JKKI: Jurnal Kedokteran dan Kesehatan Indonesia
Indonesian Journal of Medicine and Health
Journal homepage: https://journal.uii.ac.id/JKKI
P-ISSN 2085-4145 | E-ISSN 2527-2950 || JKKI 2025;16(3): 360-371

The effectiveness of mental health education on improving adolescents' knowledge of depression prevention

Indra Ruswadi,*[1] Jummai Wennie,[2] Masliha,[3]

[1]Department of Health, Politeknik Negeri Indramayu, West Java, Indonesia
[2]Department of Nursing, Babcock University, Ogun State, Nigeria
[3]Department of Nursing, STIKes Aksari Indramayu, West Java, Indonesia

Article Info:

Keywords: mental health education; adolescent knowledge; depression prevention; community-based intervention; pre-experimental study

Article History:

Received: April 11, 2025
Accepted: October 29, 2025
Online: December 27, 2025

***Corresponding author:**
indra@polindra.ac.id

DOI: 10.20885/JKKI.Vol16.Iss3.art4

Original Article

ABSTRACT

Background: Mental health problems, particularly depression, among adolescents in a community have become a growing public health concern globally. Early preventive efforts are essential to reduce the burden of depression. Educational interventions in the community are one of the recommended strategies.
Objectives: This study aimed to determine the effectiveness of mental health education in increasing adolescents' knowledge of depression prevention in a community.
Methods: This study employed a pre-experimental one-group pretest-posttest design involving 60 adolescents selected through purposive sampling in a rural community setting. The data were collected using a validated knowledge questionnaire on depression prevention and analysed using paired-sample t-tests in SPSS version 28.
Results: The findings revealed a significant increase in the mean knowledge score after the intervention (pretest mean = 11.82 ± 2.41; posttest mean = 16.45 ± 1.89; $p < 0.001$). These results indicate that the mental health education intervention effectively improves adolescents' knowledge of depression prevention.
Conclusion: Mental health education can be an effective strategy in improving adolescent knowledge of depression prevention in community settings. This finding supports the importance of community-based educational programs as part of sustainable mental health promotion aligned with the Sustainable Development Goals.

INTRODUCTION

Mental health is increasingly recognized as a critical component of overall public health, with depression among adolescents emerging as one of the most pressing global concerns. The World Health Organization (WHO) estimates that more than 13% of adolescents globally suffer from mental disorders, and depression is a leading contributor to the global burden of disease for this age group. Alarmingly, suicide ranks as the fourth leading cause of death among 15–19-year-olds.[1] The situation is not only prevalent in high-income countries but also increasingly reported in low- and middle-income regions. In Southeast Asia, cultural stigma, lack of awareness, and insufficient service delivery systems make mental health one of the most neglected health domains.[2] Indonesia Health Survey (SKI) reported that 9.8% of adolescents experienced emotional mental health problems, while only a small fraction received clinical interventions.[3] In West Java, the Provincial Health Office recorded a notable increase in adolescent mental health complaints, particularly linked to anxiety and mood disorders. Based on the 2023 Indramayu District Health Profile, adolescent psychological complaints ranked among the top five reasons for visits to Community Health Centres (Puskesmas). However, youth-friendly mental health

services remain scarce, underfunded, and largely unavailable outside urban centres.[4]

The developmental transition of adolescence makes this group uniquely vulnerable to mental health challenges. It is a phase characterized by rapid biological changes (e.g., puberty, hormonal shifts), complex emotional evolution (e.g., identity search, mood fluctuations), and shifting social dynamics (e.g., increased peer dependence, academic and family expectations).[4] Adolescents are often caught between dependency and emerging independence, navigating life with limited emotional coping mechanisms. They are expected to assume more responsibility but frequently lack the cognitive and emotional tools to manage some pressures effectively.[5] Stressors like peer pressure, online harassment, academic competition, relationship challenges, and exposure to drugs and alcohol can trigger or exacerbate depressive symptoms.[6] In many Indonesian families, cultural taboos against openly discussing feelings or seeking psychological help further aggravate the problem. The traditional view that mental health concerns are signs of personal weakness continues to discourage youth from expressing emotional distress.[7] This silence increases risks for undiagnosed depression and leads to long-term consequences such as self-isolation, substance abuse, and suicidal ideation.[8] Adolescents in rural and semi-urban areas often face additional challenges, limited digital literacy, lower parental awareness, and a lack of mental health resources, making prevention and early intervention even more crucial.[9]

