

## Improving adolescent knowledge on early marriage through school-based education



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### ABSTRACT

Early marriage remains a prevalent issue in Indonesia, particularly in rural areas such as Cibalong District, Tasikmalaya. Despite national efforts, the lack of structured, school-based reproductive health education contributes to persistent high rates of underage marriage. This study aims to evaluate the effectiveness of educational intervention on adolescents' knowledge regarding early marriage. A pre-experimental study using a one-group pretest-posttest design was conducted from October to November 2024 at SMPN 1 Cibalong, Tasikmalaya, Indonesia. A total of 132 Grade IX students were selected using purposive sampling. The intervention consisted of a 60-minute school-based educational session focusing on the definition, causes, risks, impacts, and prevention of early marriage, delivered through multimedia presentations and group discussion. Knowledge was assessed using a validated 20-item questionnaire before and one week after the intervention. Data were analyzed using Wilcoxon signed-rank test with a significance level of  $p < 0.05$ . Prior to the intervention, 38.64% of students had low knowledge levels, 29.55% moderate, and 31.82% high. Post-intervention, 87.12% had high knowledge, 12.88% moderate, and none remained in the low category. Statistically significant improvements were observed across all six indicators of early marriage knowledge, including understanding, causes, risk, prevention, impact, and contributing factors ( $p = 0.000$ ). The findings confirm that targeted, school-based reproductive health education effectively improves adolescents' knowledge and awareness about early marriage. This low-cost, scalable approach can be integrated into school curricula and may serve as a preventive strategy against early marriage in high-risk areas.

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### INTRODUCTION

Early marriage remains a serious global public health and social issue, particularly in developing countries.(1) According to the United Nations Department of Economic and Social Affairs (UNDESA), Indonesia ranks 37th out of 158 countries with a high prevalence of early marriage, where approximately 34% of women are married before the age of 18. This places Indonesia as the second highest among ASEAN countries, following Cambodia.

At the national level, early marriage in Indonesia continues to be widespread despite legal reforms.(2) Based on data from the Statistics Indonesia (*Badan Pusat Statistik/ BPS*) in 2022, the proportion of marriages among individuals aged 19–21 years was 33.76%, while those aged 16–18 years accounted for 19.24%, and 2.26% were married before the age of 15. Furthermore, data from the National Population and Family Planning Board (BKKBN) showed that in 2018, 1 in 9 girls (approximately 11.21%) were married before turning 18.(3) In response to this concern, Law Number 16 of 2019 amended the previous Marriage Law (Law No. 1 of 1974), setting the minimum legal age for marriage for both men and women at 19 years. Regionally, West Java continues to report one of the highest rates of early marriage in Indonesia.(4) According to the West Java Provincial Government, in 2022, approximately 8.65% of couples in the province entered marriage at an early age. This figure reflects the persistent cultural and socioeconomic factors influencing adolescent decision-making regarding marriage in the region.

Adolescents who marry at an early age face a multitude of serious health risks that extend well beyond the immediate physical consequences. Among the most significant are obstetric complications due to biological immaturity including obstructed labor, obstetric fistula, preterm birth, low birth weight, and maternal mortality which are disproportionately higher among girls married before age 18.(5) For instance, girls under 15 years are up to five times more likely to die during childbirth compared to women aged 20–24 years, and adolescents aged 15–19 face twice the mortality risk relative to those in their twenties.(6) Moreover, adolescent brides often experience repeated pregnancies with little spacing, which increases the risk of anemia, postpartum hemorrhage, abortion, and intrauterine growth restriction.(7) A multi-country analysis in South Asia revealed strong associations between early marriage and poor fertility control, high rates of rapid repeat childbirth, unintended pregnancy, and limited access to antenatal care and skilled delivery services.(8) Psychological and social impacts are also profound. A recent cohort study in India documented that girl who married early reported significantly worse mental health outcomes including depression, suicidal ideation, and increased vulnerability to intimate partner violence compared to their unmarried peers, even after adjusting for baseline mental health status.(9) Additionally, early marriage often results in social isolation, educational disruption, and economic dependency. Women married as adolescents are more likely to drop out of school, lack autonomy in household decision-making, and suffer from reduced voice and status within their households and communities. Finally, early marriage significantly heightens exposure to gender-based violence. Girls married before 15 are nearly 50% more likely to experience intimate partner violence than those who marry later, contributing to both physical harm and long-term psychological trauma.(10)

Existing research highlights multiple determinants contributing to early marriage, including low socioeconomic status, limited knowledge, cultural norms, and media exposure with economic hardship identified as the most dominant factor. However, while economic interventions such as conditional cash transfers can delay marriage, their effects are often not sustained once financial support ends, and they do not necessarily improve adolescent knowledge or empowerment.(11) Despite legal reforms raising the minimum marriage age, early marriage remains prevalent in many Indonesian communities, particularly in rural areas like Cibalong. A preliminary survey in Cibalong District revealed no existing school-based program or formal education addressing early marriage or reproductive health among adolescents. Between 2022 and mid-2024, the proportion of couples married under 19 in the area remained above 11%, and a striking share of these youth were alumni from SMPN 1 Cibalong. Interviews with 20 former students indicated that most married voluntarily post-junior high, lacking awareness of associated risks.

