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Effectiveness of Clean and Healthy Living Behavior (CHLB) Counseling for Community Empowerment and Environmental Health Improvement: Evidence from Malang City

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Abstract

Improving public health is a priority in urban development strategies, including in Malang City. This study evaluates the effectiveness of Clean and Healthy Living Behavior (CHLB) counseling as a community empowerment intervention to enhance knowledge, attitudes, and practices of local residents. A descriptive qualitative approach was employed, using observations, in-depth interviews, and focus group discussions (FGDs) involving 60 households and primary school students in Lowokwaru District, Malang City. The findings reveal a significant improvement in handwashing practices, proper latrine use, and household waste management. Moreover, community participation in collective environmental activities increased, contributing to a cleaner neighborhood and a reduction in environmentally related diseases. At the school level, students displayed strong enthusiasm and incorporated healthy habits into their daily routines. These behavioral changes also generated socioeconomic benefits, including reduced household health expenditures. The results provide empirical evidence that CHLB counseling is an effective community empowerment strategy for improving public health and environmental quality. Scaling up similar programs with strong support from local government, educational institutions, and active community participation is recommended to transform CHLB into a sustainable lifestyle.

Article Info

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1. Introduction

Public health remains one of the most critical determinants of sustainable urban development. Rapid urbanization, coupled with increasing population density and mobility, has created complex health challenges in cities across the globe. The World Health Organization (WHO, 2022) emphasizes that urban environments shape health outcomes by influencing sanitation, housing, water quality, air pollution, and access to health information and services. As cities expand, they often face a double burden of disease: the persistence of communicable diseases such as diarrhea, respiratory infections, and vector-borne illnesses, alongside a rising prevalence of non-communicable diseases driven by lifestyle factors. Addressing these challenges requires comprehensive and inclusive health promotion strategies that mobilize communities to adopt and maintain preventive behaviors.

Malang City, located in East Java Province, Indonesia, is a rapidly developing urban center and a recognized hub of education and tourism. Its population growth and high mobility make it both vibrant and vulnerable. According to the Central Bureau of Statistics (BPS, 2023), Malang City's population density exceeds 7,000 people per square kilometer, which can amplify health risks when clean water access, waste management, and hygiene practices are insufficient. The city has made progress in promoting Clean and Healthy Living Behavior (CHLB) known locally as *Perilaku Hidup Bersih dan Sehat (PHBS)* a set of ten health indicators promoted nationally by the Indonesian Ministry of Health. These indicators include washing hands with soap, using proper sanitation facilities, consuming safe water and nutritious food,

maintaining clean housing, engaging in physical activity, and accessing health services. CHLB is considered a cornerstone of Indonesia's preventive health strategy because it empowers individuals and families to manage their own health proactively (Kemenkes RI, 2011).

Despite these national and local initiatives, the implementation of CHLB in Malang City remains suboptimal. Data from the Malang City Health Office (Dinkes Kota Malang, 2023) indicate that only 47.3% of households meet the full set of CHLB indicators, which is significantly below the national target of 70% by 2025 (Kemenkes RI, 2020). This gap has direct implications for public health outcomes. The city still reports a high prevalence of environmentally related diseases, including 3,417 cases of diarrhea in children under five and more than 18,000 cases of acute respiratory infections (ISPA) in 2022 alone. These preventable illnesses not only reduce quality of life but also impose economic burdens through increased medical expenses, lost productivity, and absenteeism from school and work.

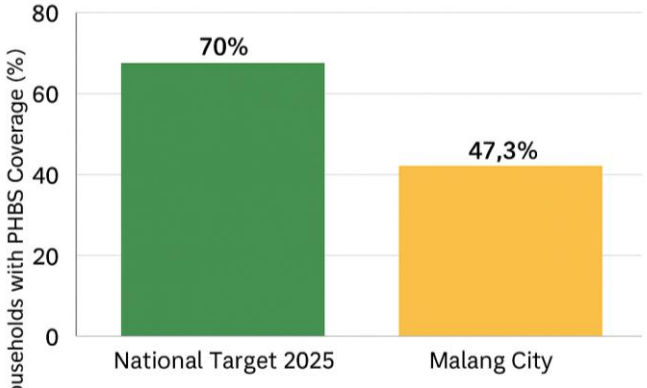

Figure 1 illustrates the considerable gap between Malang City's current CHLB coverage and the national target, highlighting the urgency for effective community-based health interventions.

Source: Malang City Health Office (2023), Ministry of Health (2020)

Figure 1. The considerable gap between Malang City's current CHLB coverage and the national target, highlighting the urgency for effective community-based health interventions.

The persistence of this gap between knowledge and practice reflects broader structural and behavioral barriers. Studies have shown that many communities continue to view CHLB as a government program to be complied with rather than a personal or collective necessity (Prasanti & Fuady, 2017). This perception limits intrinsic motivation and weakens long-term adherence. Moreover, health literacy levels in certain neighborhoods remain low, particularly among older adults and lower-income households. Research by Raksanagara and Raksanagara (2015) highlights that health behavior is shaped not only by knowledge but also by environmental cues, social norms, and economic constraints. For example, families living in informal settlements may lack access to safe water or proper sanitation facilities, making it difficult to practice CHLB consistently even if they understand its importance.

In addition to structural constraints, cultural factors also play a role. In some communities, open waste disposal, smoking inside the house, or irregular handwashing remain culturally tolerated behaviors, which can hinder health promotion efforts. This aligns with behavioral science research suggesting that long-standing habits are resistant to change without sustained social reinforcement and enabling environments (Nutbeam, 2008). Consequently, one-off information campaigns may not be sufficient to drive meaningful behavioral change.

campaigns may not be sufficient to drive meaningful behavioral change. Given these multifaceted challenges, there is growing recognition that health promotion must go beyond top-down information dissemination. Community empowerment has emerged as a critical approach to improving health behaviors. The concept of community empowerment involves enabling individuals and groups to gain control over the determinants of their health through participation, capacity building, and collective action (Laverack, 2017). By involving community members as active partners rather than passive recipients, empowerment strategies foster a sense of ownership and accountability. Evidence from global health literature suggests that community-based interventions—such as peer education,

participatory workshops, and neighborhood campaigns—are more effective at sustaining behavioral change than didactic, one-way communication (Wallerstein et al., 2015).