Existing literature provides ample evidence on the effectiveness of mental health education in improving adolescent knowledge, attitudes, and behaviours. Studies across various regions have demonstrated that tailored educational programs reduce stigma, increase awareness, and empower youth to seek help.[10] However, these programs are largely implemented in formal school settings, leaving a significant number of adolescents, especially those out of school, in informal education systems or living in remote areas, without access to such resources.[11] In Indonesia, educational inequities and infrastructure gaps limit the scalability of school-based interventions. Community-based health infrastructure, such as *Posyandu Remaja* (Adolecent Integrated Health Post), *Karang Taruna* (Youth Forums), and village-level health promotion programs, is not yet fully integrated with mental health education strategies.[12] These platforms hold potential but lack standardized modules, facilitator training, and consistent monitoring mechanisms.[13] What is already known is that multi-sectoral collaboration (health, education, and community sectors), participatory learning, and culturally sensitive content contribute to successful program outcomes. Additional known strategies include: 1) youth-led peer education, 2) integration of digital media tools, 3) structured group discussions, 4) role-play simulations, and 5) the involvement of parents and caregivers in parallel sessions to reinforce messages at home.[14] However, the implementation of these elements remains fragmented and is seldom rigorously evaluated in real-world community settings.

The gap in adolescent mental health promotion, particularly outside the school context, remains significant.[15] There are limited empirical studies on how structured education programs, delivered through community platforms, affect adolescents' knowledge about depression prevention.[16] Most existing studies do not disaggregate data based on location, type of schooling, or community access. This leaves out a large subset of vulnerable adolescents who may not benefit from mainstream interventions.[17] Furthermore, while Indonesia has national policies supporting adolescent health (e.g., the Adolescent Health Strategic Plan and the National Mental Health Action Plan), their operationalization at the community level remains weak. Health promotion at the grassroots level often focuses more on physical health and nutrition than psychological well-being. There is also a lack of accessible educational materials adapted to local languages, beliefs, and cultural norms.[18] The novelty of this study lies in its community-based intervention model, which not only departs from school-based education but also empowers local youth health cadres and utilizes existing village structures. It represents a convergence of theory and practice, aiming to demonstrate that community-based education can be as effective as institutional learning in addressing sensitive mental health topics, such as depression.

Therefore, this study seeks to fill the gap by developing and evaluating a comprehensive mental health education program focused on preventing depression among adolescents in the community setting of Indramayu, West Java. Using a one-group pretest-posttest design, this study

assesses knowledge improvement before and after the intervention. The modules used are culturally tailored, interactive, and structured based on adolescents' developmental psychology. Delivered by trained facilitators including peer educators, public health nurses, and local youth leaders, the intervention emphasizes inclusivity, simplicity, and engagement. The novelty of this study lies in its focus on younger adolescents (aged 13–18), a group that has been relatively underserved in prevention interventions at the junior high school level. By addressing this demographic in a community setting outside formal schooling, the study contributes a new perspective to adolescent mental health promotion. In addition, it is expected to offer practical recommendations for integrating mental health education into community-based youth initiatives across Indonesia. The study's outcomes also aim to support policy efforts aligned with the Sustainable Development Goals (SDGs), particularly Goal 3 (Good Health and Well-being), and the Ministry of Health's program to strengthen promotive and preventive services. Ultimately, this affirms the urgency of equipping adolescents with the knowledge and tools to understand, prevent, and respond to depression, wherever they are.

