reduce hygiene-related disease burdens globally.

Keywords: Community health nursing, hygiene promotion, sanitation, low-resource communities, public health, behavior change, health education

Introduction
Sanitation and hygiene remain central to improving global health outcomes, especially in low-resource communities where access to basic infrastructure is often inadequate. According to the World Health Organization (WHO), nearly 2.3 billion people globally lack access to basic sanitation services, and over 700 million do not have safe drinking water sources (WHO, 2023) [1]. The burden of diseases such as diarrhea, cholera, typhoid, and parasitic infections is disproportionately high in these communities, particularly affecting children under five, pregnant women, and the elderly.

In the context of public health, sanitation refers to the provision of facilities and services for the safe disposal of human urine and feces, while hygiene includes the conditions and practices that help maintain health and prevent the spread of diseases. The close interrelationship between poor sanitation, hygiene, and communicable diseases underscores the need for structured interventions that target behavior change, infrastructure development, and health education.

Community Health Nursing (CHN) has emerged as a vital discipline that addresses the health needs of populations at the grassroots level. Unlike clinical nursing, CHN involves proactive outreach, home visits, school health programs, and public health advocacy. In resource-limited settings, community health nurses often serve as the primary source of health education, disease surveillance, and sanitation advocacy.

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Their work bridges the gap between health policy and health practice, offering culturally competent care and hygiene education that aligns with local contexts.

Despite growing awareness of the importance of sanitation, many communities continue to struggle with open defecation, inadequate hand washing practices, and improper waste disposal. The challenges are multifaceted, involving cultural beliefs, economic limitations, infrastructural inadequacies, and limited governmental engagement. The implementation of community-based sanitation and hygiene interventions has thus become an essential strategy for sustainable health development.

Globally, efforts such as the Sustainable Development Goals (SDGs), particularly Goal 6 - "Ensure availability and sustainable management of water and sanitation for all" - have placed sanitation and hygiene at the forefront of international development. These initiatives recognize the importance of local implementation and the key role played by CHNs in ensuring community participation, monitoring health outcomes, and adapting solutions to fit local needs.

This paper provides a comprehensive review of sanitation and hygiene interventions in low-resource communities, focusing specifically on the approaches, innovations, and outcomes associated with community health nursing. It aims to fill a critical gap in the literature by synthesizing findings from global and regional studies, identifying effective strategies, and offering recommendations for future practices.

The role of community health nurses in sanitation promotion

Community Health Nurses (CHNs) serve as vital links between public health systems and the most underserved populations, particularly in low-resource settings where sanitation and hygiene challenges are deeply rooted. Their role extends far beyond clinical care; they are change agents who bring about sustainable improvements in community health through sanitation promotion and hygiene behavior change. CHNs interact closely with families, schools, and local organizations, and their ability to build trust at the grassroots level gives them a unique advantage in influencing health behavior related to sanitation.

In communities where open defecation, inadequate hand washing, and unsafe waste disposal are common, CHNs often become the primary source of sanitation education. They use health talks, door-to-door visits, participatory meetings, and demonstration methods to explain the importance of clean water use, toilet construction, personal hygiene, and safe waste management. Their health promotion strategies are not generic; they adapt their messaging to local cultural norms, literacy levels, and belief systems, ensuring that community members can understand and act on their recommendations. For example, to promote hand hygiene, a CHN may demonstrate proper hand washing techniques using locally available soap and water, then follow up with regular household visits to reinforce the practice.

This behavioral approach is captured in the visual below, which presents a simplified behavior change cycle driven by CHN interventions. In this model, awareness is the first step, followed by community interest, decision-making, and eventual action. The final stage, maintenance, is supported by continued nurse engagement and reinforcement of positive behaviors.

