



Effectiveness of Audiovisual Health Education in Improving Knowledge of Juvenile Delinquency among Midwifery Students

Ahdatul Islamiah¹✉, Tarsikah², Domas Nurchandra Pramudianti¹

¹ Department of Midwifery, Poltekkes Kemenkes Surabaya, Surabaya, East Java, Indonesia

² Basic Sciences Department, Faculty of Health Sciences, Universiti Teknologi Mara, Puncak Alam Campus, 42300, Selangor, Malaysia.

Article Info

Article History:

Received : 30-06-2026

Approved : 08-07-2026

Published : 31-07-2026

Keywords: Audiovisual Education; Adolescent; Juvenile Delinquency; Health Education; Knowledge

Abstract

Background: Juvenile delinquency remains a major public health and social concern that threatens adolescents' physical, psychological, and social well-being. Strengthening adolescents' knowledge through effective educational strategies is therefore essential, and audiovisual media have emerged as a promising approach by integrating visual and auditory learning. **Purpose:** This study aimed to evaluate the effect of audiovisual educational media on knowledge regarding juvenile delinquency among first-year midwifery students at Poltekkes Kemenkes Surabaya. **Methods:** A pre-experimental study with a one-group pretest–posttest design was conducted involving 159 participants selected through purposive sampling. Knowledge was assessed using a structured questionnaire administered before and after an audiovisual educational intervention, and the data were analyzed using descriptive statistics and the Wilcoxon Signed Rank Test with a significance level of 0.05. **Results:** Following the intervention, participants demonstrated a substantial improvement in knowledge, with the proportion of good knowledge increasing markedly and the mean knowledge score rising significantly compared with baseline ($p < 0.001$). These findings indicate that audiovisual educational media are effective in improving knowledge regarding juvenile delinquency among midwifery students. **Conclusion:** Integrating audiovisual learning into midwifery education and adolescent health promotion programs may strengthen future midwives' educational competencies and support more effective juvenile delinquency prevention.

© 2026 Poltekkes Kemenkes Pontianak

✉ Correspondence address:

Department of Midwifery, Poltekkes Kemenkes Surabaya, Surabaya, East Java, Indonesia

Email: mia.ahdatul@poltekkes-surabaya.ac.id

1. INTRODUCTION

Adolescence is also a critical period for establishing lifelong health behaviors and social values. During this developmental stage, adolescents undergo significant biological, cognitive, psychological, and social changes that increase their susceptibility to environmental influences and peer pressure (Santrock & Lansford, 2025). As adolescents gain greater autonomy and interact more frequently with their peers, they are more likely to experiment with behaviors that may place their health and well-being at risk. The World Health Organization (2024) estimates that approximately one-sixth of the world's population consists of adolescents, emphasizing the importance of investing in preventive interventions that promote healthy development and reduce engagement in risky behaviors. Failure to address these issues during adolescence may result in long-term physical, psychological, and social consequences that persist into adulthood (World Health Organization, 2024). Therefore, strengthening character education and social-emotional

competencies is considered an important preventive approach to fostering responsibility, positive values, and healthy social behavior among adolescents ([OECD, 2021](#)).

Juvenile delinquency is a multidimensional phenomenon influenced by interactions among individual, family, school, peer, and community factors. Delinquent behavior among adolescents develops through the complex interplay of individual, family, peer, school, community, and environmental risk factors ([Gupta et al., 2022](#)). According to Bronfenbrenner's Ecological Systems Theory, adolescent behavior is shaped by multiple environmental systems that continuously interact throughout development. Family supervision, peer relationships, school climate, and exposure to digital media collectively influence adolescents' behavioral choices. Schools also play a crucial role in promoting safe, supportive, and inclusive learning environments that protect adolescents from bullying and other forms of violence while fostering their mental health and well-being ([UNICEF, 2022](#)). Consequently, preventive strategies should focus not only on controlling delinquent behaviors but also on strengthening adolescents' knowledge, critical thinking, and decision-making skills through comprehensive health education ([UNICEF, 2021](#)).