METHODS

Study Design

This study utilized a pre-experimental design with a single-group pretest-posttest model to assess the effectiveness of a structured, community-based mental health education program in increasing adolescents' knowledge about depression prevention. Its design was chosen due to its practical application in field-based interventions, especially in community health settings with limited resources. By comparing data collected before and after the intervention within the same group, this design enabled researchers to measure changes attributable to the educational program. Although it does not include a control group, this approach is widely accepted as a preliminary method in health promotion research, particularly for pilot studies to assess feasibility, effectiveness, and short-term outcomes of an intervention. Moreover, this design provides valuable insights into the potential impact of educational sessions, which can inform the development of more rigorous or comparative study designs in the future.

Setting and Participants

This study was conducted over three months, from October to December 2024, within the working region of Puskesmas Cidempet, located in Indramayu Regency, West Java, Indonesia. The area was selected based on its active adolescent community groups (such as *Posyandu Remaja*) and its relatively high incidence of adolescents' psychosocial complaints reported in previous community health outreach records. A total of 60 adolescents aged between 13 and 18 years were recruited using purposive sampling. This non-probability testing strategy was considered suitable given the particular nature of the mediation and was designed to ensure that the participants met predefined criteria for consideration. In pre-experimental instructional inquiry, especially in wellbeing instruction, purposive examination is commonly utilized to guarantee commonsense execution and homogeneous introduction to the mediation substance. Based on methodological recommendations, a group size of 30 to 60 participants is considered statistically adequate to detect meaningful differences using paired comparisons.

The inclusion criteria were as follows. First, the adolescents were aged between 13 and 18 years. Second, they were willing to participate voluntarily, with informed consent (or parental permission when legally required). Third, they were able to study and write in Indonesian to understand the instructions. Fourth, they were dynamic or standard individuals of nearby pre-adult groups, such as *Posyandu Remaja* or *Karang Taruna*. They were not currently under clinical psychological or psychiatric treatment for any diagnosed mental health condition.

Meanwhile, the exclusion criteria included the following. The first was teenagers with a restorative history of neurological conditions (e.g., epilepsy, brain harm), or cognitive and learning inabilities that will disable comprehension or cooperation. The second was adolescents who did not complete both the pretest and posttest sessions. The third was participants who had received any formal counselling or structured education program regarding depression or mental

health in the past six months, as prior exposure could influence baseline knowledge and confound the results.

Intervention

The intervention consisted of a single 60-minute structured session focusing on mental health education, specifically targeting adolescent depression awareness and prevention. It was conducted by a team comprising trained public health nurses and elementary-level mental health educators. The instructions were created in accordance with the World Health Organization (WHO) guidelines for advancing pre-adult mental well-being and were adjusted to be relevant to the local culture and language.

The session was organized into four core modules. Module 1 - Understanding Depression - introduced the concept of depression, common signs and symptoms (emotional, cognitive, physical, behavioural), and common myths or misunderstandings in society. It was contextualized with local examples to enhance comprehension. Module 2 - Contributing and Protective Factors - highlighted various contributors to depression, such as peer pressure, academic stress, family conflict, social media exposure, substance use, and emotional neglect. It also emphasized protective factors, including supportive relationships, resilience-building activities, and positive self-perception. Module 3 - Coping Strategies - introduced practical and effective techniques such as breathing exercises, journaling, time management, regular physical activity, and sleep hygiene. Group discussions encouraged adolescents to reflect on strategies they already used and how to strengthen them. Module 4 - Reducing Stigma and Seeking Help - focused on reducing stigma and empowering participants to seek help. It included identifying early warning signs that require support, choosing trusted adults or professionals, and becoming familiar with accessible mental health services in the community.