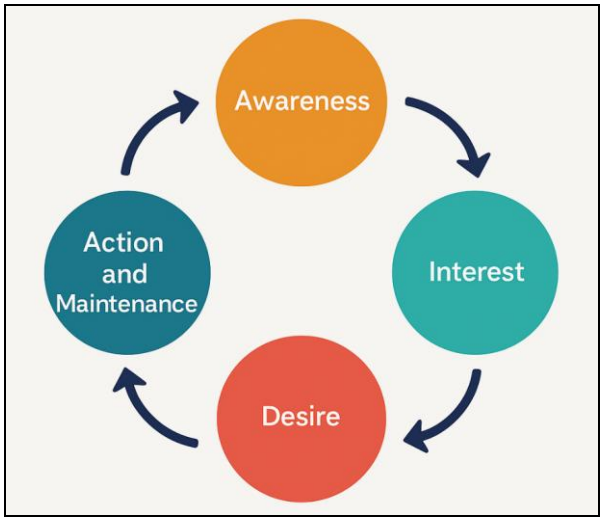

Fig 1: The cycle illustrates how CHNs initiate awareness, stimulate interest, foster desire for change, and support action and maintenance of new sanitation behaviors

In addition to education, CHNs actively monitor sanitation conditions within households. During routine visits, they observe the cleanliness of latrines, availability of soap at handwashing stations, conditions of stored water, and methods of waste disposal. Based on these assessments, nurses provide customized feedback and low-cost solutions tailored to each family's capacity. Research conducted in Kenya indicated that areas served by CHNs saw a 38% improvement in household sanitation scores within six months, underscoring the effectiveness of direct, personalized engagement in sanitation practices.

Schools are also a critical platform for sanitation promotion, and CHNs frequently partner with teachers and administrators to implement hygiene education programs. These include classroom sessions, hygiene clubs, menstrual hygiene workshops, and the establishment of child-friendly handwashing facilities. The outcomes of such efforts are notable; in one program in Bangladesh, CHN-facilitated school interventions led to a 45% reduction in absenteeism caused by hygiene-related illnesses. This collaborative model of school and nurse-led health promotion is demonstrated in the figure below, showing a triangular relationship among CHNs, students, and school staff.

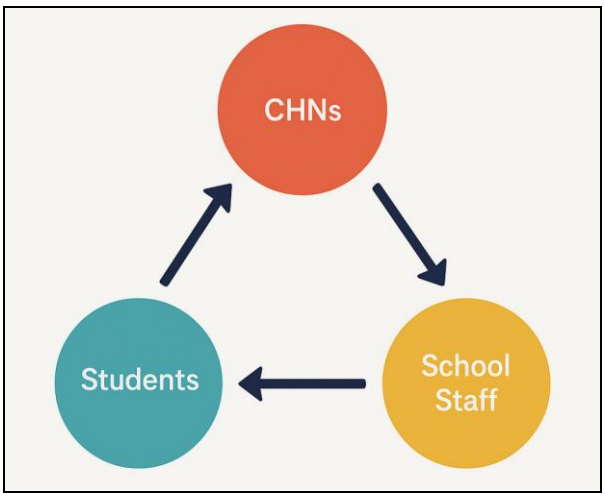

Fig 2: This model shows the interaction between CHNs, students, and school staff in promoting sanitation awareness and behavior change

Another core function of CHNs is to mobilize the wider community to collectively address sanitation problems. In many successful cases, CHNs have led sanitation drives, organized village clean-up days, facilitated participatory mapping of open defecation areas and encouraged the use of toilets built under government schemes. Their advocacy efforts have helped communities achieve Open Defecation Free (ODF) status more quickly. For instance, in Nepal's community-led total sanitation campaigns, villages with CHN involvement were 30% more likely to reach ODF milestones faster than those without such facilitation. This underscores their effectiveness in organizing communities, raising awareness, and inspiring collective responsibility.

CHNs also act as coordinators and liaisons between communities and service providers. Though not directly involved in construction or engineering, they identify gaps in infrastructure and advocate for the provision of toilets, hand washing stations, and safe water facilities. They assist in linking households to government subsidies, connect them with NGOs distributing hygiene kits, and even help train local sanitation volunteers. In areas where services are lacking, the visibility and persistence of CHNs often draw attention to overlooked needs, resulting in targeted support from municipal agencies.