CHLB counseling, when designed with a participatory approach, has the potential to function as both an educational and mobilizing tool. It not only conveys information but also engages participants in dialogue, encourages peer learning, and builds social capital that supports collective action. Previous studies in other Indonesian cities have demonstrated that such programs can improve handwashing practices, reduce open defecation, and increase participation in waste management activities (Minarni, Utami, & Prihatiningsih, 2017). However, there is limited empirical research specifically evaluating the effectiveness of CHLB counseling within the unique socio-cultural and infrastructural context of Malang City.

This gap in the literature raises several important questions: Can CHLB counseling effectively shift health knowledge into concrete daily practices among Malang City residents? How do households and school-age children respond to counseling interventions, and what factors facilitate or hinder their adoption of CHLB behaviors? Can these micro-level changes contribute to broader improvements in environmental health? Addressing these questions is crucial not only for local policy but also for national efforts to accelerate progress toward the 2025 PHBS targets.

Therefore, this study was undertaken to evaluate the effectiveness of CHLB counseling as a community empowerment intervention aimed at improving knowledge, attitudes, and behaviors related to clean and healthy living in Malang City. By focusing on both household and school settings, the study seeks to provide a comprehensive understanding of how counseling can act as a catalyst for behavioral change and environmental health improvement. The results of this research are expected to contribute to evidence-based policymaking and to inform future health promotion programs designed to close the gap between awareness and sustained practice.

2. Methods

This study adopted a descriptive qualitative design to examine the effectiveness of Clean and Healthy Living Behavior (CHLB) counseling as a community empowerment strategy in Malang City. A qualitative approach was chosen because it allows for an in-depth exploration of participant experiences, perceptions, and behavior within their real-life context, making it particularly suitable for public health intervention research (Creswell & Poth, 2018).

The research was conducted in Lowokwaru District, which was selected purposively due to its relatively low CHLB compliance rate—only 47.3% of households met the indicators—well below the national target of 70% set by the Ministry of Health for 2025 (Kementerian Kesehatan RI, 2020). A total of 60 households and two primary schools were included, representing a diverse range of socio-economic conditions to provide a comprehensive view of community practices. Participants were recruited using purposive sampling, a strategy commonly applied in qualitative studies to ensure the inclusion of information-rich cases relevant to the research objectives (Patton, 2015).

The intervention consisted of two interactive counseling sessions for community members, each lasting approximately 90 minutes and focusing on key CHLB components: proper handwashing, safe sanitation practices, and household waste management. School-based activities, including demonstrations and role-play exercises, were also implemented to encourage students to adopt healthy habits early. Printed educational materials and posters were distributed to reinforce messages and act as visual cues within households and schools.

Data were collected over a two-month period using multiple techniques—direct observation, in-depth interviews, and focus group discussions (FGDs)—to capture both individual and collective experiences and to enable triangulation (Carter et al., 2014). Observations recorded visible behavioral changes in household and school environments, interviews elicited detailed personal perspectives from household heads, teachers, and community health workers, while FGDs provided insight into shared attitudes, motivations, and perceived barriers to CHLB adoption.

Data analysis followed the interactive model of Miles, Huberman, and Saldaña (2014), which involves three concurrent stages: data reduction through coding, data display using thematic matrices, and drawing and verifying conclusions through iterative reflection. To ensure

trustworthiness, the study applied source and method triangulation, conducted member checking by returning preliminary findings to participants for confirmation, and engaged in peer debriefing with public health experts to validate thematic interpretations (Lincoln & Guba, 1985). Ethical considerations were addressed by obtaining informed consent from all participants, guaranteeing confidentiality, and anonymizing all identifiable data prior to analysis.

3. Results asnd Discussion

Result

The findings of this study are presented in four thematic clusters that emerged from observation, in-depth interviews, and focus group discussions: (1) improvement of health knowledge and awareness, (2) adoption of CHLB practices at the household level, (3) reinforcement of healthy behaviors through school-based education, and (4) community participation in collective environmental actions. Each theme is supported by direct participant quotations and observational data, offering a comprehensive portrayal of behavioral change following the CHLB counseling intervention.

Improvement of Health Knowledge and Awareness

A central outcome of the CHLB counseling program was the significant increase in participants' knowledge and awareness regarding hygiene, sanitation, and environmental health. During the pre-intervention assessment, knowledge surveys revealed that only 38% of respondents could correctly identify the five critical moments for handwashing recommended by the Ministry of Health: before eating, before food preparation, after defecation, after cleaning a child, and after handling waste. Many respondents reported that they washed their hands "only when visibly dirty" and were unaware of the importance of washing hands before handling food.

One participant candidly shared:

"Saya dulu cuci tangan hanya kalau mau sholat atau kalau tangan terasa lengket. Tidak tahu kalau seharusnya sebelum menyiapkan makanan." (YL, 30 tahun).

"I used to wash my hands only when I wanted to pray or when my hands felt sticky. I didn't know that I should wash my hands before preparing food." (YL, 30 years old).

Counseling sessions provided clear demonstrations of proper handwashing techniques, accompanied by visual aids and discussions about the health risks of neglecting hygiene. Participants reported that these demonstrations helped them understand the connection between germs, dirty hands, and diseases such as diarrhea and intestinal worms.

"Penyuluh menjelaskan tentang kuman pakai gambar mikroskop. Saya baru sadar ternyata kuman bisa menyebabkan sakit perut dan menular ke anak-anak." (AR, 28 tahun).

"The instructor explained about germs using microscope images. I just realized that germs can cause stomachaches and be transmitted to children." (AR, 28 years old).

The interactive nature of the sessions was particularly impactful. Rather than passively receiving information, participants were invited to practice the steps of handwashing, discuss common barriers, and share their experiences. This participatory approach fostered a sense of engagement and personal relevance.

By the end of the program, post-test assessments showed that 82% of respondents could name all five critical handwashing moments, more than double the baseline. Knowledge about safe sanitation also improved markedly, with 93% of participants acknowledging the risks of open defecation compared to 71% before the intervention. Waste management awareness increased as well, as participants learned about the link between unmanaged waste, mosquito breeding sites, and vector-borne diseases such as dengue fever.

During focus group discussions, participants expressed surprise at how small habits could have major health impacts:

"Ternyata membuang sampah sembarangan bisa jadi sarang nyamuk. Setelah tahu, saya jadi lebih hati-hati." (SP, 42 tahun).

"It turns out that littering can become a breeding ground for mosquitoes. After learning this, I became more careful." (SP, 42 years old).