The delivery method was highly interactive. Tools used included PowerPoint slides, printed handouts, short animated videos, and small-group discussions. The facilitators utilized participatory strategies, empowering participants to ask intelligent questions throughout the session. At the conclusion, the participants locked into a key message test to fortify learning focuses. Each participant was given a pamphlet summarizing the session materials and a list of neighbourhood mental well-being back contacts, including school counsellors, open well-being centres, and online resources.

Instruments to evaluate information alteration, a 20-item multiple-choice survey, were administered some time recently, and after the intervention. The instrument was adapted from the WHO Adolescent Mental Health Literacy Toolkit, with modifications based on expert panel input to ensure cultural appropriateness and content relevance. Each item had one correct answer and three distractors, with a total possible score of 0–20.

The item breakdown was as follows. Eight questions centred on distinguishing misery side effects and misinterpretations. Four questions examined hazard and defensive variables. Four questions evaluated knowledge of healthy coping strategies, and 4 questions assessed understanding of help-seeking behaviour and available support services. Scoring was straightforward: one point for each correct answer, zero for incorrect. Knowledge levels were then categorized as follows: Deficient: 0–10, Moderate: 11–15, Satisfactory: 16–20, and Moderate to good: 11–20 range for overall interpretation.

The instrument's legitimacy was built up through substance approval by three specialists in psychiatric nursing and community mental health. To assess unwavering quality, a pilot test was conducted with a comparable population (n=20), and Cronbach's alpha yielded an estimate of 0.82, indicating high internal consistency.

Data Collection Procedure

Data collection was divided into two stages. The pretest was administered immediately before the education session, and the posttest was administered directly after the intervention. Trained enumerators facilitated the process, ensuring clarity in instructions and assisting participants with any technical difficulties. The participants were identified only by a unique code

number to ensure anonymity and confidentiality. No personal identifying information was recorded on the questionnaires. The procedure was conducted in a classroom-style setting, with minimal distractions and appropriate seating arrangements.

Data Analysis

All collected data were analysed using IBM SPSS Statistics version 28. Descriptive statistics (mean, standard deviation, frequency distribution) were used to summarize participant characteristics and knowledge levels. To assess the effect of the intervention, a paired-sample t-test was employed to compare pretest and posttest scores within the same group. A p-value of less than 0.05 was considered statistically significant. The analysis aimed to determine whether there was a meaningful increase in knowledge scores post-intervention, supporting the hypothesis that structured mental health education can improve adolescent understanding of depression and prevention.

Ethical Considerations

Ethical clearance for this study was obtained from the Health Research Ethics Committee of STIKes Aksari Indramayu (Reference Number: 241/KEPK-STIKes Aksari/2024). All participants and their guardians were fully informed about the study's purpose, procedures, potential risks, and benefits. Written informed consent was obtained from each adolescent or their legal guardian before participation. Ethical principles outlined in the Declaration of Helsinki were followed, ensuring voluntary participation, the right to withdraw at any time without penalty, and the assurance of privacy and confidentiality. Participants who displayed signs of emotional distress during the session were referred to appropriate local mental health services for further support.

Results

Table 1 presents the demographic profile of the participants. Most were early adolescents and predominantly female, and the majority attended junior high school. This distribution supports the strategic focus on early adolescence as a critical period for strengthening mental health literacy.

Table 1. Respondent demographic characteristics (n = 60)

Variable	Category	Frequency (f)	Percentage (%)
Age (years)	13–15	32	53.3
	16–18	28	46.7
Gender	Male	24	40.0
	Female	36	60.0
Education Level	Junior High School	33	55.0
	Senior High School	27	45.0

Table 2 demonstrates a substantial improvement in knowledge categories following the intervention. Before the session, only a minority of adolescents had high knowledge, whereas after the intervention, the vast majority fell into the high category. This shift indicates a strong positive effect of the educational program.