The absence of structured education on early marriage represents a critical gap. Education-based interventions particularly school-based reproductive health programs

have consistently shown greater effectiveness in improving adolescent knowledge and attitudes and have stronger long-term sustainability compared to strictly legal, financial, or community dialogue interventions. A study in Indonesia demonstrated that reproductive health education delivered through community engagement significantly increased knowledge and marriage readiness among adolescents.(12) Likewise, a national systematic review recommended the full integration of comprehensive sexuality education (CSE) into school curricula to improve adolescent knowledge, self-efficacy, and delay harmful behaviors including early marriage highlighting its cost-effectiveness and policy feasibility. International evidence further supports this.(13) A randomized trial in Ghana using health-belief-model-based education found significant increases in knowledge and self-efficacy related to adolescent pregnancy prevention even without financial incentives indicating that knowledge empowerment itself is a potent intervention.(14) A multi-country systematic review in sub-Saharan Africa similarly found that stand-alone education interventions outperformed combined economic or social norm strategies in improving adolescent outcomes, particularly when delivered through schools or youth groups.(15) Given that schools provide broad access to adolescents in critical developmental stages, and educational interventions can be integrated into existing curricula at relatively low cost, they offer a logical, logically feasible, and scalable approach. They avoid the temporary nature of cash-based programs and the complexity of changing deep-rooted cultural norms alone.

In the specific context of SMPN 1 Cibalang, no formal educational program addressing early marriage has been implemented, and thus adolescent knowledge remains low. An intervention based on school-based reproductive health education appears to be a promising and sustainable strategy to improve awareness, shift attitudes, and ultimately contribute to reducing early marriage rates in this community. This study aims to generate evidence that supports **educational intervention as a key** strategy for reducing early marriage by enhancing adolescent awareness and decision-making capacity, and to advocate for the integration of CRHE into the junior high school curriculum across similar high-prevalence areas in Indonesia.

## METHOD

This study employed a quantitative approach with a one-group pretest-posttest design, a type of pre-experimental research in which a single group is measured before and after an educational intervention, without a control group. The study was conducted from October to November 2024 at Public Junior High School (SMPN) 1 Cibalang, located at Jl. Karangnunggal No. 7, Cibalang Village, Tasikmalaya Regency, West Java, Indonesia. Participants were selected using purposive sampling, targeting Grade IX students. The inclusion criteria were: (1) currently enrolled in Grade IX at SMPN 1 Cibalang, (2) aged between 14 and 16 years, and (3) willing to participate with informed consent from both student and parent/guardian. Exclusion criteria included students who were absent during either the intervention or data collection sessions, or those with cognitive impairments affecting participation. The educational intervention focused on early marriage and its health, psychological, and social consequences. It was designed as part of a school-based reproductive health education program, aiming to equip adolescents with accurate knowledge and critical thinking skills regarding early marriage. The intervention was delivered in a structured 60-minute session by a trained health educator. The session included a PowerPoint presentation, educational video screenings, and facilitated group discussions to encourage active participation and reflection. Content was adapted from nationally endorsed reproductive health modules developed by the National Population and Family Planning Agency (BKKBN) and aligned with the WHO guidelines for adolescent health education. As a school-based intervention, the program was integrated within the

students' regular extracurricular schedule, allowing for sustainability and minimizing disruption to academic learning. Emphasis was placed on interactive learning, culturally sensitive messaging, and promoting gender-equitable attitudes. The educational materials covered four core areas: (1) definitions and misconceptions about early marriage, (2) physical and reproductive health risks, (3) psychosocial and economic consequences, and (4) legal regulations concerning the age of marriage in Indonesia. Knowledge was measured using a validated structured questionnaire consisting of 20 multiple-choice questions covering understanding, factors, risks, prevention, impact, and causes of early marriage. Each correct answer was scored as 1 point, with a total score range of 0–20. The instrument underwent content validation by three public health experts and demonstrated good internal consistency (Cronbach's alpha = 0.82). A pretest was administered one day prior to the intervention, and a posttest was conducted one week after the session. Quantitative data were analyzed using SPSS version 28. Descriptive statistics were used to summarize participants' characteristics and knowledge scores. A paired sample t-test or Wilcoxon test was employed to compare pretest and posttest knowledge scores. Statistical significance was set at  $p < 0.05$ .