Participants also appreciated that the counseling linked health practices to financial consequences. Facilitators discussed how frequent illness leads to medical expenses and lost workdays, resonating strongly with households.

"Kalau anak sakit, saya harus izin kerja dan beli obat. Jadi saya sadar lebih baik mencegah daripada mengobati." (HS, 36 tahun).

"When my child is sick, I have to take time off work and buy medicine. So I realize it's better to prevent than to cure." (HS, 36 years old).

Interestingly, knowledge gains were not limited to adults. Several teenagers who attended the sessions expressed pride in being able to teach younger siblings:

"Saya ajari adik cara cuci tangan yang benar, seperti yang diajarkan penyuluh." (RA, 14 tahun).

"I teach my younger sibling how to wash their hands properly, as taught by the extension worker." (RA, 14 years old).

Overall, these results demonstrate that the CHLB counseling successfully bridged the gap between general awareness and specific, actionable knowledge. The combination of visual materials, practical demonstrations, and two-way discussions appears to have facilitated a deeper understanding and internalization of health concepts, laying a strong foundation for sustained behavioral change.

Adoption of CHLB Practices at the Household Level

One of the most striking outcomes of the intervention was the transformation of hygiene and sanitation practices within households. Prior to the counseling sessions, baseline observations showed that fewer than half of the participating households (47%) had soap available at their primary handwashing location, and only 35% of households reported washing hands at all five critical times recommended by the Ministry of Health—before eating, before preparing food, after defecation, after cleaning a child, and after handling waste. These figures highlight a significant gap between awareness and practice that the counseling aimed to address.

Two months after the intervention, follow-up observations revealed a remarkable shift. The proportion of households with soap and clean water available near handwashing areas had increased to 85%. During household visits, researchers observed that many families had created designated handwashing spots using simple tools such as plastic containers with taps (ember kran). As one father explained:

"Sebelumnya cuci tangan hanya kalau ingat atau kalau tangan kotor. Setelah ikut penyuluhan, saya buat tempat cuci tangan di dekat dapur pakai ember bekas. Jadi sekarang semua anggota keluarga bisa cuci tangan sebelum makan." (RN, 41 tahun).

"Previously, I only washed my hands when I remembered or when my hands were dirty. After attending the educational session, I made a hand washing station near the kitchen using an old bucket. So now all family members can wash their hands before eating." (RN, 41 years old).

Similarly, mothers reported paying closer attention to their children's hygiene routines. In interviews, several mentioned that handwashing before meals had become a family habit.

"Saya senang karena anak-anak sekarang langsung ingat cuci tangan. Kadang malah mereka yang mengingatkan saya." (AI, 27 tahun).

"I'm happy because the children now remember to wash their hands right away. Sometimes they even remind me." (AI, 27 years old).

"Biasanya susah menyuruh anak-anak cuci tangan, tapi sekarang mereka semangat karena sudah belajar caranya di sekolah." (MR, 35 tahun).

"It's usually difficult to get children to wash their hands, but now they are enthusiastic because they have learned how to do it at school." (MR, 35 years old).

Latrine usage also improved significantly. At baseline, 8% of households admitted occasional open defecation or using unimproved facilities due to limited access or damaged latrines. Post-intervention, 99% of households consistently reported latrine use, and several families repaired or upgraded their facilities. One respondent described the motivation to make these improvements:

"Saya perbaiki jamban yang rusak supaya bisa dipakai lagi. Setelah tahu risikonya, saya tidak mau anak-anak sakit karena buang air sembarangan." (WS, 38 tahun).

"I repaired the broken toilet so it could be used again. After learning about the risks, I don't want my children to get sick from defecating in the open." (WS, 38 years old).

Waste management practices saw a similar transformation. At the beginning of the study, most households disposed of mixed waste in open bins or directly into drainage canals. Only 21% reported separating organic and non-organic waste. After the intervention, 68% of households began practicing waste separation at source, with some even starting composting for organic waste. Community health workers noted that this change reduced foul odors and fly infestations.

"Dulu semua sampah dibuang jadi satu. Sekarang sudah mulai dipisahkan, dan sampah plastik dikumpulkan untuk dijual. Lumayan bisa jadi tambahan uang." (LN, 32 tahun).

"In the past, all trash was thrown away together. Now it is separated, and plastic waste is collected to be sold. It's a nice little extra income." (LN, 32 years old).

These behavioral improvements were corroborated by FGD participants, who reported fewer flies in their kitchens and a perceived decrease in diarrheal episodes among children. One mother emphasized the economic benefit of fewer illnesses:

"Sebelum penyuluhan, hampir setiap bulan beli obat diare. Sekarang sudah jarang, jadi uang bisa dipakai untuk beli susu." (WN, 29 tahun).

"Before the counseling, I bought diarrhea medicine almost every month. Now it's rare, so I can use the money to buy milk." (WN, 29 years old).

Table 1. below summarizes the before-and-after changes observed at the household level:

Practice	Baseline	Post-Intervention	Change
Soap available at handwashing station	47%	85%	+38%
Handwashing at 5 critical times	35%	79%	+44%
Consistent latrine use	92%	99%	+7%
Household waste separation	21%	68%	+47%

Overall, these results demonstrate that CHLB counseling effectively translated health knowledge into tangible behavioral changes. The combination of participatory learning, visual demonstrations, and continuous reinforcement encouraged families to adopt sustainable hygiene practices. The visible improvement in household facilities and routines suggests that behavior change was not merely temporary compliance but a shift toward a new social norm within the community.

Reinforcement through School-Based Education

Schools played a pivotal role in reinforcing CHLB messages and turning them into sustained daily habits among children. During the baseline assessment, direct classroom observations revealed that only 35% of students washed their hands before meals or recess, and many used handwashing stations without soap. Teachers admitted that health education was not consistently integrated into daily school routines due to limited time and competing curriculum demands.

After the CHLB counseling program, a marked transformation was observed in student behavior and school culture. The intervention included interactive demonstrations, role-play activities, and storytelling sessions designed to engage children in a fun and memorable way. Teachers reported that these activities sparked enthusiasm and created a peer-to-peer reinforcement effect:

"Setelah kegiatan praktik cuci tangan, anak-anak justru saling mengingatkan. Mereka membuat lagu sendiri supaya teman-temannya ingat kapan harus cuci tangan." (Teacher, SDN Lowokwaru 02)**.**

"After the handwashing practice activity, the children reminded each other. They made up their own song so that their friends would remember when to wash their hands". (Teacher, SDN Lowokwaru 02).