Surveillance is another critical area where CHNs contribute to sanitation promotion. By monitoring signs and symptoms of sanitation-related diseases such as diarrhea, typhoid, skin infections, and worm infestations, CHNs not only provide early treatment but also trigger timely public health responses. Their data collection and reporting help in detecting patterns and preventing outbreaks, especially during seasons of heightened vulnerability, such as monsoons or periods of water scarcity.

Importantly, CHNs approach sanitation with cultural and gender sensitivity. In many settings, topics like menstrual hygiene or toilet use are taboo. Female nurses are often the only trusted source of information for adolescent girls and women on such issues. Their ability to communicate openly and empathetically ensures that delicate subjects are addressed respectfully, promoting both dignity and behavior change.

A powerful example comes from a rural village in Uttar Pradesh, India, where a community health nurse named Meena Devi led a sanitation campaign over six months. Her work included educating families, organizing hygiene demonstration sessions, distributing soaps and sanitary pads, and advocating for latrine construction through government schemes. By the end of the intervention, 75 latrines had been constructed, school absenteeism had dropped by 28%, and open defecation rates fell dramatically-from 60% to just 18%. This example highlights how, when empowered and well-resourced, CHNs can lead transformative health outcomes through community-based sanitation efforts.

In summary, community health nurses are indispensable in promoting sanitation across low-resource communities. Their contributions span education, surveillance, advocacy, coordination, and cultural engagement, all rooted in their close proximity to the people they serve. Their holistic and personalized approach makes sanitation more than a technical solution-it becomes a sustainable, community-owned health behavior. Visual models and field examples only strengthen the understanding that CHNs are not just health workers, but sanitation champions in the truest sense.

Hygiene Interventions in low-resource settings

In low-resource settings, the provision of hygiene interventions is not merely a health strategy it is a life-saving imperative. These communities often face a disproportionate burden of hygiene-related illnesses such as diarrheal diseases, helminth infections, respiratory infections, and skin ailments, which collectively contribute to high morbidity and mortality, particularly among children under five and vulnerable groups such as pregnant women and the elderly. Poor hygiene practices are not only a result of economic deprivation but are also shaped by deeply embedded cultural norms, limited education, and inadequate access to infrastructure. In this context, hygiene interventions must be holistic, culturally appropriate, and community-driven. Community Health Nurses (CHNs) play a pivotal role in the successful implementation of these interventions, acting as the link between policy and practice.

One of the most widespread and fundamental hygiene interventions promoted in low-resource communities is hand hygiene. Handwashing with soap is known to reduce diarrheal incidence by up to 40% and respiratory infections by nearly 25%, according to World Health Organization reports. In practice, however, access to soap and clean water remains limited. Community health nurses address this challenge by demonstrating the critical moments of handwashing-after defecation, before eating, after handling children's feces, and before preparing food. They use locally relevant tools such as songs, visual posters, and practical demonstrations using "tippy taps"-simple, low-cost handwashing stations made with jerry cans or plastic bottles. These are particularly useful in schools and homes without piped water. Through repeated reinforcement during home visits and school sessions, CHNs cultivate sustainable hand hygiene behaviors that are reinforced by peer groups and family structures.

The promotion of safe drinking water and improved water storage practices is another cornerstone of hygiene interventions. In many low-resource communities, especially in rural or peri-urban regions, water is collected from unprotected wells, rivers, or public taps and stored in open containers that are prone to contamination. CHNs educate families about basic water treatment methods, including boiling, filtering, and solar disinfection. They also demonstrate the use of narrow-mouthed storage containers with lids to prevent hand contact and contamination. In collaboration with non-governmental organizations (NGOs), CHNs often distribute household water treatment kits that include chlorine tablets, filter cloths, and handwashing soap. Evidence from multiple studies in Ethiopia, Uganda, and Cambodia demonstrates a significant reduction in waterborne disease cases when such kits are distributed alongside CHN-led education campaigns. These interventions highlight how behavior change, combined with basic resources, can dramatically improve health outcomes.