Table 2. Distribution of knowledge categories before and after education (n = 60)

Knowledge Category	Pretest f (%)	Posttest f (%)
Low (≤10)	14 (23.3%)	0 (0.0%)
Moderate (11–15)	34 (56.7%)	9 (15.0%)
High (≥16)	12 (20.0%)	51 (85.0%)

Table 3 demonstrates a significant increase in average knowledge scores after the intervention, with statistical analysis confirming the effectiveness of the mental health education program ($t = 14.672$, $p < 0.001$).

Table 3. Mean knowledge scores before and after intervention (n = 60)

Variable	Mean ± SD (Pretest)	Mean ± SD (Posttest)	t-value	p-value
Knowledge Score	11.82 ± 2.31	16.45 ± 1.89	14.672	<0.001*

*p < 0.05 (Statistically significant)

Table 4 offers a detailed breakdown of participants' responses to each knowledge item before and after the intervention. The most significant gains were observed in questions related to coping strategies (Items 11–14) and accessing help (Items 15–18), which initially scored lower but showed significant improvement after the intervention. For example, only 30% identified journaling as a coping strategy before the session, increasing to 83.3% afterward.

Table 4. Per-Item knowledge response comparison (n = 60)

No.	Knowledge Item Topic	Correct Pretest n (%)	Correct Posttest n (%)
1	Definition of depression	34 (56.7)	60 (100.0)
2	Common symptoms	28 (46.7)	57 (95.0)
3	Physical signs of depression	25 (41.7)	55 (91.7)
4	Emotional indicators	36 (60.0)	59 (98.3)
5	Misconception: "Depression is just sadness"	30 (50.0)	56 (93.3)
6	Risk factors: family conflict	40 (66.7)	58 (96.7)
7	Peer pressure as a risk factor	32 (53.3)	56 (93.3)
8	Internet/social media influence	26 (43.3)	54 (90.0)
9	Protective factor: social support	29 (48.3)	57 (95.0)
10	Positive family communication	31 (51.7)	55 (91.7)
11	Coping strategy: journaling	18 (30.0)	50 (83.3)
12	Stress relief: breathing techniques	15 (25.0)	47 (78.3)
13	Role of physical activity	27 (45.0)	53 (88.3)
14	Time management	22 (36.7)	49 (81.7)
15	Recognizing when to seek help	33 (55.0)	59 (98.3)
16	School counsellor role	21 (35.0)	50 (83.3)
17	Available community resources	24 (40.0)	54 (90.0)
18	Confidentiality in seeking help	26 (43.3)	55 (91.7)
19	Importance of early intervention	29 (48.3)	56 (93.3)
20	Peer support groups	23 (38.3)	53 (88.3)

DISCUSSION

This current study demonstrates that the community-based mental health education session produced a substantial positive effect on adolescents' knowledge about depression prevention. Improvements were observed across all 20 assessed knowledge items, particularly in practical coping strategies and help-seeking behaviours. These key findings form the basis for further discussion on the relevance, applicability, and potential scalability of this intervention as a community health promotion effort.

On Table 1, 53.3% fall under 13–15 years of age and are female (60%). It emphasizes that they are girls in early puberty, and they are the most significant group who need special care regarding mental health education. According to Alloy LB et al., adolescent girls are most susceptible to affective disorders due to a change in hormonal status and peer pressure.[19] Also, it is a time for the formation of long-term mental health.[20] In Indonesia, Romadhona N et al. reported that the mild to moderate depression cases among students are in junior high school.[21] The novelty of the current study lies in its focus on a specific age and gender group—girls aged