"Kami melihat anak-anak yang biasanya cuek, sekarang malah menjadi penggerak. Mereka minta kami sediakan sabun cair di dekat kantin." (Headmaster, SDN Lowokwaru 05).

''We see children who are usually indifferent now becoming motivators. They ask us to provide liquid soap near the canteen." (Headmaster, SDN Lowokwaru 05).

Post-intervention data showed that 95% of students were observed washing hands before recess, a 60% increase compared to baseline. The availability of soap also improved, as several parent-teacher associations (PTAs) voluntarily purchased soap and refilled dispensers to maintain consistency.

One of the most compelling outcomes was the role of children as change agents in their households. Parents mentioned that their children reminded them to wash their hands or dispose of trash properly.

"Anak saya sekarang cerewet, kalau saya lupa cuci tangan dia bilang 'Bu, harus pakai sabun!' Saya jadi ikut terbiasa." (MR, 35 tahun).

"My child is now very talkative. If I forget to wash my hands, he says, 'Mom, you have to use soap!' I've gotten used to it too." (MR, 35 years old).

"Setelah ikut penyuluhan, anak saya meminta dibuatkan tempat cuci tangan di rumah seperti yang ada di sekolah." (AI, 27 tahun).

"After attending the counseling session, my child asked me to make a hand washing station at home like the one at school." (AI, 27 years old).

These ripple effects indicate that health education delivered in schools not only changes individual student behavior but also influences household practices, extending the impact of the intervention beyond the school compound.

Teachers also observed a tangible impact on health-related absenteeism. Records showed a decline in diarrhea-related absences from an average of seven cases per month prior to the intervention to two cases per month in the following observation period. This reduction was corroborated by school nurses, who noted fewer clinic visits for stomach-related complaints.

Another significant change was the integration of CHLB principles into school routines. Teachers began incorporating handwashing reminders into daily schedules and using CHLB themes in science and civic education lessons. Some schools even displayed posters and student-made artwork promoting healthy habits.

"Sekarang sebelum masuk kelas, kami ajak anak-anak berbaris dan mencuci tangan bersama. Ini jadi kebiasaan baru." (Class Teacher, SDN Lowokwaru 03).

"Now, before entering the classroom, we ask the children to line up and wash their hands together. This has become a new habit." (Class Teacher, SDN Lowokwaru 03).

The combination of visual reinforcement, practical demonstrations, and consistent teacher involvement created an enabling environment where health-promoting behaviors became normative rather than exceptional. Classroom dynamics improved, with teachers noting that healthier children were more attentive and active during lessons.

In summary, school-based education acted as a crucial multiplier for CHLB counseling outcomes. By embedding health practices in a structured learning environment and leveraging peer influence, schools helped transform individual knowledge into community-wide action. The evidence from both observational data and testimonies demonstrates that empowering children as health ambassadors can generate sustained behavioral shifts that extend into family and community life.

Community Participation and Environmental Action (Revised ±500 words)

Beyond individual and household-level changes, the CHLB counseling program stimulated collective action within the community. This was one of the most visible outcomes of the intervention, as neighborhoods began organizing **gotong royong** (communal workdays) more frequently and with higher participation rates. Baseline data indicated that community clean-up events were sporadic and typically attended by fewer than 10 households per neighborhood. Two months after the intervention, participation tripled, with 25–30 households joining on average.

A community leader from RT 05 described the change in atmosphere:

"Dulu kerja bakti harus diumumkan berkali-kali, yang datang sedikit. Sekarang warga justru bertanya kapan jadwal kerja bakti berikutnya." (Head of RT 05).

"In the past, community service activities had to be announced repeatedly, and few people would show up. Now, residents actually ask when the next community service activity will be held." (Head of RT 05).

During observational visits, researchers noted cleaner drainage channels, reduced standing water, and fewer piles of uncollected waste compared to baseline. Several neighborhoods established regular schedules for cleaning public areas, a sign that community-driven systems had begun to take root.

"Sebelumnya banyak genangan air di selokan depan rumah, sekarang sudah bersih. Nyamuk berkurang dan anak-anak bisa main di halaman tanpa takut gigitan." (MR, 35 tahun).

"Previously, there was a lot of standing water in the gutter in front of the house, but now it is clean. There are fewer mosquitoes, and the children can play in the yard without fear of being bitten." (MR, 35 years old).

Participation was no longer limited to men; women and adolescents increasingly took part, reflecting a broader sense of shared responsibility.

"Sekarang ibu-ibu juga turun tangan, bahkan remaja ikut angkat sampah. Jadi suasana kerja bakti lebih ramai." (Community Volunteer, RW 03).

"Now mothers are also getting involved, and even teenagers are picking up trash. So the community service atmosphere is livelier." (Community Volunteer, RW 03).

One of the most innovative developments was the installation of public handwashing stations near prayer houses and community halls. These were initiated by local youth groups using repurposed water containers and soap donated by residents. This initiative was not part of the formal intervention plan, suggesting a degree of community ownership and creativity that extended beyond the facilitated sessions.

In FGDs, participants emphasized that the counseling sessions had raised awareness about the connection between environmental cleanliness and disease prevention, motivating them to take collective action.

"Kami jadi tahu kalau selokan yang tersumbat bisa jadi sarang nyamuk. Setelah dibersihkan bersama-sama, kami lebih tenang." (AI, 27 tahun).

"We learned that clogged drains can become mosquito breeding grounds. After cleaning them together, we feel more at ease." (AI, 27 years old).

Several neighborhoods reported that cases of dengue fever had decreased, although this was anecdotal and not verified by medical records. Nonetheless, participants expressed strong belief that cleaner surroundings contributed to improved community health.

Another noteworthy impact was the informal establishment of waste sorting points. A group of residents collaborated with local waste collectors to separate plastic waste for sale, generating small income streams for the community.

"Sampah plastik sekarang dikumpulkan lalu dijual. Hasilnya dipakai untuk membeli sabun cuci tangan untuk balai warga." (Community Treasurer, RT 07).

"Plastic waste is now collected and sold. The proceeds are used to buy hand soap for the community hall." (Community Treasurer, RT 07).

These actions demonstrate that the CHLB counseling not only triggered individual behavior change but also catalyzed collective efficacy—where community members felt empowered to work together to solve shared problems. The increase in participation, the

emergence of locally initiated solutions, and the integration of health-promoting infrastructure into public spaces suggest that the program has planted the seeds for long-term sustainability.