Menstrual Hygiene Management (MHM) is another vital yet often neglected component of hygiene interventions. In many cultures, menstruation is surrounded by myths and stigma, which discourage open discussion and proper hygienic practices. This results in school absenteeism, reproductive tract infections, and psychological distress among adolescent girls. Community health nurses, particularly female CHNs, are uniquely positioned to address this sensitive issue through culturally competent

communication. They organize awareness sessions in schools and women's groups to educate about the menstrual cycle, the use and safe disposal of sanitary products, and the importance of personal hygiene during menstruation. In resource-constrained areas where disposable sanitary pads are not affordable, CHNs advocate for and demonstrate the use of reusable cloth pads or community-made pads using cotton and banana fiber. In India and Nepal, MHM programs led by CHNs have led to a 30% increase in the use of hygienic menstrual products and a notable reduction in menstruation-related stigma, as reported in UNICEF monitoring data.

Household cleanliness, especially related to food preparation and child care, forms the next critical layer of hygiene interventions. In many low-income homes, cooking is done in poorly ventilated spaces, food is stored without refrigeration, and surfaces are rarely cleaned due to water scarcity. CHNs teach basic cleanliness practices, such as washing fruits and vegetables, covering cooked food, regularly cleaning utensils, and using clean cloths for wiping surfaces. They also emphasize hygiene in baby care-proper cleaning of feeding bottles, use of clean cloth nappies, and frequent washing of hands before feeding children. These messages are often delivered through women's self-help groups, mother's meetings, or during antenatal and postnatal check-ups, ensuring that they are embedded into daily routines.

Another emerging hygiene challenge in low-resource urban settings is the management of solid and liquid waste. Poor garbage disposal, blocked drains, and stagnant water contribute to vector-borne diseases such as malaria and dengue. CHNs collaborate with local sanitation workers, village councils, and health committees to promote proper waste segregation and disposal. They encourage households to separate biodegradable and non-biodegradable waste and to participate in community cleaning drives. In flood-prone regions, they also educate families on how to handle hygiene during water-logging or sewage overflow. Their role extends to educating about safe toilet use and maintenance, especially where shared or community toilets are the only option. They monitor these facilities and report repairs, thus ensuring continued usability.

A key strength of CHN-led hygiene interventions is their adaptability and responsiveness to the local context. In areas where open defecation is a long-standing norm, CHNs initiate discussions without blame or shame. They use community mapping to identify defecation hotspots, conduct transect walks with community leaders, and hold triggering sessions that focus on the health impacts of fecal contamination. These are elements of the Community-Led Total Sanitation (CLTS) approach, which has seen success in multiple Asian and African countries. CHNs play a vital role in guiding these processes and in ensuring that post-ODF (open defecation free) behavior is maintained through ongoing reinforcement and follow-up.

CHNs also facilitate hygiene behavior change through the use of behavior change communication (BCC) strategies. These include interpersonal counseling, flip charts, puppet shows, audio-visual tools, and community drama. For example, in South Sudan, CHNs used interactive puppet shows to teach refugee communities about hand hygiene and safe water storage. In Sierra Leone, community drama led by nurses was used effectively during the Ebola outbreak to promote hygiene practices. Such methods are particularly effective in low-literacy environments, where traditional health leaflets may not be useful.

In settings where resources are extremely limited, CHNs promote low-cost hygiene solutions that can be sustained with community effort. Examples include promoting ash as an alternative to soap, building basic latrines with local materials, and creating handwashing stations from recycled plastic. These practical solutions not only improve hygiene but also foster a sense of ownership among community members, increasing the likelihood of long-term adherence.

Monitoring and feedback are integral to the success of these hygiene interventions. CHNs often maintain household-level records of hygiene practices, disease incidence, and intervention uptake. They use pictorial hygiene checklists to monitor progress and identify areas for reinforcement. These data are reported to primary health centers or district-level officers, forming a critical link in the public health surveillance chain. By providing evidence-based insights from the ground, CHNs ensure that hygiene programs remain responsive to actual community needs.

While hygiene interventions in low-resource settings are constrained by numerous systemic challenges-such as poor infrastructure, financial limitations, and cultural resistance-the persistent and contextualized efforts of community health nurses have yielded significant public health benefits. Their deep understanding of the community, combined with their medical training and communication skills, positions them as key facilitators of hygiene transformation.