The rapid expansion of digital technology has fundamentally transformed educational practices, particularly among adolescents who are considered digital natives. In addition, educational interventions that promote digital literacy and responsible social media use have become increasingly important in preventing cyberbullying and encouraging responsible adolescent behavior in the digital era (Ng et al., 2022). Educational interventions that integrate digital health literacy may enhance adolescents' understanding of health information while encouraging responsible online behavior ([Dadaczynski et al., 2021](#)). Educational videos have become one of the most widely adopted learning media because they present complex information in an attractive, contextual, and interactive format. Compared with text-based learning, audiovisual media stimulate multiple sensory pathways simultaneously, increasing learner engagement and facilitating deeper cognitive processing. Mayer's Cognitive Theory of Multimedia Learning explains that meaningful learning occurs when learners actively integrate verbal explanations with visual representations, thereby improving understanding and long-term retention of information ([R. Mayer, 2021](#)).

Recent evidence has consistently demonstrated the effectiveness of audiovisual media in health education. A systematic review by [Kyaw et al \(2019\)](#) reported that digital and multimedia learning interventions significantly improved knowledge acquisition compared with traditional educational methods among healthcare learners. Similarly, [Theobald \(2023\)](#) emphasized that technology-enhanced learning supports greater learner engagement, promotes self-directed learning, and improves educational outcomes, particularly among university students. These findings indicate that integrating audiovisual media into health education programs may enhance learning effectiveness while accommodating the learning preferences of contemporary students.

Within midwifery education, innovative teaching strategies are increasingly required to prepare graduates capable of addressing complex public health challenges, including adolescent health promotion. The International Confederation of Midwives, (2024) highlights that professional midwives should possess competencies in health education, communication, counseling, and community empowerment. Therefore, strengthening students' knowledge regarding juvenile delinquency through innovative educational approaches is expected to enhance their future professional roles as health educators capable of promoting healthy behaviors among adolescents in schools, families, and communities ([International Confederation of Midwives, 2024](#)).

Despite growing evidence supporting the effectiveness of audiovisual learning, most previous studies have focused on reproductive health education, nutrition, breastfeeding, bullying prevention, or healthy lifestyle promotion. Evidence specifically examining audiovisual education as an intervention to improve knowledge regarding juvenile delinquency among midwifery students remains scarce, particularly in Indonesian higher education settings. This limitation highlights the need for further investigation into innovative educational strategies that may strengthen adolescent health promotion competencies among future midwives.

The findings of this study are expected to provide empirical evidence supporting the integration of audiovisual educational media into adolescent health promotion programs within higher education institutions. Moreover, this study contributes to strengthening evidence-based educational strategies that can improve the competency of future midwives in delivering preventive health education for adolescents. Therefore, this study aimed to analyze the effect of audiovisual educational media on knowledge regarding juvenile delinquency among midwifery students at Poltekkes Kemenkes Surabaya.

2. METHOD

This study employed a pre-experimental design using a one-group pretest-posttest design to evaluate the effectiveness of audiovisual educational media in improving students' knowledge regarding juvenile delinquency. The study was conducted at the Department of Midwifery, Poltekkes Kemenkes Surabaya, Indonesia, between August and October 2024. The study population consisted of all first-year female students enrolled in the Diploma III Midwifery Program and the Applied Bachelor Midwifery Program, totaling 264 students. The minimum sample size was determined using the Slovin formula with a 5% margin of error, resulting in a required sample of 159 respondents. Participants were recruited using purposive sampling based on predetermined inclusion and exclusion criteria. The inclusion criteria were: (1) active first-year midwifery students, (2) willing to participate in the study by signing informed consent, and (3) completing both pretest and posttest questionnaires. Students who were undertaking clinical practice during the data collection period or who did not complete all stages of the intervention were excluded from the study.

The independent variable was audiovisual health education, while the dependent variable was knowledge regarding juvenile delinquency. The intervention consisted of an educational video developed by the research team based on literature regarding adolescent delinquency and health promotion. The video contained information on the definition, forms, risk factors, consequences, and prevention of juvenile delinquency and incorporated narration, animation, visual illustrations, and contextual scenarios reflecting adolescents' daily experiences to enhance learner engagement. Prior to implementation, the educational content was reviewed by experts in midwifery and health education to ensure its relevance, clarity, and appropriateness for the target population.

Knowledge was measured using a structured questionnaire adapted from Prayunika (2016). The instrument consisted of 17 closed-ended questions assessing students' knowledge of juvenile delinquency. Each item was scored on a scale of 0–3, with a maximum score of 3 for each item. The total knowledge score was calculated by summing the scores of all 17 items, resulting in a possible total score ranging from 0 to 51 (17 items $\times$ maximum score of 3). The total scores were categorized into three levels of knowledge: poor, moderate, and good, with higher total scores indicating better knowledge regarding juvenile delinquency. Before data collection, the questionnaire underwent validity and reliability testing. Item validity was assessed using Pearson's product-moment correlation, with all items meeting the predetermined validity criteria. Internal consistency reliability was evaluated using Cronbach's alpha, demonstrating acceptable reliability (Cronbach's $\alpha \geq 0.70$), indicating that the instrument was suitable for measuring respondents' knowledge consistently.

