Enhancing Adolescent Health Literacy Through A Community-Based Educational Intervention: A Pilot Study In A Rural Indonesian Setting

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Abstract.

Access to accurate and meaningful health information remains a major challenge for adolescents living in rural areas, which negatively affects their level of health literacy, particularly in relation to general physical health and mental well-being. To address this issue, this preliminary study was designed to examine the extent to which a brief community-based educational intervention could enhance the health literacy capacity of adolescents in rural Indonesia. A total of 33 adolescents aged between 11 and 18 participated in two structured educational sessions, which focused on topics such as nutrition, personal hygiene, emotional regulation, stigma reduction, and peer counseling techniques. Interactive learning activities—including group discussions, scenario-based case problem solving, and role-playing—were employed to strengthen participant engagement and contextualize the material to the local setting. Changes in participants' knowledge were evaluated using a structured questionnaire administered before and after the intervention, covering two main dimensions: general health literacy and mental health literacy. A paired t-test was applied to analyze differences between pretest and posttest scores. The findings revealed a significant improvement in general health literacy, with mean scores increasing from 79.9 (SD = 17.3) to 94.9 (SD = 7.9; $p < 0.01$). A more substantial improvement was observed in mental health literacy and peer counseling skills, with mean scores rising from 31.82 (SD = 24.43) to 81.82 (SD = 20.98; $p < 0.001$). Overall, the results indicate that participatory, short-term educational models that are aligned with local cultural values hold considerable promise for strengthening adolescents' conceptual understanding and emotional engagement with health-related issues, particularly in areas with limited access to healthcare services.

Keywords: *Adolescent health literacy; mental health education; peer counseling; participatory learning; community intervention and Indonesia.*

I. INTRODUCTION

Adolescence is widely recognized as a critical developmental phase, marked by multidimensional transitions—biological, psychological, and socio-environmental—that significantly shape an individual's lifelong health behaviors and attitudes. In recent decades, there has been a growing body of literature emphasizing the urgent need to strengthen adolescent health literacy as a foundational component of public health promotion (Sørensen et al., 2012). According to the World Health Organization (WHO), adolescents comprise over 16% of the global population, and their access to comprehensive health information is essential to achieving multiple Sustainable Development Goals (SDGs), particularly those related to health, education, and gender equity.Health literacy, defined as an individual's ability to obtain, interpret, and apply health information for sound decision-making (Nutbeam, 2000), is especially vital during adolescence—a period marked by both heightened vulnerability and the emergence of behavioral autonomy (Manganello, 2007). However, in low- and middle-income countries (LMICs), adolescent health literacy remains substantially low. In Indonesia, this challenge is magnified in rural areas due to persistent infrastructural, socioeconomic, and digital divides. Findings from Kayalkar & Dmello, (2024) and Roiefah et al., (2021)

highlight that adolescents in remote regions struggle to access reliable health information, contributing to misconceptions, poor preventive behavior, and social stigma—especially concerning mental health. Regionally, similar patterns are evident across Southeast Asia.

In the Philippines, a national survey conducted by the Department of Health in 2023 revealed that over 45% of adolescents lacked sufficient understanding of reproductive health and mental well-being (Arnold et al., 2025). In Thailand, a study by Chansukree et al., (2022) found that although access to digital media has improved, disparities in digital health literacy persist—especially among rural and low-income youth. Meanwhile, Vietnam's Ministry of Health reported in 2022 that only 35% of adolescents demonstrated adequate health literacy, and less than 20% were confident in accessing mental health services. These statistics signal a broader regional issue, where structural inequalities intersect with cultural taboos to hinder effective health education. Comparative findings across these countries highlight that while policy frameworks exist, implementation often lacks the contextual sensitivity and community involvement necessary to reach at-risk adolescents effectively. Within the Indonesian context, formal institutional efforts—such as the School Health Effort (UKS) and community-based programs through Puskesmas—remain limited in their reach and effectiveness (Pribadi et al., 2022). These initiatives are often top-down in nature, overly didactic, and not tailored to adolescents' evolving needs and preferences. The absence of participatory pedagogical methods has resulted in disengagement, particularly among out-of-school youth and those from socioeconomically marginalized backgrounds. Moreover, many adolescents are left without sufficient support in navigating psychosocial challenges, making them vulnerable to misinformation, social isolation, and untreated mental health conditions.

