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Addressing Disparities in Clean and Healthy Living Behaviours through Targeted Health Education in a Rural Community

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ABSTRACT
Background: This study addresses the public health issue of community hygiene and wellness by focusing on the Clean and Healthy Lifestyle Behaviours (CHLB) as a key parameter. The assessment focuses on the community of Sompok Hamlet, Bantul, to evaluate the implementation of CHLB within households and identify areas of strength and areas for improvement.
Purpose of the Study: The purpose is to assess the level of CHLB implementation in Sompok Hamlet. The objective is to measure

Keywords
PHBS, Perilaku Hidup Bersih dan Sehat, Community Health, Disease Prevention, Health Promotion

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household compliance across various CHLB indicators and identify specific behavioural gaps that require targeted intervention.
Methods: The study employed a cross-sectional survey design conducted in 2023. Data were collected from 202 households across seven neighbourhood units (*rukun tetangga/RT) using a structured questionnaire to evaluate compliance with* CHLB indicators.
Results: 68.3% of households met the criteria for independent, healthy communities. High compliance was observed in indicators like access to clean water, sanitation, exclusive breastfeeding, and toddler weighing. However, significant gaps were identified in physical activity (71.3% low compliance) and indoor smoking practices (64% low compliance). Practices related to fruit/vegetable consumption, handwashing, and larva elimination showed varied results. The findings highlight the need for focused educational programs to address these specific behavioural deficiencies to promote sustainable community health.

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Introduction

Health is an important aspect of human well-being and a crucial factor in societal development. The Indonesian government recognises the importance of preventive measures to improve public health, which is reflected in the promotion of Clean and Healthy Lifestyle Behaviours (CHLB). According to Kementerian Kesehatan Republik Indonesia (2016), CHLB refers to all health behaviours carried out as a result of personal awareness, enabling families and all their members to take care of their own health and actively participate in community activities. The primary goal of CHLB is to enhance public health by fostering a culture of cleanliness and wellness within households and communities, thereby reducing the incidence of diseases and improving overall quality of life.

CHLB comprises five key domains: household, educational institutions, workplaces, health facilities, and public places. Each domain has specific indicators tailored to address the health challenges unique to that setting. This research focuses on household CHLB implementation. There are 10 indicators specific to household CHLB: (1) childbirth assisted by health professionals, (2) exclusive breastfeeding, (3) regular weighing of infants and toddlers, (4) hand washing with soap and clean water, (5) using clean water, (6) using sanitary toilets, (7) eliminating mosquito breeding sites, (8) consuming fruits and vegetables, (9) engaging in daily physical activity, and (10) avoiding smoking inside the house (Kementerian Kesehatan Republik Indonesia, 2016).

Despite extensive campaigns to promote CHLB, critical challenges remain. Reports have shown disparities in CHLB adoption between rural and urban populations, and in total, the proportion of individuals practising good CHLB nationwide has not yet reached half, standing at 41.3%. By province, the highest proportion of individuals with good CHLB is in Bali (59.2%), followed by DKI Jakarta (55.2%), DI Yogyakarta (51.9%), North Sulawesi (48.1%), and Riau Islands (47.5%). The five provinces with the lowest proportions are Papua (21.7%), East Nusa Tenggara (24.4%), West Sumatra (26.1%), West Kalimantan (26.3%), and Aceh (26.9%) (Kementerian Kesehatan Republik Indonesia, 2021). Factors such as limited access to clean water, lack of education, and cultural norms often hinder the effective implementation of CHLB in

underserved communities. Moreover, the COVID-19 pandemic has underscored the critical role of CHLB, particularly in practising hand hygiene and maintaining environmental cleanliness, to control the spread of infectious diseases.