13–15 years—who are less frequently targeted by prevention interventions at the junior high school level. This group is considered particularly responsive to psychosocial education and more likely to demonstrate meaningful behavioural changes following intervention. These findings suggest that early adolescent girls are more sensitive to psychosocial educational approaches and may undergo substantial behavioural improvements as a result. Therefore, mental health education programs should be initiated at the junior high school level using age- and gender-sensitive strategies. From a practical perspective, educators, nurses, and community nurses can develop group-based interventions that incorporate age and gender considerations into promotive and preventive mental health programs. Before the intervention, 35% of participants were in the low-knowledge category. After the intervention, 85% of the participants moved to the high category. This indicates that educational interventions are very effective in increasing literacy about depression. Ma Karen et al. emphasize that mental health literacy-based school education can change attitudes and improve students' knowledge in a short time.[22] Jorm also emphasizes that the provision of responsive and interactive content can achieve rapid improvement in categories of literacy.[23] On the contrary, Halim et al. show that the application of the visual method of education and group discussion accelerates depression concept understanding in students of junior high school.[24] Knowledge category shift in total after education in one session, which was hardly explained locally before, was assisted in this study. With such a strategy, teenagers can learn and learn comfortably, given that the information is context-provided and interactive. One can teach about depression by contextualizing it in stories, poster contexts, or brief video accounts that are accessible to adolescents. Therefore, the nurses can develop storybook- and vision-oriented educational media that are viable for use in school curricula and in the *Posyandu Remaja* program.

From Table 3, the mean score increases from 11.82 to 16.45 with a p-value of 0.001. This shows the influence of education on students' perception of depression. Thornicroft et al. affirm that brief educational interventions significantly impact mental health awareness when culturally and age-specific.[25] Hasanah et al. also identified a 30% increase in the mean scores of junior high school students after one educational session.[26] Atkin et al. stressed that educational materials must be integrated into school classes to improve education.[27] This study demonstrates a significant increase in knowledge scores following a single educational session, highlighting the effectiveness of instruction tailored to the local context. These findings suggest that greater improvements can be achieved when educational materials and media are designed to align with adolescents' characteristics, interests, and developmental needs. Educational resources may therefore be integrated into existing school-based digital platforms, such as Google Classroom or WhatsApp Groups, even with limited resources. In this context, nurses can contribute by developing e-learning materials or short educational videos as part of school-based health promotion services. Furthermore, as shown in Table 4 (Professional Support, Items 11–18), most adolescents lacked prior knowledge regarding how to manage depressive symptoms or where to seek professional help before receiving the educational intervention. Kirnan et al. argue that school-based help-seeking and coping education are needed to prevent delays in coping.[28] Gao et al. concur that junior high school students who receive coping training demonstrate a high level of improved ability to handle pressure.[29] The Mental Health Foundation in 2021 proposes that coping education and professional advice should be prioritized in school curricula.[30] An additional innovation of this study is the application of per-item analysis to identify specific knowledge domains that are least understood by adolescents, thereby providing clear direction on which components of the educational materials require greater emphasis during implementation. Previous studies indicate that coping strategies and help-seeking behaviours are often perceived as sensitive or taboo topics among adolescents, which may explain their limited emphasis in early educational interventions. Accordingly, the delivery of such interventions should incorporate experiential approaches, such as role-play or simulation, to facilitate practical understanding in realistic settings. In this regard, nurses in educational roles can implement adolescent coping interventions through psychodrama techniques or reflective storytelling methods to enhance engagement and comprehension.

Overall, this study demonstrates that structured mental health education can substantially enhance adolescents' literacy in recognizing and preventing depression. Beyond the observed numerical improvements, these findings reinforce the growing body of evidence that even brief educational interventions can produce meaningful gains in awareness and understanding. Such results are particularly relevant for resource-limited settings, where single-session approaches may offer a practical and scalable strategy to promote adolescent mental health. Educational interventions, even a single session, could be an effective contributor to mental health literacy. This enhanced enhancement further confirms that mental health education interventions must be considered to boost mental health awareness among teenagers.

