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Improving Community Competence in Environmental Health Management: A Health Education Literacy Review

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ABSTRAK

Inadequate community competence in managing environmental health remains a pressing issue across many regions, including Indonesia. This challenge underscores the critical need for comprehensive insights into how health education can play a pivotal role in empowering communities. This research delves into an in-depth systematic literature review, aiming to dissect and assess diverse strategies employed in health education programs to boost the efficiency of environmental health management initiatives. Utilizing the Systematic Literature Review (SLR) approach, this study adheres to the framework provided by PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). The process encompasses key phases: defining precise research inquiries, determining rigorous inclusion and exclusion parameters, and executing an extensive literature search through prominent academic databases such as Google Scholar, PubMed, and Scopus. The search leveraged specific keywords, including "Community Health Education," "Competency in Environmental Health Management," and "Impactful Health Education Programs." From an initial pool of 239 publications, only 25 articles satisfied the stringent screening criteria. The consolidated findings reveal that health education models that are systematically designed, foster active community involvement, and are tailored to local needs significantly enhance public awareness, shape positive attitudes, and develop practical skills for environmental health management. These insights offer actionable strategies to refine and strengthen health education programs across diverse settings.

Keywords: *health education, community competence, environmental health management, PRISMA, systematic literature review.*

INTRODUCTION

The management of environmental health stands as a pivotal global challenge, especially in developing nations grappling with inadequate sanitation infrastructure and limited access to clean water. According to the World Health Organization (WHO, 2024), poor sanitation conditions were linked to an alarming 1.4 million deaths annually in 2024, driven by unsafe drinking water, insufficient hygiene practices, and substandard sanitation systems. These fatalities predominantly occur in low- and middle-income countries, where the consequences of environmental neglect are most severe. Notably, unsafe sanitation alone is responsible for 564,000 deaths, largely due to diarrheal diseases, while also serving as a key driver for the spread of neglected tropical

diseases such as intestinal worm infections, schistosomiasis, and trachoma. Additionally, poor sanitation is a hidden contributor to widespread malnutrition, worsening health vulnerabilities in affected populations.

In parallel, UNICEF (2022) reports that nearly 2.2 billion people worldwide still live without reliable access to safely managed drinking water, a deficiency that fuels the transmission of waterborne and environmentally-driven diseases. The relentless advance of industrialization and unchecked urban growth has intensified the contamination of air, water, and soil, amplifying health risks associated with both infectious diseases (like acute respiratory infections) and chronic conditions such as cardiovascular diseases and developmental impairments in children. The widespread lack of environmental health literacy and the community's limited capacity to mitigate these risks do not only result in elevated disease burdens but also place an overwhelming strain on public health systems, both economically and socially, deepening the crisis at local and global levels.

In Indonesia, the struggle with environmental health challenges continues to pose a significant threat to public well-being, with ripple effects that extend across communities. Diseases rooted in environmental factors, such as acute respiratory infections (ARI) and diarrheal illnesses, persist as leading causes of sickness and death, particularly in regions where access to adequate sanitation and clean water remains scarce. The 2023 Performance Report from the Directorate of Environmental Health underscores the pivotal role of environmental health in shaping the overall health landscape of the Indonesian population, emphasizing its status as a core public service that the government is obligated to uphold (Ministry of Health of the Republic of Indonesia, 2023).

While initiatives aimed at enhancing environmental conditions—such as expanding clean water infrastructure, improving domestic waste management, and implementing air pollution controls—are critical in mitigating the prevalence of environment-related diseases, these efforts often fall short due to a persistent gap in community competence. A widespread lack of knowledge, coupled with low public awareness regarding the importance of sanitation, waste disposal practices, and the adoption of a clean and healthy lifestyle (PHBS), continues to fuel the high rates of environmentally driven health issues (Razak et al., 2024). This disconnect between policy interventions and community engagement remains a formidable barrier to achieving sustainable improvements in public health outcomes.

From a theoretical perspective, environmental health management competence refers to the integration of knowledge, attitudes, and practical skills required to recognize, evaluate, and effectively respond to health challenges stemming from environmental factors. The framework of environmental health theory identifies four dominant determinants of health: individual behavior, genetic predisposition, access to healthcare services, and environmental conditions. Strengthening community capabilities in managing these factors is essential for fostering optimal public health standards (Omid et al., 2021).