Sompok Hamlet, located in Sriharjo Village, Imogiri, Bantul, faces unique vulnerabilities. Situated on the dry, rugged slopes of the Sewu Highlands in the southern part of Yogyakarta, the hamlet's geography limits access to water and cultivable land. Most residents live on dry hillside terrain, and during the dry season, water must be sourced from the distant Oyo River below the hamlet. Moreover, the region is prone to natural disasters such as landslides and flooding, has limited access to healthcare, a large elderly population, and geographical challenges. The population also faces economic hardship, with a high percentage classified as poor or very poor. These factors increase the risk of infectious disease outbreaks, such as dengue fever, diarrhoea, and tuberculosis, as well as non-communicable diseases (Fitrianatsany, 2016). These conditions make CHLB particularly relevant as a strategic focus. This research aims to assess the current level of clean and healthy behaviours among the community and identify the necessary interventions to improve them. By addressing these issues, the research strives to contribute to the development of evidence-based solutions that promote sustainable health practices and enhance the overall quality of life in the region.

Method

To fulfil the objective of identifying the main health problems within the community, the research began with a preliminary engagement phase involving focus group discussions with key stakeholders in Sompok Hamlet and Imogiri II Community Health Centre. This initial consultation aimed to understand local health challenges from the community's perspective and guide the planning of relevant activities. The focus group discussion in Sompok Hamlet involved four stakeholders (one village chief and three health cadres), while the focus group discussion in Imogiri II Community Health Centre involved three stakeholders (one health centre chief and two nutritionists). These focus group discussions revealed that Sompok Hamlet was the least compliant hamlet among 13 hamlets in Sriharjo Village in implementing CHLB, as evidenced by residents' habit of littering the river and the high prevalence of adolescent smoking and alcohol consumption. That finding justified selecting CHLB as the key area to assess and address.

Following the preliminary engagement phase, the team conducted an observational, cross-sectional study to capture CHLB practices among Sompok Hamlet's residents. Data collection was conducted using a combination of questionnaires, interviews, and direct observation by a team of enumerators comprising health care workers and medical students. The survey covered all households in Sompok Hamlet. For the CHLB assessment, interviews were conducted using a standardised CHLB household form (Table 1). Direct observations focused on two key environmental indicators: use of clean water and presence of mosquito larvae around homes.

Table 1. Standard CHLB Indicators (Departemen Kesehatan Republik Indonesia, 2008)

No	Indicator	Score
1	Childbirth Assisted by Health Professionals	(0) = Childbirth is not assisted by a midwife, doctor, or health professional/If the mother dies during childbirth/Lack of knowledge about the importance of assistance from health professionals.
		(1) = Childbirth is assisted by a midwife, doctor, or health professional/The mother and baby are safe/ There is positive knowledge about the importance of assistance from health professionals.

2	Providing Exclusive Breastfeeding	(0) = Babies aged 0-6 months are given formula milk or additional foods, including cow's milk/Parents lack knowledge about the importance of exclusive breastfeeding.
		(1) = Babies aged 0-6 months are exclusively breastfed without any additional foods, including formula milk/Positive knowledge about the importance of exclusive breastfeeding.
3	Weighing Toddlers Regularly	(0) = Toddlers have weighed less than 4 times in the last 6 months/Parents lack knowledge about the importance of regular weighing.
		(1) = Toddlers are weighed at least 4 times in the last 6 months/Positive knowledge about the importance of regular weighing.
4	Using Clean Water	(0) = Family members do not use clean water (e.g., water from PDAM or treated sources).
		(1) = Family members use clean water for drinking, cooking, bathing, and cleaning (from PDAM, wells, or treated water sources).
		(1+) = Inspect clean water facilities at home (e.g., wells, PDAM).
5	Handwashing with Soap and Clean Water	(0) = Household members do not wash their hands with soap and clean water after defecating, before eating, or before cooking.
		(1) = Household members wash their hands with soap and clean water after defecating, before eating, and before cooking.
		(1+) = Check whether handwashing facilities are available.
6	Using Sanitary Toilets	(0) = Household members defecate in open spaces, such as rivers or gardens, and do not use a toilet.
		(1) = Household members use sanitary toilets and do not defecate in open spaces
		(1+) = Check whether sanitation facilities meet health standards, including features such as a goose neck trap, septic tank, or Wastewater Treatment System (SPAL), either for individual or shared use
7	Eliminating Mosquito Breeding Sites at Home	(0) = Household members do not clean mosquito breeding sites, such as stagnant water or trash, and do not eliminate larvae.
		(1) = Household members regularly clean mosquito breeding sites and eliminate mosquito larvae.
		(1+) = No mosquito larvae were found during observation
8	Consuming Vegetables and Fruits Daily	(0) = The family does not consume vegetables and fruits daily or in sufficient quantities to meet nutritional needs.
		(1) = The family consumes vegetables and fruits daily in adequate amounts to meet their nutritional needs.
		(1+) = Consuming food, including vegetables and fruits, daily according to "My Plate/*Isi piringku*" (highlighting balanced nutrition)
9	Engaging in Daily Physical Activity	(0) = Household members do not engage in physical activity for at least 30 minutes daily (neither exercise nor physical labor).
		(1) = Household members engage in at least 30 minutes of daily physical activity, either through exercise or work-related activities.
10	Not Smoking Inside the House	(0) = Household members still smoke inside the house.
		(1) = Household members do not smoke inside the house, ensuring a smoke-free home.