Data collection was conducted in three consecutive stages. First, respondents completed the pretest questionnaire to assess baseline knowledge. Next, participants attended a classroom-based educational session in which the audiovisual intervention was delivered simultaneously. Immediately after completing the pretest, participants watched a 10-minute educational video on juvenile delinquency once using their personal smartphones connected to the institution's stable internet network. The research team supervised the session to ensure that all participants watched the complete video under comparable conditions without interruption. A brief clarification session was provided after the video if participants had questions regarding the educational content. The posttest was administered immediately after completion of the educational session using the same questionnaire as the pretest. Thus, the posttest assessed immediate changes in participants' knowledge following the audiovisual intervention rather than long-term knowledge retention.

Data were analyzed using IBM SPSS Statistics. Descriptive statistics were used to summarize respondents' characteristics and knowledge levels before and after the intervention. Continuous variables were presented as means and standard deviations, whereas categorical variables were expressed as frequencies and percentages. Data normality was assessed before inferential analysis. The normality of the pretest and posttest knowledge scores was assessed using the Kolmogorov–Smirnov test in SPSS. The results indicated that the data were not normally distributed ($p < 0.05$). Therefore, differences between pretest and posttest knowledge scores were analyzed using the Wilcoxon Signed Rank Test, with statistical significance set at $p < 0.05$.

This study was conducted in accordance with the ethical principles of research involving human participants, including respect for autonomy, beneficence, non-maleficence, justice, confidentiality, and anonymity. Ethical approval for this study was obtained from the Health Research Ethics Committee of Poltekkes Kemenkes Surabaya prior to data collection. Written informed consent was obtained from all participants before their enrollment in the study. Participation was voluntary, and respondents were informed of their right to withdraw from the study at any time without any academic consequences.

3. RESULTS AND DISCUSSION

Results

1) Respondent Characteristics

Table 1. Characteristics of Respondents (n = 159)

Characteristics	n	%
Age (years)		
18	55	34.5
19	52	32.7
20	52	32.7
Sex		
Female	159	100.0

A total of 159 first-year midwifery students participated in this study. The respondents were exclusively female because the study population consisted of students enrolled in the Midwifery Diploma and Applied Bachelor programs at Poltekkes Kemenkes Surabaya. Most respondents were 18 years old (34.5%), while the remaining respondents were aged 19 years (32.7%) and 20 years (32.7%).

The relatively homogeneous age distribution indicates that respondents were in late adolescence, a developmental period characterized by emotional instability, identity exploration, and increased susceptibility to peer influence. Consequently, this age group is considered highly appropriate for preventive educational interventions addressing juvenile delinquency.

2) Changes in Knowledge Before and After Audiovisual Education

The distribution of respondents' knowledge before and after receiving audiovisual education is presented in Table 2.

Table 2. Distribution of Knowledge Levels Before and After Audiovisual Education

Knowledge Level	Pretest n (%)	Posttest n (%)
Good	4 (2.5)	151 (94.9)
Moderate	20 (12.6)	3 (1.9)
Poor	135 (84.9)	5 (3.2)
Total	159 (100)	159 (100)

Before the intervention, most respondents (84.9%) demonstrated poor knowledge regarding juvenile delinquency. Only 2.5% had good knowledge. Following the audiovisual educational intervention, the proportion of respondents with good knowledge increased markedly to 94.9%, while those categorized as having poor knowledge decreased substantially to 3.2%.

These findings indicate that audiovisual education successfully improved respondents' understanding of juvenile delinquency and its prevention.

3) Effect of Audiovisual Education on Knowledge

To evaluate the effectiveness of the audiovisual educational intervention, pretest and posttest knowledge scores were compared using the Wilcoxon Signed Rank Test because the data were not normally distributed.