This study demonstrates that CHLB counseling, when implemented as a participatory and community-centered intervention, effectively improved health knowledge, daily hygiene practices, and community-level engagement in Malang City. The results corroborate the notion that behavioral change requires more than one-way health promotion messages; it must involve interactive, empowering processes that mobilize individual, familial, and communal resources.

Discussion

The concept map above illustrates the interconnection among various aspects of community empowerment through the Clean and Healthy Living Behavior (CHLB) program in Malang City. The central concept is "Community Empowerment through CHLB," which serves as the core of the strategy to improve public health status. From this central concept emerge seven interrelated branches that collectively represent the key components of the approach.

Figure 2. concept map of Community Empowerment through PHBS

Household Practices as the Foundation of Change

The notable improvement in handwashing compliance and latrine usage observed in this study illustrates how structured counseling and targeted communication can effectively translate knowledge into consistent hygienic behavior. This finding reinforces earlier evidence showing that behavior change is most successful when communication is interactive, sustained, and embedded within local realities. For example, participatory hygiene interventions in rural Java led to a 35–45% improvement in hygiene practices (Minarni et al., 2017), while similar results were echoed in rural Bangladesh, where high uptake of handwashing and sanitation behaviors was achieved through regular home visits by trained community health workers promoting both technology and behavior change strategies (Parvez et al., 2018)

Extending this evidence base to an urban setting, our findings affirm that even in densely populated areas where social norms may conflict, behavior change communication (BCC) remains effective. For instance, in Tanzania, a large-scale randomized trial demonstrated that combining handwashing and sanitation campaigns significantly reduced open defecation and increased latrine construction, although handwashing behavior changes were less consistent unless reinforced through direct engagement (Briceño et al., 2015)

A systematic review by Buck and Van Remoortel (2017) further confirms that community-based approaches that include both hygiene and sanitation components are more effective than isolated campaigns, with increased use of latrines and handwashing at key times being the most consistent outcomes. The review also highlights that message repetition, interpersonal delivery, and cultural sensitivity are critical to sustaining behavior change over time (Buck & Van Remoortel, 2017)

Additionally, during the COVID-19 pandemic, households in rural India reported sustained increases in handwashing frequency and quality, indicating that behavior change,

once internalized, can persist beyond the intervention period (Bauza et al., 2021). These results collectively support the BCC framework, which emphasizes that repeated, interactive, and culturally relevant exposure to health messages fosters internalization and habit formation [(WHO, 2021)].

Schools as Catalysts for Intergenerational Health Behavior

The results from school-based interventions underscore the strategic potential of schools in shaping not only student behavior but also broader community health norms. The marked rise in handwashing compliance and reduced absenteeism due to diarrheal diseases mirrors global findings that health education delivered in schools offers a high return on investment, particularly in low-resource settings (Basch, 2011; Brumana et al., 2017).

Beyond individual behavior, this study presents compelling evidence of reverse knowledge transfer, where children effectively influenced household practices. This finding aligns with research from the SWASTHH program in India, which demonstrated that school sanitation and hygiene education significantly improved the hygiene practices of both students and their families, driving generational change in rural communities (Snel & Shordt, 2002).

Similarly, school-based hygiene education in Nigeria significantly improved students' personal hygiene practices, with over 65% of students rated as clean after the intervention, compared to less than 45% at baseline (Ilika & Obionu, 2002). Although the gains slightly declined after three months, the sustained improvement suggests that schools are powerful vehicles for instilling lasting hygiene habits.

Further support comes from a study in Kenya, where implementing hygiene curricula alongside handwashing and drinking water stations in primary schools resulted in improved student hygiene practices and a measurable decline in respiratory illness (Patel et al., 2012). Notably, the benefits extended beyond school, as household visits revealed continued hygiene adherence among students and their families. These findings substantiate UNESCO's (2022) recommendation to embed health promotion into formal education systems as a sustainable strategy for public health. Schools not only cultivate healthier students but also serve as conduits for transforming community norms through children's influence on their households.

Community Participation and Social Capital Building

The sharp increase in gotong royong (mutual cooperation) participation demonstrates how structured health interventions can foster collective efficacy, a key driver of long-term behavioral change (Bandura, 2000). By embedding hygiene as a shared community value, CHLB counseling did more than promote individual compliance—it cultivated a social environment where health became a communal responsibility. This shift aligns with findings from participatory sanitation projects across diverse contexts, where community involvement not only ensured better infrastructure uptake but also improved behavioral sustainability (Nelson et al., 2021).

The present study contributes novel evidence by showing that community ownership can transcend passive compliance, as seen in residents voluntarily initiating public handwashing stations and waste-sorting systems—activities not required by facilitators. This proactive engagement suggests the emergence of health-oriented civic identity and a deeper cultural shift. Similar outcomes have been documented in rural Nepal, where communities co-designed and managed WASH interventions, leading to improved sanitation practices and greater inclusiveness, especially among marginalized groups (Joshi, 2011).

A case study in Burkina Faso further highlights that collective action and local leadership, underpinned by strong social capital, were essential to sustaining the use of ecological sanitation systems. Through group norms, peer accountability, and public visibility of hygiene behaviors, communities reinforced compliance without external enforcement mechanisms (Dickin et al., 2017). Moreover, the Community Health Club (CHC) model implemented across several low- and middle-income countries shows how collective education forums not only improve hygiene knowledge but also build social capital that supports collective action and long-term sustainability (Rosenfeld et al., 2021). This model has demonstrated comparable outcomes to subsidy-heavy interventions, with added benefits of community empowerment and cost-effectiveness.

Taken together, these findings affirm that when hygiene promotion is embedded in participatory frameworks, it creates pathways for civic engagement, trust-building, and culturally resonant public health action.

Health Literacy and Behavior Sustainability

The results underscore the pivotal role of health literacy in determining the sustainability of hygiene behaviors across age groups. While the intervention led to positive changes, older participants encountered difficulties in maintaining new routines, such as consistent handwashing and latrine use. This finding echoes Nutbeam's (2008) model of critical health literacy, which emphasizes that the ability to access, understand, appraise, and apply health information is a progressive process that depends heavily on contextual support.