The data were analysed descriptively to provide an overview of households' current CHLB practices in the community. First, households were classified into four categories based on their compliance with CHLB practices: basic, intermediate, advanced, and self-reliant (Table 2). Second, each behaviour was analysed in detail to determine the extent of household behaviour practice, represented by scores 0 and 1, with some CHLB indicators also marked with an additional score of +1 in the scale. The CHLB indicators were then ranked by the number of households practising the best practices; indicators with the highest number of +1 scores or the accumulation of +1 and 1 scores were prioritised in the rankings. Finally, the three least adhered-to behaviours were identified as the main health problems within the community. The study workflow is shown in *Figure 1*.

Table 2. Household Classification According to Clean and Healthy Lifestyle Behaviours (CHLB) Indicators (Departemen Kesehatan Republik Indonesia, 2008)

Household Classification	Household Category	Criteria
I	Basic	Household implements up to 3 CHLB indicators
II	Intermediate	Household implements 4 to 5 CHLB indicators
III	Advanced	Household implements 6 to 7 CHLB indicators
IV	Self-Reliant	Household implements 8 to 10 CHLB indicators

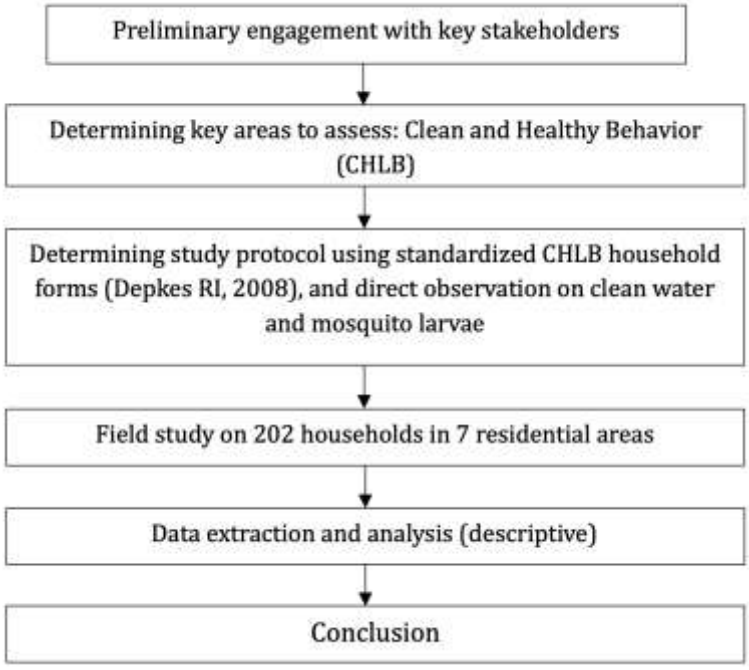

Figure 1. Study Workflow on CHLB Assessment

Result

The CHLB survey was conducted on September 17, 2023. The survey covered 7 neighbourhood units (*rukun tetangga*/RT) and included 202 households as respondents. Based on the CHLB indicator survey, the majority of residents in Sompok Hamlet have met the CHLB criteria, as evidenced by 68.3% of respondents falling into the self-reliant health households category. Additionally, 27.7% fall into the advanced health households category, while the remaining 4% are still classified as intermediate health households *(Figure 2)*.