Table 3. Comparison of Knowledge Scores Before and After Audiovisual Education

Variable	Median	Mean $\pm$ SD	Min–Max	p-value
Pretest	23	24.09 $\pm$ 6.31	17–42	
Posttest	51	48.92 $\pm$ 5.16	22–51	<0.001

Wilcoxon Signed Rank Test

The median knowledge score increased from 23 at pretest to 51 at posttest. The mean knowledge score also increased from 24.09 $\pm$ 6.31 to 48.92 $\pm$ 5.16 following the intervention. The Wilcoxon Signed Rank Test showed a statistically significant difference between pretest and posttest knowledge scores ($p < 0.001$), indicating a significant improvement in students' knowledge of juvenile delinquency following the audiovisual educational intervention.

Discussion

This study demonstrated that audiovisual educational media significantly improved knowledge regarding juvenile delinquency among first-year midwifery students. Following the educational intervention, the proportion of respondents with good knowledge increased substantially from 2.5% before the intervention to 94.9% after the intervention, while the proportion of respondents with poor knowledge decreased from 84.9% to 3.2%. Furthermore, the mean knowledge score increased from 24.09 ± 6.31 to 48.92 ± 5.16 , with the Wilcoxon Signed Rank Test indicating a statistically significant difference ($p < 0.001$). These findings suggest that audiovisual education is highly effective in improving adolescents' cognitive understanding of juvenile delinquency.

Knowledge is recognized as the foundation for behavioral change. According to Notoatmodjo (2021), health education aims not only to increase knowledge but also to facilitate positive attitudes and healthy behavioral changes through effective communication strategies. Individuals who receive accurate and understandable health information are more likely to adopt positive health behaviors. In the present study, the educational video integrated narration, animation, visual illustrations, and contextual examples, which may have facilitated respondents' understanding of juvenile delinquency and contributed to the observed improvement in their knowledge (Notoatmodjo, 2021). This finding is also consistent with the Theory of Planned Behavior, which proposes that behavioral intentions are influenced by attitudes toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 2020). Therefore, improving knowledge through audiovisual education may strengthen students' intentions to adopt and promote preventive behaviors related to juvenile delinquency.

The effectiveness of audiovisual education can also be explained through Mayer's Cognitive Theory of Multimedia Learning, which states that learning becomes more effective when information is presented simultaneously through visual and auditory channels. The integration of moving images, narration, and contextual scenarios reduces cognitive load, increases learner attention, facilitates information processing, and enhances long-term memory retention (Mayer, 2021). This theoretical framework supports the substantial improvement observed in respondents' knowledge scores following the intervention.

The present findings are also supported by previous studies highlighting the potential of video-based educational media in addressing adolescent social issues. (Morgado et al., 2024) Recent evidence has demonstrated that video-based educational interventions significantly improve learner engagement, knowledge acquisition, skills development, and attitudes, indicating that audiovisual learning media represent an effective educational strategy in health education. These findings further reinforce the potential of audiovisual education as an effective strategy for improving adolescents' knowledge.

The present study has several strengths. First, it focused specifically on juvenile delinquency, a topic that has received relatively limited attention within midwifery education despite its importance for adolescent health promotion. Second, the intervention utilized contextual audiovisual media designed to reflect situations commonly experienced by adolescents, thereby increasing the relevance of educational messages. Third, the study involved a relatively large sample of first-year midwifery students, providing useful preliminary evidence regarding the effectiveness of audiovisual educational interventions in higher education settings. These strengths contribute to the growing body of evidence supporting innovative educational strategies for adolescent health promotion.

The findings of this study are consistent with recent evidence demonstrating that audiovisual media effectively improve adolescents' health knowledge. A systematic review conducted by Herlina & Putri (2023) concluded that video-based health education significantly improves knowledge acquisition, learning motivation, and information retention among adolescents compared with traditional lecture-based education. Similarly, (Arif P & Wardaningsih, 2023) reported that audiovisual interventions effectively improved adolescents' mental health knowledge by facilitating better understanding and more effective delivery of educational messages through combined visual and auditory stimuli.

The effectiveness of audiovisual education is also closely related to the characteristics of today's adolescents, who are highly familiar with digital technology and multimedia learning environments. Digital educational media provide a more attractive, interactive, and flexible learning experience, allowing learners to process information more efficiently than text-based educational approaches. Consequently, integrating audiovisual learning into adolescent health promotion programs may substantially improve educational outcomes and increase adolescents' willingness to participate in health education activities ([World Health Organization, 2024](#)).

Another important finding of this study is the potential contribution of audiovisual education to strengthening the educational role of future midwives. Midwives are expected not only to provide reproductive healthcare but also to function as educators, counselors, and advocates for adolescent health. Adequate knowledge regarding juvenile delinquency enables future midwives to deliver preventive health education within schools, communities, and primary healthcare settings. Therefore, incorporating innovative educational media into midwifery curricula may improve students' educational competencies and support national adolescent health promotion programs.