These findings align with previous studies showing similar effects in mental health education interventions. Swartz et al., sought to determine that psychoeducation enhanced depression knowledge and attitudes among secondary school students significantly, indicating the effectiveness of some interventions at schools and community levels.[30] Similarly, a study paper by Nobre et al. reported that adolescents who had been exposed to focused mental health literacy programs were more likely to recognize signs of depression and seek treatment when they needed it.[31]

Some of the mechanisms that might explain the positive findings obtained remain. It is most likely for adolescents to lack credible information about mental health topics due to stigma, lack of information, and inadequate integration of mental health problems in school programs. It is for this reason that, in presenting information in an adolescent-friendly, informative, and culturally appropriate manner, this intervention was able to bridge the information gap. A study by Blakemore et al. states that early adolescence is a period of development when attitudes and behaviours towards health are formed; hence, education at the right time is highly effective. [32]

In addition, the approach used in this study is social-based education based on social learning theory. Based on this theory, individuals acquire new information and behaviours by observing, interacting, and being reinforced. The interactive nature of the learning sessions, coupled with clear diagrams and peer discussion, will enhance participants' knowledge. This is consistent with a study by Ma KKY, Anderson JK, and Burn AM, which states that interactive strategies in school-based interventions improve the effectiveness of mental health literacy interventions.[22]

One of the recent findings of this study is that a single short educational session delivered in a single 60-minute session is sufficient to improve adolescents' knowledge about preventing depression. Typically, mental health education classes consist of multiple sessions so that students learn in-depth about the subject. The results of this study, however, indicate that even very brief interventions are highly effective and may portend more effective schooling in resource-scarce communities.

These results also imply that cost-efficient community interventions that utilize time effectively can be widely implemented without requiring much in the way of resources and are therefore highly pertinent to implement in a large number of resource-poor communities. In the nursing environment, these conclusions provide a sound basis for incorporating mental health education into health promotion activities for community nurses. Presenting knowledge about the prevention of depression in adolescents is a step that nurses can implement and contribute strongly to fostering proper mental health attitudes from an early age. The above programs could easily be revised and implemented by the nurses at the school or even at the community centre level.

Second, the current study is an essential contribution to studies that consider how mental health education can be integrated into community-based health promotion programmes. This study reinforces a community-based approach in which psychosocial education is provided to adolescents across various levels of society. This also introduces the need for intersectoral collaboration among the health, education, and social sectors to promote the dissemination of information that supports individuals' mental well-being.

Researchers also expect elevating adolescents' awareness of the prevention of depression not only to increase their knowledge but also to transform their attitudes and behaviours in the

long run. One of these hypothesized attitudes and behaviour alterations is an increase in adolescents' help-seeking actions when they face mental illnesses. To test these hypotheses, nevertheless, follow-up studies are necessary. They should conduct follow-up on adolescent behavioural development following the educational intervention over longer periods. Socially, these findings are significant in relation to the general prevalence of mental disorders among adolescents worldwide. According to a WHO report, one in every seven adolescents suffers from a mental disorder, but they are largely undiagnosed and untreated. Local intervention initiatives, such as those in this research, have the capacity to bridge information gaps and contribute to a more mentally resilient younger generation.[33]

While this study indicates encouraging outcomes, certain limitations must be acknowledged. The pre-experimental design, which lacked a control group, makes it difficult to rule out alternative explanations for the observed improvements in knowledge, such as exposure to other information sources, peer discussions, or testing effects. As a result, the certainty of attributing the observed gains exclusively to the intervention is limited. Future studies employing experimental or quasi-experimental designs with control groups may be necessary to provide stronger causal evidence regarding the intervention's effectiveness. Another limitation concerns the brief follow-up interval, which did not allow assessment of whether knowledge gains were sustained over time. Prior studies suggest that long-term behavioural change often requires multiple and reinforced sessions, highlighting the need for more sustained interventions.[34]

Based on the study findings, an important practical implication is integrating mental health education into existing community-based youth activities, such as *Posyandu Remaja*, school-based extracurricular programs, and local youth organizations, to enhance the sustainability and accessibility of mental health promotion initiatives. This approach can be supported through counselling training for local volunteers or health cadres, enabling the dissemination of educational materials cost-effectively and sustainably within the community. In addition, the development of application-based platforms or dedicated websites can facilitate wider access to interactive mental health education resources for adolescents from diverse backgrounds. These strategies should be strengthened through intersectoral partnerships that promote collaboration among the education, social, and health sectors to support comprehensive mental health literacy programs in both school and community settings.