Compounding this issue are cultural and religious norms prevalent in many Southeast Asian societies that hinder open dialogue around mental health. In predominantly conservative communities, mental distress is often associated with moral weakness, spiritual failure, or family dishonor. As noted by Lindow et al., (2020), this stigma leads many adolescents to suppress emotional difficulties or avoid seeking help altogether. In Muslim-majority settings like Indonesia and Malaysia, and Buddhist-majority countries such as Thailand and Myanmar, there is often a tension between religious beliefs and evidence-based psychological interventions. While spiritual frameworks can offer resilience, they can also inadvertently reinforce silence and internalization when not harmonized with modern mental health education. Thus, any initiative aimed at improving adolescent mental health literacy must be culturally sensitive, respectful of local belief systems, and positioned within trusted community structures.Amid these challenges, emerging models of participatory learning—emphasizing dialogue, narrative-based learning, and peer-led support—have shown promising outcomes. These approaches not only improve knowledge acquisition but also foster emotional connection, self-efficacy, and social trust (Yunieswati et al., 2022). Peer counseling, in particular, offers an accessible and culturally resonant avenue for mental health education, especially when formal clinical services are limited or stigmatized. Erikson's psychosocial theory reinforces the role of peer interaction in identity development and emotional regulation, validating the inclusion of peer-based strategies in adolescent health programming.

This study seeks to address a critical gap in the literature by evaluating a short-duration, community-based educational intervention targeting adolescents in a rural Indonesian setting. The program integrates active learning methods and culturally responsive peer counseling components to improve health literacy in two key domains: general physical health and mental health awareness. Through a quasi-experimental pretest–posttest design, this study aims to generate empirical evidence on the effectiveness of non-formal, localized education models in advancing adolescent health outcomes. Furthermore, it contributes to regional discussions on how community-driven strategies can complement formal systems and help bridge persistent health literacy gaps across Southeast Asia.

II. METHODS

This study employed a quasi-experimental design with a single-group pretest–posttest approach to evaluate the effectiveness of a community-based educational program in enhancing health literacy among adolescents. A total of 33 participants aged between 11 and 18 were involved in the intervention, which was

conducted in a rural area of Indonesia. Participants were recruited purposively based on their availability and willingness to attend the entire series of structured educational activities.The intervention comprised two structured learning sessions, each lasting approximately one hour. The first session focused on issues related to adolescent physical health, including nutrition, personal hygiene, and preventive measures against illness. The second session aimed to raise awareness about mental health by addressing stress management strategies, emotional regulation techniques, and stigma reduction efforts. Both sessions also incorporated peer counseling activities to foster reciprocal support and encourage autonomous help-seeking behaviors. A participatory pedagogical approach was adopted throughout the sessions, which included guided group discussions, scenario-based case analysis, and role-playing exercises.

These interactive formats were designed to align with the rural adolescent context and to promote both emotional and intellectual engagement. All sessions were facilitated by trained educational personnel who had received specialized training and possessed a deep understanding of the demographic and psychosocial characteristics of the local adolescent population.Knowledge change was assessed using a structured questionnaire specifically developed for this study. The instrument measured two main domains: general health literacy and mental health literacy, including components related to peer-based counseling. Although full-scale psychometric validation of the instrument had not yet been conducted, an initial pilot test was performed to ensure clarity and comprehension within a comparable target group.Statistical analysis was conducted using paired-sample t-tests to evaluate significant differences between pretest and posttest scores in each domain. Data were processed using statistical software, with the threshold for significance set at $p < 0.05$.Ethical considerations were fully observed. Written informed consent was obtained from all participants and their guardians prior to data collection. All procedures for data collection and reporting were carried out anonymously, in accordance with prevailing research ethics standards to ensure the confidentiality of participant identities.

III. RESULTS AND DISCUSSION

This study focused on evaluating the outcomes of a short-term, community-based educational intervention aimed at enhancing two key dimensions of adolescent health literacy: (1) general health awareness and (2) mental health knowledge, including familiarity with peer counseling strategies. All 33 adolescent participants completed both the structured educational sessions and the pretest–posttest evaluations. The statistical results indicate a marked improvement across both dimensions, reinforcing the potential of brief, participatory interventions in resource-constrained environments.Demographic analysis revealed that the majority of participants were female (63.63%), while males constituted 36.37% of the sample. In terms of age, most respondents were between 15 and 16 years (42.43%), followed by those aged 17 to 18 years (30.30%). Smaller proportions were recorded among adolescents aged 13 to 14 years (21.21%) and 11 to 12 years (6.06%). This distribution reflects a diverse representation of middle-to-late adolescent age groups.