The novelty of this study lies in the implementation of an audiovisual educational intervention specifically addressing juvenile delinquency among first-year midwifery students. Previous Indonesian studies have predominantly focused on audiovisual education for reproductive health, bullying prevention, nutrition, or substance abuse separately. In contrast, this study comprehensively addressed juvenile delinquency by integrating information regarding its definition, forms, risk factors, consequences, and preventive strategies into a single educational video. Consequently, this study provides additional empirical evidence supporting the use of audiovisual media as an innovative learning strategy within midwifery education.

Several limitations should be acknowledged. First, this study employed a one-group pretest–posttest design without a comparison group, limiting the ability to establish causal relationships. Second, respondents were recruited from a single educational institution; therefore, the findings may not be generalizable to other adolescent populations. Third, knowledge was assessed immediately after the intervention, making it impossible to determine long-term knowledge retention or subsequent behavioral changes. Future studies should employ randomized controlled trials involving larger and more diverse populations and include follow-up assessments to evaluate the sustainability of audiovisual educational interventions on adolescents' knowledge, attitudes, and behaviors.

The implications of this study extend beyond improving students' knowledge. Future midwives play an essential role in promoting adolescent health through education, counseling, and community engagement. Strengthening their understanding of juvenile delinquency during undergraduate education may improve their readiness to identify adolescents at risk, deliver preventive counseling, and collaborate with schools, families, and community organizations in reducing juvenile delinquency. Thus, integrating audiovisual educational media into the midwifery curriculum may contribute not only to improving academic learning outcomes but also to strengthening professional competencies required in community-based midwifery practice ([International Confederation of Midwives, 2024](#)).

The substantial improvement in knowledge observed in this study may also be explained by the Cone of Experience proposed by Dale, which suggests that learning becomes more meaningful when learners receive information through multiple sensory modalities rather than through verbal instruction alone. Audiovisual media engage both visual and auditory senses simultaneously, enabling learners to process information more actively, construct meaningful understanding, and retain knowledge for a longer period. Compared with passive learning approaches, educational videos create contextual learning experiences that increase learners' motivation and facilitate the transfer of knowledge into future practice ([Mayer, 2021](#)).

Another possible explanation for the positive findings is the relevance of the educational content to respondents' daily experiences. The educational video presented real-life situations involving bullying, substance abuse, peer pressure, violence, and risky behaviors that are commonly encountered during adolescence. Contextual learning has been shown to improve learners' ability to connect theoretical concepts with practical situations, thereby strengthening cognitive engagement and improving knowledge acquisition ([Kolb, 2015](#)). This contextual approach may explain why respondents demonstrated substantial improvements in their post-intervention knowledge scores.

The present findings are also supported by broader evidence demonstrating that digital health education has become an increasingly effective strategy for improving health literacy among adolescents and young adults. The rapid advancement of digital technology has transformed learning preferences, with contemporary students showing greater interest in interactive and technology-assisted educational approaches than in conventional lecture-based instruction. According to the ([World Health Organization, 2024](#)), digital health interventions offer significant opportunities to improve access to health information, promote preventive behaviors, and strengthen adolescent health literacy. Therefore, integrating audiovisual

education into health promotion programs is consistent with current recommendations for adolescent-centered health education.

From an educational perspective, the implementation of audiovisual learning also aligns with principles of student-centered learning, which emphasize active participation, self-directed learning, and learner engagement. Educational videos encourage students to observe, analyze, and reflect upon real-life situations rather than merely receiving information passively. Such approaches have been associated with greater learning satisfaction, improved critical thinking skills, and enhanced knowledge retention among healthcare students (Theobald, 2023). Consequently, audiovisual education represents an appropriate instructional strategy for preparing future midwives to address increasingly complex adolescent health problems.

4. CONCLUSION

This study demonstrated that audiovisual educational media significantly improved knowledge regarding juvenile delinquency among first-year midwifery students at Poltekkes Kemenkes Surabaya. Following the educational intervention, respondents showed a substantial increase in knowledge scores, indicating that video-based health education is an effective approach for enhancing adolescents' understanding of juvenile delinquency and its prevention. The integration of visual and auditory learning elements enables information to be delivered in a more engaging, comprehensible, and memorable manner, thereby facilitating meaningful learning outcomes.