Extensive research has underscored the transformative role of health education in enhancing community competencies. For instance, Habena and Mulyani (2019) highlighted that structured education and targeted training programs significantly boost workforce proficiency in Indonesia, particularly within the realm of environmental sanitation management. In another study, Sikome et al. (2016) demonstrated how grassroots community involvement in environmental health initiatives in Kisihang Village, Indonesia, led to tangible improvements in local health outcomes. Moreover, Agusti and Wibawani (2023) reinforced the idea that active civic engagement in environmental stewardship is pivotal in cultivating both environmental awareness and sustainable, eco-friendly practices at the community level.

The limited capability of communities to effectively manage environmental health remains a persistent issue across numerous regions, including Indonesia. This situation underscores the critical need to explore the strategic role of health education in empowering communities and enhancing their resilience. This research is dedicated to conducting an in-depth analysis of existing literature, aiming to assess diverse health education methodologies and determine their impact on improving the efficacy of environmental health management programs.

METODOLOGI

This research adopts the Systematic Literature Review (SLR) methodology, structured according to the principles of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The study begins with the formulation of focused and well-defined research questions that investigate the role of health education in strengthening community competence in managing environmental health. To ensure the relevance and quality of the literature reviewed, strict inclusion and exclusion criteria are established, serving as a filter to identify studies that align with the research objectives. A comprehensive and systematic search is then conducted across reputable academic databases such as Google Scholar, PubMed, and Scopus, utilizing specific keywords including "Community Health Education," "Environmental Health Management Competence," "Community Capacity Building in Environmental Health," and "Effective Health Education Programs." The search results undergo a meticulous screening process, guided by the PRISMA flowchart, which involves several stages: identifying potential studies, screening for duplicates and irrelevant content, and determining the eligibility of each article based on predefined criteria.

Following this, relevant articles are subjected to a rigorous process of coding and data extraction to capture key findings and insights. The final phase involves synthesizing the data from selected studies, integrating diverse perspectives to generate comprehensive conclusions. These synthesized findings are then used to formulate strategic recommendations that aim to enhance the design, implementation, and effectiveness of health education programs, contributing to improved community competence in environmental health.

management (Zawacki et al., 2020). This study employed a Systematic Literature Review (SLR) approach, following the PRISMA guidelines, to assess the impact of health education on enhancing community proficiency in managing environmental health. After reviewing 239 academic journals and conference proceedings, only 25 articles fulfilled the stringent inclusion and exclusion criteria post-screening. Additionally, the research provides a detailed PRISMA flow chart, visually representing the entire process of literature selection and review, step by step.

Table 1. Kriteria Inklusi untuk Peninjauan Literatur

| Category | Inclusion Criteria |
|-------------------------------|---|
| Publication type | Scientific articles published in https://scholar.google.com |
| Journal specifications | Top international journals and national journals for the last 6 years |
| Journal index | Google Scholar, SINTA 1-6, Scopus Q1-NonQ, GARUDA, Crossref, and ICI |
| Publication Year | 2018-2024 |
| Research country | Indonesian and Foreign |
| Variable | The impact of health education initiatives on boosting community proficiency, along with the key elements that determine their success or present obstacles during execution. |
| Field | Medical, Public Health, Social Science, and General |
| Type of study | Theoretical and empirical |
| Keywords | <i>Edukasi Kesehatan Masyarakat, Kompetensi Pengelolaan Kesehatan Lingkungan, Peningkatan Kapasitas Masyarakat, dan Program Edukasi Kesehatan yang Efektif</i> (dalam Bahasa Indonesia dan Inggris) |
| Subject | Research examining diverse community groups and health professionals involved in health education efforts, particularly those aimed at enhancing skills in environmental health management. |