## RESULTS

Table 1 presents the Prior to the educational intervention, most adolescents demonstrated low levels of knowledge about early marriage. Specifically, 51 respondents (38.64%) were categorized as having low knowledge, while only 42 respondents (31.82%) had high knowledge. After being given school-based education, the majority of respondents (115 adolescents, 87.12%) achieved high knowledge levels, and none remained in the low category. The Wilcoxon signed-rank test indicated a statistically significant difference between pretest and posttest results ( $Z = -8.34$ ,  $p < 0.001$ ), confirming that the educational intervention effectively improved adolescents' knowledge.

Table 1. Comparison of Adolescents' Knowledge Levels Before and After Educational Intervention (n = 132)

Knowledge Level	Pretest f (%)	Posttest f (%)	Z	p-value
High	42 (31.82)	115 (87.12)		
Moderate	39 (29.55)	17 (12.88)		
Low	51 (38.64)	0 (0.00)		
Total	132 (100)	132 (100)	-8.34	< 0.001

These findings demonstrate a clear and significant shift from low to high knowledge after the intervention, suggesting that school-based education is an effective medium for improving awareness of early marriage among adolescents.

Further analysis of knowledge indicators revealed improvements across all six domains assessed. Before the intervention, the lowest level of knowledge was found in the "Factors of Early Marriage" indicator (only 11 respondents [8.3%] scored high), while the highest was in the "Causes of Early Marriage" indicator (81 respondents [61.4%] scored high). After the educational session, all indicators showed substantial increases, particularly in the "Risk of Early Marriage" (from 75 to 116 respondents with high scores) and "Prevention of Early Marriage" (from 60 to 98 respondents with high scores).

Table 2. Comparison of Pretest and Posttest Knowledge Indicators on Early Marriage (n = 132)

Indicator	High (Pre)	High (Post)	Moderate (Pre)	Moderate (Post)	Low (Pre)	Low (Post)
Understanding of Early Marriage	37	90	40	33	55	9
Factors of Early Marriage	11	52	29	59	92	21
Risks of Early Marriage	75	116	0	0	57	16
Prevention of Early Marriage	60	98	28	27	44	7
Impact of Early Marriage	22	68	41	48	69	16
Causes of Early Marriage	81	114	0	0	51	18

The post-intervention increase across all knowledge indicators suggests that the educational content not only improved general awareness but also strengthened specific cognitive domains related to understanding, risk perception, and preventive actions toward early marriage. The post-intervention increase across all knowledge indicators suggests that the educational content not only improved general awareness but also strengthened specific cognitive domains related to understanding, risk perception, and preventive actions toward early marriage.

## DISCUSSION

This study addresses a critical public health and social issue by focusing on early marriage prevention through education among adolescents in a high-risk region. Despite numerous national campaigns and legal frameworks aimed at reducing child marriage, the persistence of high prevalence rates particularly in rural areas of West Java underscores the limited effectiveness of macro-level interventions in reaching school-aged adolescents. The novelty of this research lies in its targeted, school-based reproductive health education module that directly engages junior high school students through an integrated, participatory approach. Unlike many previous studies that focus on demographic determinants or rely solely on knowledge assessment post-intervention, this study adopts a pretest-posttest design to demonstrate measurable shifts in knowledge following a structured, evidence-based intervention. Unlike previous studies that generally assess knowledge as a single construct, this research disaggregates knowledge into six core indicators: understanding, causes, risk, impact, prevention, and contributing factors of early marriage. Such granular analysis allows for a nuanced understanding of which aspects of knowledge are most responsive to educational input.

Importantly, the intervention leverages locally relevant content adapted from national health guidelines and the WHO framework, delivered in an accessible format via multimedia tools and facilitated discussions. This makes the intervention not only replicable but also scalable within formal education systems. The results offer compelling evidence that integrating comprehensive reproductive health education specifically tailored to address early marriage into junior secondary curricula may be a feasible and cost-effective strategy for increasing awareness and altering perceptions at a critical developmental stage.