This observation is strongly supported by research in Hong Kong showing that over 63% of older adults had inadequate health literacy, which significantly limited their ability to adopt and sustain hand hygiene practices. Repeated training was identified as a necessary intervention to maintain behavior change in this group (Or et al., 2020). A broader review also confirms that health literacy is consistently associated with positive health behaviors among older populations, including hygiene, physical activity, and disease prevention practices. The review recommends integrating literacy-sensitive approaches in health interventions, particularly for older adults with chronic conditions (Kirby & Lindly, 2024).

Similarly, a digital health literacy intervention in Pakistan aimed at women of reproductive age showed that while confidence and skills improved, behavioral adherence (e.g., hand hygiene) remained a challenge without sustained reinforcement and tailored messaging (Jafree et al., 2023). These findings suggest that literacy alone is not enough—interventions must also accommodate cognitive aging, literacy levels, and socio-cultural factors that affect message retention and behavior translation. Thus, to avoid behavioral regression, continued reinforcement, age-appropriate materials, and adaptive learning strategies must be embedded into hygiene promotion efforts, especially in multi-generational settings.

Socio-Economic Implications

Participants' testimonies about reduced spending on medical treatment highlight the microeconomic potential of CHLB (Clean and Healthy Living Behavior) programs. Beyond improving health outcomes, structured hygiene promotion appears to free household resources that can be redirected toward education, nutrition, or livelihood needs. These findings are consistent with the economic theory of human capital, which posits that better health leads to higher productivity and reduced economic vulnerability.

Empirical evidence from multiple settings supports this claim. In peri-urban South Africa, households that received participatory hygiene education and hygiene products experienced a significant decline in gastrointestinal and respiratory illnesses, which directly reduced healthcare expenditures (Cole & Hawkley, 2010). A broader review of hygiene interventions across rural and urban areas confirms that improved hygiene practices correlate with better school attendance, enhanced workforce productivity, and reduced income lost due to illness (Hussen & Kamal, 2021).

Additional support comes from research in rural India, where households benefiting from sanitation and hygiene programs saved up to 5% of monthly expenditures due to reduced coping and treatment costs, with the greatest benefits observed among the poorest families (Pattanayak et al., 2010). Even though this study did not conduct a full economic impact analysis, the anecdotal evidence of financial relief reported by participants forms a valuable basis for future cost-effectiveness evaluations. Understanding these economic spillovers is essential for policy advocacy and for positioning CHLB as an investment—not just a public health cost.

Novelty and Contribution

A key strength of this study lies in its multi-layered, integrated approach to promoting Clean and Healthy Living Behavior (CHLB) in an urban setting. Unlike previous studies that often focus on either household education or school-based programs in isolation, this research

demonstrates that sustainable behavior change emerges when interventions operate simultaneously at three interconnected levels: (1) individual and household knowledge and routines, (2) school-based reinforcement and peer learning, and (3) collective community mobilization. This triangulated model contributes to the behavioral change literature by empirically validating a systems-oriented approach that addresses the micro, meso, and macro determinants of health behavior within the same intervention framework.

From a theoretical perspective, the findings enrich the discourse on health promotion and community empowerment in several ways. First, they provide evidence supporting Bandura's concept of collective efficacy, showing that individual intentions are more likely to translate into action when embedded within a supportive social and physical environment. Second, the study operationalizes Nutbeam's (2008) model of health literacy by demonstrating how functional literacy (knowing what to do), interactive literacy (practicing together), and critical literacy (taking collective action) can be sequentially activated through an intervention that moves from counseling to community action. Third, the research aligns with the WHO's Health Promotion Framework by offering a concrete example of how settings-based health promotion—in this case, households, schools, and neighborhoods—can work synergistically rather than in silos.

In terms of practical contributions, this study highlights a replicable model for urban health promotion in developing-country contexts. The intervention required modest resources—simple counseling tools, trained facilitators, and community participation—yet generated measurable improvements in hygiene practices, environmental cleanliness, and even socio-economic outcomes. The observed ripple effects, such as children influencing parental behavior and residents initiating public handwashing stations, underscore the potential for interventions to go beyond compliance and spark bottom-up innovation. These emergent behaviors are particularly valuable because they suggest a degree of local ownership that is crucial for long-term sustainability.

This research also responds to a knowledge gap in urban health literature. Much of the prior work on CHLB or PHBS interventions in Indonesia has concentrated on rural or peri-urban communities where infrastructure and social cohesion differ significantly from urban areas. By focusing on Malang City—a rapidly growing urban center with diverse socio-economic profiles—this study contributes context-specific insights that are applicable to other secondary cities experiencing similar demographic and public health pressures. In doing so, it advances understanding of how health promotion strategies must be adapted for dense, heterogeneous populations where behavior change can be complicated by time constraints, environmental stressors, and competing priorities.

Finally, this study lays the groundwork for future research and policy experimentation. Quantitative follow-up studies could measure the long-term retention of behaviors and assess the cost-effectiveness of multi-level CHLB interventions. Additionally, comparative studies across multiple cities could explore how variations in governance, infrastructure, and cultural norms affect program outcomes. By providing both empirical evidence and a conceptual model, this study positions itself as a stepping stone toward more holistic, city-wide health promotion strategies that are scalable and sustainable.

Policy Implications and Recommendations

The results of this study hold significant implications for public health policy and community development strategies, particularly as Indonesia strives to meet the national CHLB coverage target of 70% by 2025. The evidence generated here indicates that behavior change is most effective when interventions are participatory, context-sensitive, and supported by enabling infrastructure. Consequently, policymakers should consider scaling up CHLB counseling as a structured, community-embedded program rather than relying solely on mass media campaigns or one-time health education events.

First, scaling up participatory CHLB counseling is essential to institutionalize behavior change. The use of trained community health workers (kader posyandu) and local facilitators proved effective in bridging knowledge gaps and creating trust between health promoters and residents. This approach aligns with Indonesia's decentralized health system, where local governments hold authority for community health promotion. Formalizing CHLB counseling

as a routine activity under municipal health offices would ensure continuity, provide consistent funding, and allow systematic monitoring of coverage and outcomes.

Second, embedding CHLB education into school curricula can create a generational shift in health behavior. Schools should not only teach hygiene practices in theory but also integrate them into daily routines—such as requiring handwashing before meals and incorporating CHLB themes into science and civic education lessons. The Ministry of Education, Culture, Research, and Technology could collaborate with the Ministry of Health to develop age-appropriate learning modules, teacher training, and infrastructure support to ensure that schools are equipped with functioning handwashing stations and soap. Such integration would make CHLB part of children's lived experience, producing long-term habit formation that spills over into their families.