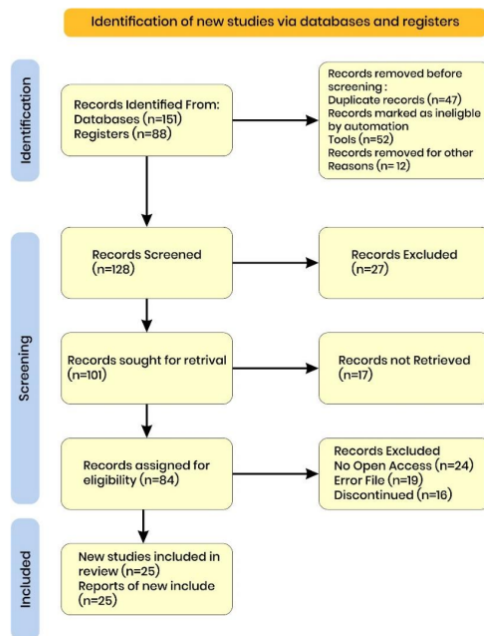


Fig 1. PRISMA Flow Diagram

RESULT

Through a comprehensive literature review utilizing the ¹⁰ Systematic Literature Review (SLR) method guided by the PRISMA framework, a total of 239 articles were retrieved from multiple sources such as Google Scholar, Scopus, SINTA, GARUDA, Crossref, and ICI. Following a stringent selection process based on specific inclusion and exclusion criteria, only 25 articles met the requirements for in-depth examination.

The articles chosen represented a diverse range of studies conducted across several countries, including Indonesia, published between 2018 and 2024. These studies focused on various health education programs aimed at strengthening community skills in environmental health management.

The analysis reveals the following findings:

- 1 Well-organized and continuous educational programs prove to be significantly more effective in enhancing community knowledge and capabilities in environmental health management.
- 2 The success of these programs is influenced by several crucial factors, including: the quality of educational materials, the participatory nature of the program, government backing, and the active involvement of health professionals.

- 3 Innovative educational techniques, such as leveraging digital platforms and adopting community-centered approaches, have notably boosted community engagement and deepened understanding.
- 4 Key obstacles to successful program implementation include resource constraints, low individual motivation, and cultural hurdles present in certain communities.

A PRISMA flowchart has been included to provide a clear visual representation of the literature selection process, outlining the stages of study identification, screening, eligibility assessment, and final inclusion.

DISCUSSION

The literature review highlights several critical insights into the role of health education in enhancing community proficiency in environmental health management. These insights encompass the importance of well-organized and long-term educational initiatives, the key success factors, innovative educational strategies, and the implementation challenges encountered. The subsequent discussion delves deeper into each of these key findings.

1. Impact of Well-Organized and Long-Term Education Initiatives

This study reveals that health education programs that are carefully planned and sustained over time produce a more profound effect on enhancing community capabilities in managing environmental health. Such programs ensure ongoing learning, fostering deeper and more lasting changes in both attitudes and behaviors among participants.

As highlighted by Puspitawati et al. (2021), an effective health education program requires multiple phases of organized interventions, including socialization, training, and continuous reinforcement within the community. Their research underscores the importance of regular assessments, which enable the adaptation of teaching materials to meet the evolving needs and challenges faced by the community at different stages of the program. They also discovered that communities engaged in well-structured health education initiatives generally have a stronger understanding of environmental health issues and show more profound changes in behaviors related to sanitation and hygiene.

Building on this, Surianto et al. (2023) observed that adopting a long-term strategy in health education initiatives in Indonesia, which ensures community involvement at all stages—from design to evaluation—significantly enhances local capacity. Their findings suggest that when communities are actively engaged in shaping and executing these programs, they are more committed to maintaining the practices introduced. Programs with strong community participation are particularly effective in transforming sanitation and hygiene behaviors, while also fostering a deeper understanding of the importance of sound environmental health practices.

On a broader scale, Levy et al. (2020) found that in various developing nations, including Indonesia, health education programs that span extended periods, incorporating diverse, continually updated interventions, have a far greater impact in creating lasting changes. This approach involves a combination of

formal learning, technical training, and direct community participation in environmental health decision-making. The success of these programs is not solely defined by knowledge gains but by tangible shifts in behaviors around waste management, clean water practices, and sanitation.

Moreover, Suryani et al. (2022) stressed that the continuity of health education programs relies heavily on robust support from both the government and private sector. They advocate for stable financial backing from local governments and for the private sector to contribute essential resources and technology to ensure the programs' longevity. This sustained support is critical to prevent programs from halting after the initial phase, allowing for ongoing updates to teaching materials and methods, in line with technological progress and evolving community needs.

2. Elements Driving Program Success

The outcome of health education initiatives is shaped by a web of interrelated elements. A crucial factor is the relevance and quality of the educational content shared. When the material is customized to meet local needs and conveyed by skilled health professionals, it significantly boosts the community's grasp of and receptivity to health messages. This mirrors the observations made by Wahyu et al. (2022), who underscored the necessity of adapting educational programs to the local setting and integrating expert health workers into the process.