Table 1. Participant Characteristics

Characteristics	Frequency	Percentage
Gender		
Male	12	36.37
Female	21	63.63
Total	33	100.00
Age group		
11-12	2	6.06
13-14	7	21.21
15-16	14	42.43
17-18	10	30.30
Total	33	100.00

In the domain of general health literacy, the average score improved significantly from 79.9 (SD = 17.3) at pretest to 94.9 (SD = 7.9) at posttest ($p < 0.01$). Notably, the minimum score also rose considerably—from 30 to 83—suggesting that even participants with the least baseline knowledge benefitted meaningfully from the intervention. This reduction in knowledge disparity among participants is particularly

important, as it indicates that the intervention was not only effective for those already familiar with health topics but also accessible and impactful for those starting from a position of disadvantage.

Table 2. Comparison of Pre-Test and Post-Test Scores

Domain	Min (Pre)	Max (Pre)	Mean (Pre)	SD (Pre)	Min (Post)	Max (Post)	Mean (Post)	SD (Post)	*p*-value
Health Problems Literacy	30	100	79.9	17.3	83	100	94.9	7.9	< 0.01
Mental Health & Peer Counseling	0	100	31.82	24.43	25	100	81.82	20.98	< 0.001*

A more dramatic shift occurred in the mental health literacy domain, where the average score increased from 31.82 (SD = 24.43) to 81.82 (SD = 20.98) ($p < 0.001$). Importantly, several participants who initially scored zero on the pretest achieved posttest scores of 25 or higher, highlighting the intervention's ability to introduce and solidify foundational concepts around emotional regulation, stress management, and destigmatization. This sharp increase also reflects the significant gap in mental health literacy prior to the intervention—a finding consistent with previous studies conducted in Indonesia and elsewhere in Southeast Asia (González-Sanguino et al., 2024; Kayalkar & Dmello, 2024; Putri et al., 2025). These quantitative improvements are more than statistical artifacts—they point toward the psychological and social accessibility of the intervention design. The structured learning sessions utilized guided group discussions, scenario-based case analysis, and role-playing activities. These techniques are rooted in constructivist learning theory, which emphasizes the importance of active engagement, peer collaboration, and contextual relevance in shaping meaningful knowledge acquisition. Particularly in adolescent populations, such participatory approaches foster greater emotional involvement, which in turn enhances retention and behavior transfer (Townsend & Mary, 2014).Moreover, the inclusion of peer counseling components was central to the intervention's success. Adolescents are more likely to disclose concerns, seek advice, and internalize messages from peers rather than authority figures, especially on sensitive topics such as emotional well-being or reproductive health.

Erikson's theory of psychosocial development highlights the salience of peer influence during adolescence, suggesting that identity formation and autonomy are largely negotiated through peer dynamics. This theoretical grounding explains why even a short-term exposure to peer counseling strategies can catalyze significant cognitive and emotional shifts.The results also resonate with prior community-based health initiatives in both developed and developing countries. For instance, (Mancone et al., (2024) demonstrated that digital peer-supported food literacy programs in rural Italy achieved significant outcomes even with limited contact hours, provided the content was culturally tailored and contextually situated. Similarly, Mananohas et al., (2023) emphasized the success of the "Ayah ASI Indonesia" campaign in utilizing social media to disseminate accurate, relatable health messages through trusted peer networks.From a policy perspective, these findings carry several important implications. First, they provide empirical support for integrating community-based models into existing national adolescent health frameworks. In Indonesia, programs such as UKS (School Health Efforts), PIK-R (Youth Information and Counseling Center), and Puskesmas outreach services can be strengthened by adopting interactive, short-format modules that are both participatory and culturally embedded. Rather than replacing formal programs, such interventions can act as agile complements—especially in rural or under-resourced communities where formal infrastructure is weak or underutilized.Second, the success of this low-cost, low-tech intervention challenges the assumption that health promotion must be technologically advanced or long in duration to be effective.