The findings reveal a substantial improvement in adolescent knowledge regarding early marriage following the educational intervention. Before the intervention, most students exhibited low (38.64%) to moderate (29.55%) levels of knowledge, with only 31.82% classified as having high knowledge. Post-intervention data demonstrated a dramatic shift, with 87.12% of participants achieving high knowledge levels and no students remaining in the low category. This improvement is statistically significant, as indicated by the Wilcoxon test ( $p$ -value = 0.000), confirming the effectiveness of the educational session in increasing

students' understanding of the risks and implications of early marriage. These results suggest that targeted educational sessions can significantly enhance adolescent awareness, even within a short intervention period. The elimination of the low-knowledge category entirely post-intervention further highlights the potential of structured health education as a primary preventive tool. By equipping students with accurate information, this approach may empower them to make informed life decisions and resist social or familial pressures related to early marriage.

The study demonstrated significant improvements in students' knowledge across all six indicators following the educational intervention: (1) Understanding of Early Marriage: Pre-intervention data showed that only 37 students had a high level of understanding, increasing to 90 post-interventions. The number of students with low understanding decreased dramatically from 55 to only 9. The intervention was successful in clarifying the concept of early marriage, likely due to the clarity of definitions presented in multimedia and discussion sessions; (2) Factors Contributing to Early Marriage: Before the intervention, only 11 students scored in the high category, while 92 were in the low category. Post-intervention, 52 students reached high-level knowledge, and only 21 remained in the low category. This marked improvement indicates enhanced awareness of socio-economic and cultural drivers of early marriage; (3) Risks of Early Marriage: There was a notable shift from 75 high and 57 low scorers' pre-intervention to 116 high scorers and only 16 low scorers' post-intervention. Risk-related information, particularly health consequences, was well internalized, possibly due to its direct relevance and emotional impact. (4) Prevention Strategies: Pre-intervention data showed 60 students with high knowledge, increasing to 98 after the intervention. The number of students in the low category dropped from 44 to 7. Exposure to prevention strategies such as delaying marriage through education and accessing support services was effectively communicated. (5) Impacts of Early Marriage: High knowledge scores increased from 22 to 68 students, and low scores dropped from 69 to 16. The intervention successfully highlighted negative consequences such as school dropout, reproductive complications, and emotional stress. (6) Causes of Early Marriage: Students with high knowledge rose from 81 to 114, and low scorers decreased from 51 to 18. A better understanding of root causes including family pressure, economic hardship, and lack of awareness was established. Overall, the intervention resulted in significant improvements across all indicators, with the most notable gains seen in the areas of factors, impact, and prevention of early marriage. This outcome demonstrates that a single-session, well-structured educational program can effectively enhance multidimensional knowledge in adolescents and potentially influence their future attitudes and behaviours regarding marriage decisions.

The results of this study demonstrated a significant improvement in adolescents' knowledge regarding early marriage following an educational intervention. These findings are consistent with previous studies conducted both nationally and internationally. A study by Ririnisahawaitun et al. in North Sumatra, Indonesia, found a significant increase in adolescent knowledge scores after a single-session counseling on early marriage, with the average score rising from 15.10 to 31.90 ( $p < 0.001$ ), supporting the notion that structured educational sessions can effectively improve adolescent understanding of early marriage and its consequences.(16) These findings are consistent with our results, namely a sharp increase in the "high" knowledge category and a loss in the "low" category, strengthening the evidence of the effectiveness of educational sector interventions on adolescents' understanding of early marriage. Similarly, a large-scale study by Fitria et al. using national data from Indonesia revealed that adolescents with lower education levels were significantly more likely to experience early marriage. Those with only junior high school education were 146 times more likely to marry early than peers with tertiary education, highlighting the critical role of formal education and informed awareness in preventing early marriage.(17)

This supports our study's emphasis on the importance of education as a preventive tool; your research findings confirm that education (through intervention) can directly increase adolescent awareness.

International studies provide further validation. A systematic review of interventions in sub-Saharan Africa reported that stand-alone education programs were among the most effective strategies for increasing adolescent knowledge and delaying early marriage, compared to interventions based solely on economic support or social norm transformation.(15) Additionally, an experimental study in Tehran, Iran showed that adolescent girls who received health education sessions grounded in the Health Belief Model exhibited significantly improved knowledge and perception regarding the risks of early marriage, even without any financial incentives.(18) These studies align with the present research, particularly in the observed increases across knowledge indicators such as understanding, causes, risks, and prevention of early marriage. Collectively, the alignment between the current findings and previous literature strengthens the validity of school-based reproductive health education as a viable and effective approach to enhancing adolescents' knowledge. It also emphasizes the importance of integrating comprehensive, evidence-based reproductive health curricula within school systems to support national and global efforts to reduce early marriage prevalence.