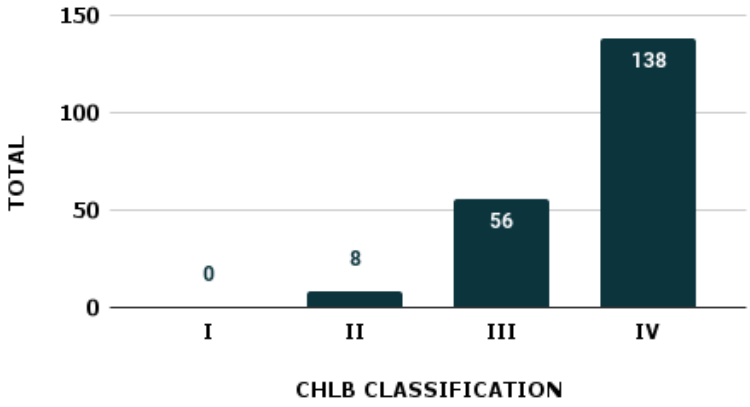

Figure 2. Household Classification According to Clean and Healthy Lifestyle Behaviours (CHLB) Survey

The top three behaviours most practised by households were using clean water, using sanitary toilets, and eliminating mosquito breeding sites at home, while the bottom three behaviours were consuming vegetables and fruits daily, childbirth assisted by health professionals, and weighing toddlers regularly, equally; not smoking inside the house; and engaging in daily physical activity (Table 3).

Table 3. Ranking of CHLB Indicators from Best to Worst in Sompok Hamlet

Rank	**Indicator**	**Number of Households Fulfilling the Criteria Score (%)**		
		+1	**1**	**0**
1	Using clean water	141 (69.8%)	60 (29.7%)	1(0.5%)
2	Using sanitary toilets	141 (69.8%)	58 (28.7%)	3 (1.5%)
3	Eliminating mosquito breeding sites at home	131 (64.8%)	65 (32.2%)	6 (3%)
4	Handwashing with soap and clean water	67 (33.2%)	118 (58.4%)	17 (8.4%)
5	Providing exclusive breastfeeding*)	-	176 (87.1%)	26 (12.9%)
6	Consuming vegetables and fruits daily*)	5 (2.5%)	164 (81.2%)	33 (16.3%)
	Childbirth assisted by health professionals*)	-	169 (83.7%)	33 (16.3%)
	Weighing toddlers regularly	-	169 (83.7%)	33 (16.3%)
7	Not smoking inside the house*)	-	72 (35.6%)	130 (64.4%)

8	Engaging in daily physical activity*)	-	58 (28.7%)	144 (71.3%)

*) Indicators without the score +1 in their scoring scale.

Based on the analysis above, the main health problems identified in Sompok Hamlet were daily vegetable and fruit consumption, health professional-assisted childbirth, regular toddler weighing, indoor smoking, and daily physical activity. However, the indicators of daily consumption of vegetables and fruits, health professional assisted childbirth, and regular toddler weighing were predominantly scored as 1 or +1, indicating that most households had adequate intake of vegetables and fruits, delivery assisted by a health professional, and regular toddler weighing according to standards. This reduced the urgency of prioritising these issues for intervention.

In contrast, the indicators for indoor smoking and physical activity showed substantial non-compliance: 64.4% and 71.3% of households scored 0 on these indicators, respectively. This means that the majority of households had members who did not engage in the recommended level of physical activity and who smoked indoors. These findings highlighted the urgency of developing interventions to improve physical activity and reduce indoor smoking habits, as these were the two least adhered-to behaviours.

Discussion

The CHLB survey conducted in Sompok Hamlet on September 17, 2023, provides valuable insight into the community's adherence to clean and healthy living behaviour indicators. Covering 202 households across seven neighbourhood units, the survey reveals a predominantly positive trend in clean and healthy living practices. The overall results showed that 68.3% of households are categorised as self-reliant. This shows a strong level of independence in adopting clean and healthy practices and exceeds the national and Yogyakarta's overall percentage of good CHLB with 41.3% and 51.9%, respectively (Kementerian Kesehatan Republik Indonesia, 2021). It also fulfilled the mandatory authority for minimum service standards (*Kewenangan Wajib dan Standar Pelayanan Minimal*/KW or *Standar Pelayanan Minimal*/SPM) in the health sector, which stipulates that the achievement of healthy households by 2010 should reach 65% according to the Decree of the Minister of Health of the Republic of Indonesia No. 1457/Menkes/SK/X/2003.