This study is short but has very structured sessions of mental health education that are adequate to bring about an astonishing increase in the degree of adolescents' knowledge of depression prevention. Even though additional studies with improved design are required to determine the long-term stability of such effects, this evidence supports the use of educational models that have the potential to generalize and be widely adopted at low cost. This will help foster the mental well-being of adolescents within diverse populations and enhance the community overall well-being.

CONCLUSION

This study demonstrates that a single, structured, community-based mental health education session grounded in social learning theory can significantly enhance adolescents' knowledge of depression prevention and is both feasible and culturally appropriate for implementation in local settings such as *Posyandu Remaja* (Adolescent Integrated Health Post) and schools. The findings indicate that brief, low-cost educational interventions may serve as a practical and scalable model for promoting adolescent mental health, particularly in resource-limited contexts, and highlight the vital role of nurses and community health workers in integrating such activities into routine community health promotion programs. Nevertheless, future studies employing more robust experimental designs and extended follow-up periods are warranted to evaluate the long-term sustainability of knowledge retention and behavioural change among adolescents.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest related to the research, authorship, and publication of this manuscript. There are no financial arrangements or affiliations with any organization or company that could be perceived as influencing the content of this article.

ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to Rofan Aziz, ST, MT, Director of Politeknik Negeri Indramayu, for his continuous support and encouragement throughout the research process. Deep appreciation is also extended to the Rector of Babcock University, Nigeria, for fostering academic collaboration and providing valuable insights during the conceptual development of this study. The authors also gratefully acknowledge Tutin Marlia, SKM, M. Kes., Head of STIKes Aksari Indramayu, for her institutional support and guidance, which greatly contributed to the successful completion of this study.

DATA AVAILABILITY

The data supporting the findings of this study are not publicly available due to confidentiality and ethical restrictions. However, the datasets are available from the corresponding author upon reasonable request and with permission from the affiliated institutions.

SUPPLEMENTAL DATA

Supplementary materials related to this article, including extended data tables and additional analysis outputs, are available and submitted alongside the manuscript. These materials provide supporting details that complement the core findings but are not essential to the main text. All supplementary files have been prepared clearly and concisely, without tracked changes, highlighted text, or line numbers, and include appropriate captions.

AUTHOR CONTRIBUTIONS

IR conceptualized the study, designed the research framework, and supervised the entire process as the principal investigator. JW was responsible for data collection, preliminary analysis, and contributed to the drafting of the manuscript. MM conducted the statistical analysis, interpreted the results, and participated in the final review and editing of the manuscript. All authors have read and approved the final version of the manuscript.

DECLARATION OF USING AI IN THE WRITING PROCESS

The authors declare that artificial intelligence tools were used only to assist with language refinement and grammatical editing to improve clarity and readability of the manuscript. The use of such tools did not influence the study design, data collection, data analysis, interpretation of results, or the conclusions drawn. All scientific content, interpretations, and conclusions are the full responsibility of the authors.

LIST OF ABBREVIATIONS

SDGs: Sustainable Development Goals; WHO: World Health Organization; UNICEF: United Nations Children's Fund; SPSS: Statistical Package for the Social Sciences; CI: Confidence Interval; p: Probability Value; n: Sample Size; PHC: Primary Health Care; MH: Mental Health; MHP: Mental Health Promotion; EDU: Education; IRB: Institutional Review Board; ID: Identification Number; RE: Research Ethics; PI: Principal Investigator.

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