In addition, both governmental backing and community engagement are pivotal to the program's success. Suryani (2023) pointed out that policies promoting community-driven health programs, such as funding allocations, play a critical role in ensuring the program's longevity and broad reach. Moreover, Hadi et al. (2023) discovered that involving the community in both the design and execution stages of the program boosts participation rates and maximizes the program's impact.

Further research highlights additional components that affect the success of health promotion efforts. Manggala et al. (2021) found that local activities, strong inter-sectoral collaboration, and ensuring long-term program viability are fundamental to addressing issues like stunting in Sumedang. These insights reaffirm the value of a comprehensive approach that engages diverse parties and employs a wide range of strategies to optimize the effectiveness of health education initiatives.

3. Revolutionizing Health Education Approaches

Health education strategies have undergone a transformative shift, largely driven by the incorporation of cutting-edge digital technology and grassroots, community-focused models. The utilization of digital platforms like mobile applications and social media channels has emerged as a powerful tool to engage a wider population, fostering an understanding of the critical role of environmental health management. Sarwoyo et al. (2024) discovered that incorporating digital learning enhances participants' ability to navigate and leverage technology for effective health education delivery.

Furthermore, the shift toward digital healthcare systems represents a pivotal advancement in optimizing healthcare services. Amalia (2024) emphasized the profound impact of digital health on improving both the quality and accessibility of health services. For instance, the adoption of electronic medical records plays a crucial role in streamlining and amplifying healthcare efficiency.

Equally impactful are community-based approaches that engage local influencers in disseminating vital health information. Programs designed to educate communities on using digital tools in the context of health have significantly bolstered public health literacy. In essence, the convergence of innovative digital tools and localized community approaches offers unparalleled potential to elevate public health education. By harnessing the power of technology and empowering local leaders, these methods ensure that health education initiatives are both impactful and sustainable, driving substantial improvements in overall community health (Pongtambing, 2024).

4. Obstacles in Executing Health Education Initiatives

The implementation of health education strategies in Indonesia encounters a range of multifaceted challenges. A significant roadblock is the lack of sufficient resources, including both financial limitations and a shortage of qualified instructors. The scarcity of funding and healthcare professionals in remote areas frequently obstruct the application of health policies (Nasution et al., 2024). Additionally, social and cultural influences often hinder the effectiveness of these education initiatives. Differences in health practices, beliefs, and cultural norms are common barriers to the long-term success of health development efforts (Nurdin & Lestari, 2024).

To address these challenges, it is crucial to adopt a more inclusive approach. Involving local stakeholders and tailoring education programs to reflect the cultural values of specific communities can foster greater engagement and improve program outcomes. Issues faced during program rollouts include inadequate experience, skills, and knowledge among local health workers, low community awareness, cultural and social traits, misleading media health messages, and insufficient backing from key stakeholders. These barriers have detrimental effects on the continuation and sustainability of health promotion initiatives (Reskiaddin et al., 2020).

In summary, the insights from this review emphasize that effective health education, when structured and integrated with technology, supported by robust government policies and active community participation, is vital to improving competencies in environmental health management. However, the success of such educational programs is highly dependent on community involvement, adequate resource allocation, and ensuring their long-term sustainability. Therefore, these programs should be customized to meet local needs, prioritize sustainability, and tackle the challenges that arise from social, cultural, and resource-related factors.

CONCLUSION

Based on the insights gathered from the literature review, it's clear that health education is pivotal in bolstering community abilities to manage environmental health. Programs that are well-structured and maintained over time have shown to be far more successful in instigating lasting changes in behaviors related to sanitation, cleanliness, and environmental stewardship. The effectiveness of these initiatives hinges on several essential elements, including the relevance of the content tailored to local contexts, the expertise of health professionals, and strong support from both the government and active community involvement. Innovative teaching methods, particularly those incorporating digital technologies and community-driven approaches, have revolutionized the way educational outreach is carried out, broadening its impact and enhancing its success rate. Technology not only streamlines the flow of information but also significantly improves the population's health literacy. However, challenges persist in rolling out health education programs, including resource scarcity, insufficient cross-sector collaboration, and difficulty in customizing programs for the specific needs of different regions. To address these hurdles, a multifaceted approach is essential, involving cooperation among various stakeholders, empowering health professionals, and ensuring that policies provide ongoing support for these educational initiatives. In conclusion, a dynamic, inventive, and collaborative education model is crucial for equipping communities with the tools they need to effectively and sustainably manage environmental health.

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