The Sompok Hamlet community's adherence to CHLB practices reflects the community's latent capacity for health behaviour change. The high rate of clean water usage, sanitation practices, and compliance with maternal-child health behaviours (e.g., skilled birth attendance, exclusive breastfeeding, and child weighing) suggests that community members recognise the benefits of these behaviours and feel empowered to act on them. As postulated by the Health Belief Model (HBM), perceived benefits that outweigh perceived barriers to enact behaviours, alongside good self-efficacy on performing the behaviour, make individuals more likely to engage in preventive health behaviours (Rosenstock et al., 1988). This might also indicate effective prior health education on cultural norms that reinforce preventive care, both of which are consistent with social cognitive theory, particularly the role of observational learning and social reinforcement (Bandura, 1999).

The Sompok Hamlet community's awareness of clean water and sanitation also enables them to tackle the physical opportunity barriers, defined as 'opportunity afforded by the environment' (Michie et al., 2014), which impede them from implementing three CHLB indicators: using clean water, using proper sanitation facilities, and washing hands with clean water and soap. Geographically, Sompok Hamlet is located within Sriharjo Village, which is bordered by the

confluence of two major rivers in the area: the Opak River, which rises from Mount Merapi, and the Oyo River, which rises from the Gunungkidul region.

The region's proximity to rivers makes it extremely susceptible to floods (Saptutyningsih & Nursetiawan, 2024), thus increasing the barriers to access to clean water and sanitation. However, despite the region's geographical conditions, this survey found that the development of proper water sources and clean sanitary facilities is evident among almost 70% of households who scored 1+ on the survey. This suggests a level of environmental resilience and adaptive behaviour, potentially reinforced by community initiatives or disaster risk reduction efforts.

Despite the successes, challenges persist, particularly in two key areas: smoking indoors and low physical activity. These findings reflect broader national and global trends and point to areas where behavioural health interventions are urgently needed.

Indoor Smoking and Public Health Risk

The survey found that 64% of households engage in indoor smoking, a very concerning result given the extensive evidence on the dangers of secondhand smoke (SHS). The detrimental effects of SHS have been extensively documented in various studies. A study in Chile revealed that the total indoor smoking ban significantly reduced death rates from three major diseases in individuals over 20 years old and lowered hospitalisation rates for ischemic heart disease, with an 8.7% decrease in the 20 44 age group and a 4% decrease in those aged 65 and older. Acute myocardial infarction hospitalisations dropped by 11.5% in the 20 44 age group, while stroke cases decreased by 1.2% across the population (Montes de Oca et al., 2024). Moreover, SHS is also associated with increased rates of asthma, respiratory infections, and sudden infant death syndrome (SIDS) in children (Centers for Disease Control and Prevention, 2024). The American Lung Association in 2019 highlights that young children are especially affected because their developing bodies are more susceptible to the harmful effects of tobacco smoke (American Lung Association, 2019).

The persistence of indoor smoking behaviour among the Sompok Hamlet community may be enforced by cultural norms and social acceptance, where smoking is not yet stigmatized within domestic spaces. A previous study in Indonesia found that although smoking behaviour is resented by wives within households, it is still tolerated to some extent, as smoking has been viewed as the norm (Ayuningtyas et al., 2021). This phenomenon is supported by the Theory of Planned Behaviour (TPB), which postulates that perceived norms influence behaviour alongside attitudes and perceived control by mediating intention (Ajzen, 1991).