Third, improving sanitation and waste management infrastructure is a critical complement to behavior change interventions. Even the most motivated households cannot consistently practice CHLB if they lack access to clean water, safe latrines, or reliable waste disposal services. Local governments should consider providing micro-grants, subsidies, or revolving funds to help low-income households repair or build latrines, install handwashing facilities, and procure waste bins. Public-private partnerships could be leveraged to enhance waste collection efficiency and recycling efforts, turning community waste separation initiatives into sustainable livelihood opportunities.

Finally, encouraging community-led initiatives will help sustain momentum and foster a sense of ownership. Local governments could introduce recognition schemes—such as annual "Healthy Neighborhood Awards"—to incentivize continued participation in gotong royong, maintenance of public spaces, and innovative health-promoting projects. This approach taps into the cultural value of social recognition (penghargaan sosial), which can be a powerful motivator for collective action.

Table 2. Policy Roadmap for Scaling Up CHLB Interventions

Horizon	Key Actions	Stakeholders	Expected Outcomes
Short-Term (0–12 months)	1. Institutionalize participatory CHLB counseling as part of municipal health office programs. 2. Train and deploy community health workers (*kader*) to facilitate regular sessions. 3. Integrate CHLB topics into extracurricular school activities and provide starter kits for handwashing facilities. 4. Launch public campaigns to reinforce counseling messages.	Local Health Offices (Dinkes), School Principals, Community Health Workers, Local Leaders	Increased community awareness and engagement, availability of basic handwashing facilities, improved knowledge about CHLB indicators.
Medium-Term (1–3 years)	1. Embed CHLB education formally into school curricula and teacher training modules 2. Establish a municipal monitoring system to track CHLB compliance. 3. Provide micro-grants or subsidies for household latrine repairs and waste management improvements. 4. Develop partnerships with the private sector for waste recycling and soap supply.	Ministry of Health, Ministry of Education, Local Governments, PTAs, Private Sector	Sustained improvement in household and school CHLB practices, better infrastructure access, reduced prevalence of waterborne diseases.

Long-Term (3–5 years)	1. Scale up CHLB model city-wide and replicate to other urban centers. 2. Institutionalize annual "Healthy Neighborhood Awards" to incentivize community action. 3. Integrate CHLB indicators into local government performance metrics (RPJMD, SDGs). 4. Conduct periodic impact evaluations and cost-benefit analyses for program refinement.	Provincial Government, Bappeda, National Health Authorities, Academic Institutions	City-wide behavioral norm shift, measurable reduction in healthcare expenditures, stronger alignment with SDG targets (SDG 3: Good Health and Well-Being, SDG 6: Clean Water and Sanitation).

Overall, these policy recommendations converge on the idea that CHLB promotion should be framed not as a one-off campaign but as a long-term social investment. By combining behavior change communication, educational integration, infrastructure support, and community incentives, policymakers can accelerate progress toward national health targets while simultaneously strengthening social cohesion and reducing preventable disease burdens.

4. Conclusion

This study provides strong empirical evidence that participatory CHLB counseling can serve as a powerful driver of behavioral and environmental change in urban communities. Using a descriptive qualitative design involving 60 households and two primary schools, the research explored how counseling interventions influenced knowledge, attitudes, and practices related to hygiene, sanitation, and waste management, as well as their broader socio-economic and environmental implications.

The results revealed substantial improvements in community health knowledge, household hygiene practices, school-based health behaviors, and participation in collective environmental action. Handwashing compliance, proper latrine use, and waste separation increased significantly, while reports of diarrhea-related absenteeism and preventable illnesses declined. Children emerged as key change agents, transferring knowledge from school to home, and neighborhoods demonstrated enhanced social cohesion through regular community clean-ups and the creation of shared handwashing stations.

Discussion of these findings highlighted the importance of a multi-level intervention model that simultaneously targets individuals, families, and communities. The study confirmed the relevance of collective efficacy and health literacy theories in shaping sustained behavior change and demonstrated the potential of school-based education to produce intergenerational impact. The novelty of this research lies in documenting an integrated, urban-based approach to CHLB promotion that stimulated bottom-up innovations, such as community-initiated waste sorting and public hygiene infrastructure.

In practical terms, the study recommends scaling up participatory CHLB counseling, embedding CHLB education in school curricula, providing infrastructural support for sanitation and waste management, and incentivizing community-led initiatives. Such policy measures can help accelerate progress toward Indonesia's national CHLB coverage target of 70% by 2025 while also contributing to the broader goals of improving environmental health, reducing healthcare costs, and achieving Sustainable Development Goals (SDG 3 and SDG 6).

Ultimately, this study concludes that community empowerment through CHLB counseling is not merely a health promotion activity but a social investment that strengthens collective responsibility, enhances quality of life, and builds the foundation for sustainable urban health systems. Future research should focus on longitudinal evaluations and cost-benefit analyses to further validate the long-term impact and scalability of this integrated approach across different urban settings.

References

Anggoro, S., Harmianto, S., & Yuwono, P. D. (2018). Upaya Meningkatkan Kemampuan Pedagogik Guru Melalui Pelatihan Pembelajaran Tematik Sains Menggunakan Inquiry Learning