Challenges in implementing hygiene interventions

Implementing hygiene interventions in low-resource settings presents a complex interplay of structural, cultural, behavioral, and logistical challenges. While Community Health Nurses (CHNs) have emerged as vital agents in promoting hygiene practices, their work is often hindered by a wide array of barriers that limit both the reach and sustainability of sanitation-related behavior change. Understanding these challenges is essential for developing more robust and adaptable intervention strategies.

One of the most persistent challenges is the lack of adequate infrastructure to support hygiene behaviors. Many low-income or marginalized communities lack basic amenities such as clean water, functional toilets, drainage systems, and waste disposal facilities. Even the most well-intentioned hygiene education will have limited impact if households do not have access to water for handwashing, soap, or private sanitation facilities. Community health nurses, who often emphasize practices like regular handwashing or menstrual hygiene, face the paradox of promoting behaviors that may not be logistically feasible for the people they serve. For instance, recommending handwashing with soap before meals or after defecation becomes unrealistic in areas where water is scarce or must be fetched from long distances.

Compounding the infrastructural barriers are deeply rooted socio-cultural norms and traditional practices that resist change. In many communities, behaviors related to sanitation and hygiene are not governed purely by knowledge, but by beliefs, taboos, and inherited customs. Practices such as open defecation, communal water storage, or concealment of menstrual hygiene are often normalized through generations. Attempts by CHNs to introduce change may be met with skepticism, mistrust, or outright rejection. Cultural sensitivity and long-term engagement are essential in these cases, but such an approach requires time, patience,

and continued presence-luxuries that overstretched community nurses often cannot afford.

Another considerable hurdle is the limited training and resources available to CHNs themselves. In many low-resource countries, community health nurses are expected to address a wide array of health issues including maternal care, immunization, disease surveillance, and nutrition, with hygiene often relegated to a secondary priority. Formal training programs may not include comprehensive modules on sanitation promotion, behavioral change communication, or the use of tools like hygiene audits and visual aids. Moreover, a lack of transportation, personal protective equipment, printed materials, and logistical support restricts their ability to reach distant or difficult-to-access households. In some cases, nurses even pay out-of-pocket to travel to communities or to provide essential hygiene products like soap or sanitary pads.

The role of gender in hygiene promotion presents a nuanced challenge. While female CHNs are often more effective in discussing topics like menstrual hygiene or household cleanliness with other women, they may face safety concerns when working in male-dominated or conservative areas. Additionally, in certain cultural contexts, men may dismiss hygiene messages delivered by women, limiting the acceptance of interventions among male heads of households who often control family decisions. Conversely, male CHNs may struggle to effectively engage with female beneficiaries on sensitive hygiene matters. This dynamic requires careful recruitment, training, and deployment strategies that match personnel to community contexts in culturally appropriate ways.

Political and administrative factors also influence the success or failure of hygiene interventions. Inconsistent funding, weak policy implementation, bureaucratic red tape, and poor coordination among different government departments can stall or distort hygiene programs. For example, while the Ministry of Health may promote hygiene education, the Ministry of Water and Sanitation may delay the construction of latrines or water systems due to unrelated priorities. Such fragmentation undermines the holistic approach required for effective hygiene promotion. CHNs operating at the community level often have little influence over such systemic issues, leaving them to manage expectations and frustration among community members who may perceive the nurse as a representative of all failed services.

Monitoring and evaluation of hygiene interventions is another area where implementation often falters. Without clear data collection mechanisms, it becomes difficult to assess behavior change, track the incidence of hygiene-related diseases, or modify strategies based on feedback. Many CHNs are not equipped with mobile devices, software tools, or training in data management. Paper-based reporting is time-consuming and prone to errors, and the lack of integration with larger health information systems means that valuable grassroots insights may never inform district-level decisions.

Furthermore, community fatigue and dependency on external support present long-term sustainability concerns. Hygiene programs that rely heavily on free distributions-such as soap, sanitary pads, or water containers-may achieve initial compliance but fail to foster intrinsic motivation for behavioral change. Once external support is withdrawn, communities often revert to prior practices. CHNs must balance between facilitating immediate behavior change and nurturing a sense of ownership and responsibility within the community. This often involves introducing cost-sharing models, local resource mobilization, and peer education systems that can continue functioning independently of institutional presence.