In fact, brevity may be a strength when programs are designed with intentional engagement, emotional relevance, and contextual nuance. This is particularly relevant in settings where adolescents must balance school, work, and family obligations, leaving limited time for prolonged interventions. A scalable and efficient model—such as the one presented here—may therefore be more feasible for large-scale deployment.Third, the findings speak to a broader shift needed in adolescent health education: from information delivery to empowerment. While traditional methods focus on conveying health facts, participatory approaches emphasize agency, resilience, and mutual support. This shift aligns with global calls

for youth-centered public health models that honor the lived experiences, languages, and social networks of young people (WHO, 2022). Programs that fail to account for these dimensions risk reinforcing disinterest or even resistance among adolescent participants.Fourth, the integration of peer counseling in the mental health domain suggests that stigma reduction is not only possible but can be achieved swiftly when youth feel safe, respected, and understood. The improved scores in this domain suggest increased comfort with the language of emotional well-being, greater openness to help-seeking, and reduced internalized stigma—outcomes that have long-term implications for adolescent mental health trajectories.

As supported by Wardaningsih et al., (2023) and Yang et al., (2024), peer-led interventions may act as entry points for broader psychosocial support systems, especially in contexts where formal mental health infrastructure is sparse.That said, it is important to consider the limitations of this pilot study. The absence of a control group means that causality cannot be definitively attributed to the intervention. The self-developed measurement instrument, although piloted for clarity, lacks full psychometric validation, which may influence the precision of the results. Moreover, the study did not conduct follow-up assessments to evaluate the long-term sustainability of the observed knowledge gains or behavioral changes.Nevertheless, these constraints do not diminish the importance of the findings. Rather, they highlight areas for future inquiry. Longitudinal studies with larger, more diverse samples are needed to assess how knowledge acquired through short-term interventions translates into sustained behavior. Mixed-method evaluations incorporating qualitative feedback could further enrich our understanding of how adolescents internalize and apply the concepts introduced.Finally, this study contributes to a growing regional conversation about health equity, adolescent agency, and community engagement. The Southeast Asian context—with its rich cultural diversity, uneven development patterns, and pluralistic health beliefs—requires models that are adaptable, respectful, and evidence-driven. By centering adolescents as co-creators of their learning and by grounding interventions in the social fabric of rural life, this study offers a compelling case for reimagining how health literacy can be cultivated—not through institutions alone, but through communities that empower their youth from within.

IV. CONCLUSION

This study presents empirical evidence that even a brief, community-based educational intervention can generate significant improvements in adolescent health literacy across two vital domains: general health knowledge and mental health awareness. The intervention, grounded in participatory pedagogy and enhanced by culturally resonant peer counseling strategies, proved effective in elevating both conceptual understanding and emotional responsiveness among rural adolescents in Indonesia. These findings are particularly compelling given the resource limitations and socio-cultural sensitivities often present in rural health education settings.One of the most noteworthy outcomes of this intervention was the substantial improvement in mental health literacy—a domain traditionally marginalized within both formal education systems and public discourse. The increase in knowledge, coupled with the apparent reduction in stigma, suggests that adolescents are not only capable of understanding complex psychological topics but also eager for safe spaces to explore them. The use of peer counseling as both an educational method and a behavioral model emerged as a crucial success factor, enabling trust, relatability, and self-expression.The broader implications of this research point to the potential scalability and adaptability of this model within national adolescent health frameworks such as UKS, PIK-R, and community outreach programs via Puskesmas. Unlike top-down initiatives that often fail to engage youth meaningfully, this model emphasizes co-ownership, agency, and alignment with local cultural values—attributes essential for sustainable health behavior change.

Policymakers and health practitioners should consider embedding similar interventions into formal and informal youth development platforms, particularly in underserved areas.Moreover, the study underscores the need to reposition health education not merely as information dissemination but as a dialogic, context-sensitive process rooted in empowerment. As Southeast Asian countries face parallel challenges in adolescent health, models such as the one evaluated here could offer a replicable and adaptable framework for advancing youth health literacy and resilience across the region.Future research should aim to

expand on these findings through longitudinal designs, psychometrically validated instruments, and mixed-methods approaches. By continuing to bridge empirical inquiry with grounded community practice, we can build more inclusive, impactful, and youth-responsive health education systems—systems that not only inform but also transform the next generation.

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