Physical Inactivity and Non-Communicable Disease Risk (NCD)

A lack of regular physical activity among residents is another area of concern, where 71.3% of households failed to meet basic physical activity criteria. This is alarming given that physical inactivity is a leading risk factor for non-communicable diseases (NCDs) such as obesity, diabetes, and cardiovascular diseases. This indicator requires immediate attention to promote healthier lifestyles and prevent long-term health complications. The WHO has highlighted that physical inactivity is responsible for 6% of ischemic heart disease cases, 7% of type 2 diabetes, and 10% of breast and colorectal cancers (World Health Organization, 2025). According to a study, insufficient physical activity contributes to approximately 500 million new cases of preventable NCDs globally between 2020 and 2030, resulting in healthcare costs estimated at $520 billion if current trends continue (Białkowski et al., 2024). However, this sedentary lifestyle within the Indonesia context is known not merely due to personal habits, but also to limited availability of safe, accessible spaces for exercise, low community-level promotion of physical movement, or a lack of organised activities (Hanifah et al., 2023).

Community Strengths and Areas for Strategic Intervention

The high CHLB compliance across most domains reflects a strong foundation in health literacy and self-efficacy among the Sompok Hamlet community, potentially influenced by prior public health engagement or local health programs. However, it should also be recognised that this might not apply to all households, as evidenced by households under the advanced and intermediate classifications. Therefore, future strategic interventions should be designed to target common barriers and consider household characteristics to enable the target CHLB.

To reduce indoor smoking and increase the physical activity of household members within the Sompok Hamlet community, the intervention design process could follow the Behaviour Change Wheel (BCW) approach (Michie et al., 2014). Each behaviour should first be specified in terms of who needs to perform the behaviour, what the person needs to do, and when, where, how often, and with whom they will do it. Specification of the actors involved in the behaviours will be necessary, as different populations may face different barriers, requiring different interventions. As suggested by the Transtheoretical Model of Behaviour Change (TTM) (Prochaska & Velicer, 1997), people within the motivational phase (i.e. precontemplation, contemplation, and preparation stages) will benefit from change processes such as consciousness raising, dramatic relief, environmental reevaluation, self-reevaluation, and self-liberation, while people within the volitional phase (i.e. action and maintenance stages) will benefit more from contingency management, helping relationships, counterconditioning, and stimulus control. Following the specification of target behaviour, analyses of what needs to change ('behavioural diagnosis') should then be conducted to identify the barriers to performing the behaviours—whether it is physical capability, psychological capability, physical opportunity, social opportunity, reflective motivation, or automatic motivation—, and further select which are prioritised to target. Subsequently, intervention types, policy options, intervention content, and intervention implementation strategy can be selected accordingly.

Identification of the barriers to reducing indoor smoking and increasing physical activity plays an important role in the intervention development process, as interventions will only be successful in changing behaviours if they specifically address the existing barriers. Within the context of the Sompok Hamlet community, consideration of the population's health literacy and self-efficacy is crucial for the development of interventions. For indoor smoking reduction initiatives, households with low health literacy might benefit from interventions targeting psychological capability, such as a smoking cessation campaign and peer education, while households with good literacy but poor self-efficacy might benefit from household-level counselling. These initiatives can also target adolescents, as early education tends to be more effective in influencing behaviour. Highlighting the health risks of indoor smoking, especially for children and other vulnerable family members, is crucial to improve health literacy and the likelihood of behaviour change. Similarly, for initiatives to increase physical activity, households with low health literacy might benefit from education interventions, such as physical activity campaigns. Yet, if the influence of physical inactivity among the Sompok Hamlet community includes a lack of physical and social opportunities, interventions such as regular community sporting events and the development of safe public spaces will be suitable for supporting behaviour change. All interventions need to be culturally sensitive to ensure cultural relevance and acceptance, thereby promoting behaviour change success.

In addition to interventions for indoor smoking reduction and physical activity improvement, the Sompok Hamlet community can benefit from regular reinforcement of other CHLB, such as proper hygiene practices reinforcement to prevent disease outbreaks. Additionally, although mosquito larvae were not found in most households, continued vector control efforts remain essential due to the area's vulnerability to water stagnation and vector-borne diseases, especially in the context of climate variability and flood-prone geography.

Conclusion

The CHLB surveys conducted in Sompok Hamlet show strong adherence to clean water use, sanitation, and maternal and child health practices. However, indoor smoking and low physical activity remain key challenges to a good CHLB. Targeted health education, community engagement, and local programs, such as smoke-free campaigns and promotion of group exercise, are essential to address these gaps and support sustainable health improvements.

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Conflict of Interest

The authors declare no conflict of interest.

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