Emergencies and natural disasters exacerbate all of these challenges. Floods, droughts, and disease outbreaks not only disrupt hygiene infrastructure but also divert government attention and resources away from long-term interventions. During such periods, CHNs are overburdened with urgent clinical responsibilities, and hygiene promotion becomes a secondary priority. Yet it is precisely during these times that hygiene interventions are most critical in preventing outbreaks of waterborne and communicable diseases. The lack of emergency preparedness, shortage of supplies, and limited surge capacity within the CHN workforce often lead to missed opportunities for prevention.

Despite these challenges, it is important to note that many of them are not insurmountable. Strategic investments in training, cross-sector collaboration, technology integration, and community empowerment can significantly improve the effectiveness and resilience of hygiene interventions. CHNs, with their deep community connections and trust, are uniquely positioned to implement these strategies-provided they receive the necessary institutional support and resources.

In conclusion, while community health nurses are at the forefront of hygiene promotion in low-resource settings, their efforts are often constrained by a web of cultural, infrastructural, administrative, and resource-related challenges. Acknowledging these barriers is the first step toward designing more effective, context-sensitive interventions. Empowering CHNs through education, logistics, policy backing, and interdepartmental coordination can transform them from overstretched service providers into catalysts for lasting sanitation behavior change.

Comparative analysis of global and local interventions

Sanitation and hygiene interventions vary widely across countries and regions, shaped by differing cultural contexts, governance structures, health system capacities, and economic resources. While the core objectives of such interventions-improved health, behavior change, and disease prevention-are universally shared, the methods and outcomes differ significantly between global (often externally funded and coordinated) interventions and locally driven, community-rooted strategies. A comparative analysis of these interventions provides insights into what works, under what circumstances, and how community health nurses (CHNs) adapt their roles in each context to maximize impact.

Globally coordinated hygiene interventions, often led by international organizations such as the World Health Organization (WHO), UNICEF, and large non-governmental organizations (NGOs), typically adopt standardized approaches based on best practices and evidence-based models. These interventions emphasize hand hygiene, water safety, menstrual hygiene management, and sanitation infrastructure development. Examples include UNICEF's WASH (Water, Sanitation and Hygiene) programs in Sub-Saharan Africa and South Asia, and WHO's Global Handwashing Day campaigns. These programs often come with extensive resources, technical

guidance, and cross-border collaboration. They introduce tools like tippy taps, water purification tablets, latrine design guidelines, and hygiene promotion kits that are disseminated across multiple countries with contextual adaptations. Community health nurses within these frameworks often receive specialized training and materials, allowing them to deliver uniform messages aligned with international standards.

However, these globally structured interventions sometimes struggle with long-term sustainability when local ownership is insufficient or when external funding ends. In many cases, interventions are initiated by external agencies but lack continuity once the pilot phase concludes. The challenge is particularly acute in remote and underserved regions where government follow-up is weak. CHNs often express frustration when trained in a hygiene model they cannot sustain due to lack of soap supplies, transport, or local administrative support. Without continuous monitoring or the empowerment of local leadership, hygiene behaviors promoted during international campaigns may revert after the intervention cycle ends.

In contrast, locally designed and community-driven hygiene interventions tend to be more culturally rooted, participatory, and often more sustainable, albeit with limited reach and resources. These programs usually evolve organically from community needs, facilitated by CHNs or local health workers familiar with the language, beliefs, and practices of the population. In several South Asian and East African countries, community-led total sanitation (CLTS) campaigns exemplify this model. These interventions avoid subsidies and instead focus on triggering collective behavioral change through emotional drivers such as shame, pride, and community responsibility. Community health nurses are integral to such efforts-not only educating but mobilizing, mapping, and tracking community-wide changes in hygiene practices.

One key advantage of local interventions is their adaptability. Rather than applying a one-size-fits-all model, local hygiene initiatives reflect variations in geography, climate, economy, and culture. For example, while a global program may promote chlorination of water, a locally tailored approach in rural Nepal may advocate for boiling water using traditional clay stoves and educate on proper storage methods using narrow-necked pots. Similarly, in parts of Northern Nigeria, CHNs collaborate with Islamic leaders to disseminate hygiene messages during Friday prayers, leveraging religious platforms to shift attitudes toward open defecation or menstrual hygiene.