Process dan Science Activity Based Daily Life. *Jurnal Pengabdian Dan Pemberdayaan Masyarakat*, 2(1), 29–35. https://doi.org/10.24198/jppm.v2i1.19221
Bandura, A. (2000). Exercise of human agency through collective efficacy. Current Directions in Psychological Science, 9(3), 75–78.
Basch, C. E. (2011). Healthier Students Are Better Learners: A Missing Link in School Reforms to Close the Achievement Gap. Journal of School Health, 81(10), 593–598.
Bauza, V., Sclar, G., Bisoyi, A., Majorin, F., Ghugey, A., & Clasen, T. (2021). Water, sanitation, and hygiene practices and challenges during the COVID-19 pandemic: a cross-sectional study in rural Odisha, India.
Briceño, B., Coville, A., & Martinez, S. (2015). Promoting handwashing and sanitation: Evidence from a large-scale randomized trial in rural Tanzania.
Brumana, L., Arroyo, A., Schwalbe, N. R., Lehtimaki, S., & Hipgrave, D. B. (2017). Maternal and Child Health Services and An Integrated, Life-cycle Approach to the Prevention of Non-communicable Diseases. *BMJ Global Health*, 2(3), e000295. https://doi.org/10.1136/bmjgh-2017-000295
Brumana, L., et al. (2017). Understanding the role of schools in tackling health inequalities: policy brief. WHO Regional Office for Europe.
Buck, E., & Parvez, S., Azad, R., Rahman, M. M., Unicomb, L., Ram, P., Naser, A. M., et al. (2018). Achieving optimal technology and behavioral uptake of single and combined interventions of water, sanitation hygiene and nutrition, in an efficacy trial (WASH benefits) in rural Bangladesh. Trials, 19.
Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. J. (2014). The use of triangulation in qualitative research. Oncology Nursing Forum, 41(5), 545–547. https://doi.org/10.1188/14.ONF.545-547
Creswell, J. W., & Poth, C. N. (2018). Qualitative inquiry and research design: Choosing among five approaches (4th ed.). SAGE Publications.
Cole, E., & Hawkley, M. (2010). Comprehensive community hygiene promotion in peri-urban Cape Town: gastrointestinal and respiratory disease reduction in families. International Journal of Infectious Diseases, 14.
Dickin, S., Bisung, E., & Savadogo, K. (2017). Sanitation and the commons: The role of collective action in sanitation use. Geoforum, 86, 118–126.
Hussen, M., & Kamal, A. (2021). Analysing the socioeconomic impact of improved hygiene practices in urban and rural settings. International Journal of Medicine Sciences.
Ilika, A., & Obionu, C. (2002). Personal hygiene practice and school-based health education of children in Anambra State, Nigeria. The Nigerian Postgraduate Medical Journal, 9(2), 79–82.
Jafree, S., Muzammil, A., Burhan, S. K., Bukhari, N., & Fischer, F. (2023). Impact of a digital health literacy intervention and risk predictors for multimorbidity among poor women of reproductive years. Digital Health.
Joshi, S. (2011). Community Participation & Ownership of Sanitation and Hygiene in Western Nepal. Diaconia University of Applied Sciences.
Kementerian Kesehatan Republik Indonesia. (2011b). Pedoman pembinaan perilaku hidup bersih dan sehat (PHBS). Jakarta: Kementerian Kesehatan Republik Indonesia.
Kementerian Kesehatan RI. (2020). Profil Kesehatan Indonesia 2020. Jakarta: Kemenkes RI.
Kirby, B. R., & Lindly, O. (2024). A rapid evidence review on health literacy and health behaviors in older populations. Aging and Health Research.
Lincoln, Y. S., & Guba, E. G. (1985). Naturalistic inquiry. SAGE Publications.
Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). Qualitative Data Analysis: A Methods Sourcebook. *Qualitative Research Journal*, 14(4), 381–383. https://doi.org/10.1080/13645579.2014.915117
Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). Qualitative data analysis: A methods sourcebook (3rd ed.). SAGE Publications.
Minarni, E. W., Utami, D. S., & Prihatiningsih, N. (2017). Pemberdayaan Kelompok Wanita Tani Melalui Optimalisasi Pemanfaatan Pekarangan dengan Budidaya Sayuran Organik Berbasis Kearifan Lokal. *Jurnal Pengabdian Dan Pemberdayaan Masyarakat*, 1(2), 147–154. https://doi.org/10.24198/jppm.v1i2.13766

Nelson, S., Drabarek, D., Jenkins, A., Negin, J., & Abimbola, S. (2021). How community participation in water and sanitation interventions impacts human health, WASH infrastructure and service longevity in low-income and middle-income countries: A realist review. BMJ Open, 11.

Nutbeam, D. (2008). The evolving concept of health literacy. Social Science & Medicine, 67(12), 2072–2078.

Or, P., Wong, B., & Chung, J. (2020). To investigate the association between health literacy and hand hygiene practices of older adults. American Journal of Infection Control, 48(5), 485–489.

Patel, M., Harris, J., Juliao, P., et al. (2012). Impact of a hygiene curriculum and the installation of simple handwashing and drinking water stations in rural Kenyan primary schools on student health and hygiene practices. The American Journal of Tropical Medicine and Hygiene, 87(4), 594–601.

Pattanayak, S. K., Poulos, C., Yang, J. C., & Patil, S. R. (2010). How valuable are environmental health interventions? Evaluation of water and sanitation programmes in India. Bulletin of the World Health Organization, 88(7), 535–542.

Patton, M. Q. (2015). Qualitative research and evaluation methods (4th ed.). SAGE Publications.

Prasanti, D., & Fuady, I. (2017). Penyuluhan Program Literasi Informasi Kesehatan Dalam Meningkatkan Kualitas Sanitasi Bagi Masyarakat. *Jurnal Pengabdian Dan Pemberdayaan Masyarakat*, 1(2), 129–138. https://doi.org/10.24198/jppm.v1i2.13867

Rosenfeld, J., Berggren, R., & Frerichs, L. (2021). A review of the Community Health Club literature describing water, sanitation, and hygiene outcomes. International Journal of Environmental Research and Public Health, 18.

Raksanagara, A. S., & Raksanagara, A. (2015). Perilaku Hidup Bersih dan Sehat Sebagai Determinan Kesehatan yang Penting pada Tatanan Rumah Tangga di Kota Bandung. *Jurnal Sistem Kesehatan*, 1(1), 30–34. https://doi.org/10.24198/jsk.v1i1.10334

Snel, M., & Shordt, K. (2002). School Water and Sanitation Towards Health and Hygiene in India. IRC International Water and Sanitation Centre & UNICEF.

Sutanto, D. H., Sugeha, A. Z., Elfaranica, I., & Wijaya, D. B. (2023). Analisis Potensi Kota Malang sebagai Tempat Transit Wisata. Jurnal Pariwisata Budaya, 8(2), 45–57. https://doi.org/10.25078/pariwisata.v8i2.3035

Umar, Z. (2008). Perilaku Cuci Tangan Sebelum Makan dan Kecacingan Pada Murid SD di Kabupaten Pesisir Selatan Sumatera Barat. *Jurnal Kesehatan Masyarakat Nasional*, 2(6), 249–254. https://doi.org/10.22435/jk.v2i6.249

UNESCO. (2022). Futures of Education: Health and Well-being in Schools. United Nations Educational, Scientific and Cultural Organization.

Van Remoortel, H. (2017). Approaches to promote handwashing and sanitation behaviour change in low- and middle-income countries: a mixed method systematic review. Campbell Systematic Reviews.

WHO. (2021). Behavior Change Communication Strategy for Promoting Hand Hygiene and Sanitation. World Health Organization.