The findings of this study demonstrate that targeted educational interventions on early marriage significantly enhance adolescents' knowledge across multiple dimensions including understanding, causes, risks, impacts, and prevention strategies. The shift in knowledge level from 38.64% in the low category pre-intervention to 87.12% in the high category post-intervention confirms the substantial cognitive gains resulting from the single-session educational approach. This improvement underscores the crucial role of school-based, reproductive health-focused education in addressing misinformation and knowledge gaps regarding early marriage among adolescents. Prior research supports that adolescents are highly receptive to structured, age-appropriate educational content, particularly when it integrates multimedia tools and participatory learning methods such as discussions and real-life case studies.(19) Moreover, the significant gain in knowledge across all six questionnaire indicators reinforces the importance of comprehensive, rather than fragmented, education on early marriage. Scientifically, the results of this study contribute to growing evidence that health education interventions especially those integrated into formal education systems can serve as a protective factor against early marriage, which is associated with increased maternal morbidity, higher rates of school dropout, early pregnancy, and poor socio-economic outcomes.(20) By empowering students with accurate knowledge and critical thinking regarding early marriage, education can enhance individual agency and delay early union decisions. Additionally, this study highlights the cognitive readiness of adolescents aged 14–16 years to engage with sensitive issues when delivered in a respectful and developmentally appropriate manner. This aligns with the framework proposed by the WHO, which emphasizes the delivery of comprehensive sexuality education (CSE) that is rights-based, scientifically accurate, and tailored to adolescents' developmental stages to reduce health risks and promote autonomy.(21) The scientific meaning of these results also lies in the reinforcement of educational strategies as public health interventions. When contextualized within Indonesia's ongoing challenge of reducing child marriage which remains among the highest in Southeast Asia in the study supports national policy directions, such as the National Strategy on the Prevention of Child Marriage launched by BAPPENAS, by providing empirical evidence for the effectiveness of preventive education.(22)

The findings from this study suggest that brief, school-based educational interventions on early marriage can significantly improve adolescents' knowledge and awareness regarding the multifaceted risks and consequences of early marriage. These

results underscore the importance of incorporating comprehensive reproductive health education into junior high school curricula as a strategic measure to reduce the incidence of early marriage. The success of this intervention also supports policy efforts by the Indonesian government and global agencies, such as UNICEF and WHO, to promote preventive education as a public health strategy. Additionally, the use of multimedia tools and participatory learning formats indicates the value of delivering content in ways that are engaging and developmentally appropriate for adolescents.

This study is subject to several limitations. First, the use of a one-group pretest-posttest design without a control group limits causal inference; improvements in knowledge cannot be definitively attributed to the intervention alone, as other confounding factors (e.g., peer influence, concurrent school lessons) could have contributed. Second, the short follow-up period of one week post-intervention restricts conclusions about the retention of knowledge over time. Third, the study relied on self-reported measures, which may be subject to response bias. Furthermore, the sample was limited to a single school in a rural district, which may affect the generalizability of the findings to other regions or urban populations with different sociocultural contexts. Future studies should consider using a quasi-experimental or randomized controlled trial (RCT) design with a control group to enhance internal validity. Longitudinal studies with extended follow-up periods are also needed to evaluate the sustainability of knowledge gains and behavioral outcomes, such as intentions to delay marriage. Additionally, research comparing different modes of delivery (e.g., peer education, mobile health platforms, teacher-led interventions) could help identify the most effective strategies for different adolescent populations. Finally, qualitative studies exploring students' perceptions of early marriage education would provide deeper insights into cultural beliefs, barriers, and facilitators influencing program effectiveness.

## CONCLUSION

This study demonstrated that a structured, school-based educational intervention significantly improved the knowledge of Class IX adolescents regarding early marriage at SMPN 1 Cibalang, Tasikmalaya District. The proportion of students with high knowledge levels increased markedly from 31.82% before the intervention to 87.12% after, with all knowledge indicators such as understanding, causes, risks, impacts, and prevention of early marriage showing notable improvements. The statistically significant findings ( $p < 0.001$ ) highlight the effectiveness of targeted educational sessions in enhancing adolescents' awareness of the adverse health, psychosocial, and legal consequences of early marriage.

These results underscore the importance of integrating comprehensive reproductive health education into the school curriculum, particularly in regions where early marriage remains prevalent. By equipping adolescents with accurate information, schools can play a critical role in shaping healthy attitudes and behaviors that support delayed and informed decision-making about marriage. Future initiatives should aim to scale up this intervention through multi-session programs, involve broader community engagement, and assess long-term behavioral outcomes. Further research using controlled designs and diverse adolescent populations is recommended to strengthen the evidence base and inform national policy on adolescent reproductive health education.

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## DECLARATION OF COMPETING INTEREST

No competing interests were disclosed.

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