Another striking difference lies in how success is measured. Global interventions often use standard indicators such as the number of latrines built, soap distribution coverage, or disease incidence reduction. These metrics, while important, may overlook nuanced shifts in attitudes, knowledge, or habits that CHNs working locally are better able to observe and report. Locally driven programs tend to rely more on community feedback, observational tools, and informal assessments. Although less statistically rigorous, such methods offer a more immediate and realistic picture of behavior change.

There are also significant differences in how CHNs are supported within global versus local frameworks. In global projects, nurses often benefit from structured capacity building, periodic refresher training, and technical supervision. In contrast, locally supported CHNs may have greater autonomy but less formal training or material support. This autonomy, however, often leads to creative, context-specific solutions. In Bolivia, for instance, CHNs leading a locally funded hygiene initiative adapted education materials using native Quechua terms and illustrations drawn by schoolchildren. The participatory nature of the intervention not only increased comprehension but fostered community ownership, which sustained the program well beyond its initial funding period.

Importantly, several successful interventions have emerged from hybrid models that combine global expertise with local engagement. Programs that involve international technical support but are co-designed and led by community nurses and leaders tend to demonstrate both effectiveness and longevity. For example, Ethiopia's Health Extension Program integrates CHNs into a national system backed by global development agencies, yet emphasizes door-to-door engagement and culturally relevant education rooted in village norms. Similarly, India's Swachh Bharat Mission (Clean India Campaign) involved central policy and international attention, but its execution relied heavily on the mobilization of Accredited Social Health Activists (ASHAs) and community nurses working at the grassroots level.

In summary, while globally driven hygiene interventions bring scale, funding, and technical rigor, they often struggle with contextual relevance and sustainability. Conversely, locally grounded interventions benefit from cultural alignment and community trust, though they may lack resources and standardization. Community health nurses play a bridging role in both models, translating policy into practice and global guidance into locally acceptable behaviors. The most impactful hygiene interventions are those that harmonize global strategies with local realities, guided by the frontline experiences of CHNs who understand not just the science of hygiene, but the humanity behind it.

Conclusion

Sanitation and hygiene are foundational components of public health, especially in low-resource communities where the burden of preventable diseases remains high and persistent. This review has examined the landscape of hygiene interventions through the lens of community health nursing, highlighting the multifaceted roles that CHNs play in planning, implementing, and sustaining hygiene promotion activities in marginalized populations. From household-level hygiene education to community mobilization and disease surveillance, community health nurses serve as essential agents of change, bridging the gap between health systems and the realities on the ground.

Despite severe infrastructural limitations, cultural taboos, and systemic underfunding, CHNs continue to implement effective and adaptive hygiene interventions. Their proximity to communities and trust among local populations uniquely position them to deliver context-sensitive health education, identify behavioral challenges, and advocate for practical sanitation solutions. Through case examples and global comparisons, it is evident that CHNs not only disseminate information but also actively contribute to behavior change, encourage community ownership, and facilitate intersect oral collaboration.

However, the challenges faced by CHNs-including limited training, lack of resources, and weak policy integration-

highlight the urgent need for structural support. Investing in CHN capacity building, integrating hygiene into national nursing curricula, and ensuring robust monitoring frameworks are essential steps to scale up their impact. Furthermore, harmonizing global hygiene strategies with culturally grounded, locally owned interventions is vital to achieving sustained behavior change.

Ultimately, sanitation and hygiene promotion cannot be separated from the broader goals of equity, empowerment, and human dignity. In the journey toward universal health coverage and the fulfilment of Sustainable Development Goals, community health nurses remain indispensable partners. Strengthening their role within public health frameworks will not only improve hygiene practices but also uplift the health, well-being, and resilience of the world's most vulnerable communities. The evidence is clear: where CHNs are equipped, supported, and empowered, sanitation outcomes improve, and lives are saved.

Conflict of Interest
Not available

Financial Support
Not available

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