The findings of this study provide empirical evidence supporting the use of audiovisual educational media as an innovative strategy for adolescent health promotion within midwifery education. Incorporating audiovisual learning into educational and community-based health promotion programs may strengthen preventive efforts against juvenile delinquency while enhancing the educational role of future midwives. Further studies employing randomized controlled designs, larger and more diverse populations, and longer follow-up periods are recommended to evaluate the long-term impact of audiovisual education on knowledge retention, attitude formation, and behavioral change among adolescents.

5. ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to the Director of Poltekkes Kemenkes Surabaya, the Head of the Department of Midwifery, and the Center for Research and Community Service (PPM) of Poltekkes Kemenkes Surabaya for their administrative support throughout this study. The authors also sincerely thank all first-year midwifery students who voluntarily participated in this research and contributed to the successful completion of this study.

REFERENCE

- Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies*, 2(4), 314–324. <https://doi.org/10.1002/hbe2.195>
- Arif P, S., & Wardaningsih, S. (2023). Effectiveness of audiovisual media to improve mental health knowledge for adolescents: A systematic review. *Jurnal Aisyah: Jurnal Ilmu Kesehatan*, 8(2). <https://doi.org/10.30604/jika.v8i2.2012>
- Dadaczynski, K., Okan, O., Messer, M., Leung, A. Y. M., Rosário, R., Darlington, E., & Rathmann, K. (2021). Digital Health Literacy and Web-Based Information-Seeking Behaviors of University Students in Germany During the COVID-19 Pandemic: Cross-sectional Survey Study. *Journal of Medical Internet Research*, 23(1), e24097. <https://doi.org/10.2196/24097>
- Gupta, M. K., Mohapatra, S., & Mahanta, P. K. (2022). Juvenile's Delinquent Behavior, Risk Factors, and Quantitative Assessment Approach: A Systematic Review. *Indian Journal of Community Medicine*, 47(4), 483–490. https://doi.org/10.4103/ijcm.ijcm_1061_21
- Herlina, S. , & Putri, R. A. (2023). The effectiveness of audiovisual health education on adolescents' knowledge: A systematic review. *Journal of Health Promotion*, 11(2), 115–123.
- International Confederation of Midwives. (2024). *Essential Competencies for Midwifery Practice*.
- Kolb, D. A. (2015). *Experiential Learning: Experience as the Source of Learning and Development* (2nd ed.). Pearson Education.
- Kyaw, B. M., Saxena, N., Posadzki, P., Vseteckova, J., Nikolaou, C. K., George, P. P., Divakar, U., Masiello, I., Kononowicz, A. A., Zary, N., & Tudor Car, L. (2019). Virtual Reality for Health Professions Education: Systematic Review and Meta-Analysis by the Digital Health Education Collaboration. *Journal of Medical Internet Research*, 21(1), e12959. <https://doi.org/10.2196/12959>
- Mayer, R. (2021). *The Cambridge Handbook of Multimedia Learning* (R. E. Mayer & L. Fiorella, Eds.). Cambridge University Press. <https://doi.org/10.1017/9781108894333>
- Morgado, M., Botelho, J., Machado, V., Mendes, J. J., Adesope, O., & Proença, L. (2024). Video-based

- approaches in health education: a systematic review and meta-analysis. *Scientific Reports*, 14(1), 23651. <https://doi.org/10.1038/s41598-024-73671-7>
- Notoatmodjo, S. (2021). *Promosi Kesehatan dan Perilaku Kesehatan (Revisi)* (Rineka Cipta, Ed.).
- OECD. (2021). *Beyond Academic Learning: First Results from the Survey of Social and Emotional Skills*, OECD Publishing, Paris. OECD. <https://doi.org/10.1787/92a11084-en>
- Santrock, J. W. ., & Lansford, J. E. . (2025). *Adolescence*. McGraw Hill LLC.
- Theobald, E. J. , et al. (2023). *Active and technology-enhanced learning in higher education: Current evidence and future directions*. (Nature Reviews Psychology, Ed.; Vol. 2, pp. 403–416).
- UNICEF. (2021). *The State of the World's Children 2021: On My Mind—Promoting, Protecting and Caring for Children's Mental Health*.
- UNICEF. (2022). *State of the world's children 2021 : on my mind promoting, protecting and caring for children's mental health*. UNICEF. <https://www.unicef.org/media/114636/file/SOWC-2021-full-report-English.pdf>
- World Health Organization. (2024). *Adolescent health*. Geneva: World Health Organization.