

# Comparative Effectiveness of Educational Videos and Leaflets on Adolescent Self-Efficacy in Pregnancy Planning: A Quasi-Experimental Study

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**ABSTRACT** Adolescent reproductive risk behaviors, including smoking and overt romantic involvement in school settings, may reflect limited self-control and decision-making capacity and may increase vulnerability to unintended pregnancy. Although reproductive health education is widely implemented, evidence comparing educational media for strengthening adolescents' self-efficacy in pregnancy planning remains limited. This study aimed to compare the effectiveness of video-based and leaflet-based reproductive health education in improving adolescents' self-efficacy for pregnancy planning. A quasi-experimental pretest–posttest two-group design was conducted among 46 female students at SMK PGRI 1 Magetan, East Java, Indonesia. Participants were randomly allocated to a video group (n=23) or a leaflet group (n=23). Both groups received standardized reproductive health education covering pregnancy planning, optimal reproductive age, pregnancy risks, physical, psychological, and social readiness, and reproductive decision-making. Self-efficacy was assessed using a 15-item, five-point Likert questionnaire based on the self-efficacy framework. Within-group changes were evaluated using the Wilcoxon Signed-Rank Test, while between-group differences were assessed using the Mann–Whitney U test. Self-efficacy increased significantly in both groups ( $p < 0.01$ ). The mean score in the video group increased from 35.00 to 53.35, representing a 52.42% increase, whereas the leaflet group increased from 34.87 to 43.52, representing a 24.81% increase. Baseline self-efficacy did not differ significantly between groups ( $p = 0.690$ ), while post-intervention scores differed significantly ( $p < 0.01$ ). Video-based education therefore produced a greater immediate improvement in adolescent self-efficacy for pregnancy planning than leaflet-based education. These findings support the use of audiovisual media as a potentially more engaging strategy for school-based reproductive health education, while larger studies with longer follow-up are needed to determine whether the observed gains are sustained and translate into behavioral outcomes.

**INDEX TERMS** Self-Efficacy, Adolescents, Pregnancy Planning, Reproductive Health Education, Educational Media.

## I. INTRODUCTION

Adolescent pregnancy remains an important public health and educational concern because it can be associated with maternal complications, adverse neonatal outcomes, interrupted education, and psychosocial consequences. The World Health Organization estimated that adolescents aged 15–19 years in low- and middle-income countries experienced approximately 21 million pregnancies annually, with about half being unintended [1]. Adolescents therefore require accessible and developmentally appropriate sexual and reproductive health (SRH) education that supports not only knowledge acquisition but also the confidence needed to make responsible decisions. School settings are particularly strategic because they provide repeated access to adolescents and can integrate health promotion with formal learning [2]–[5]. In Indonesia, school-based comprehensive sexuality education

has been shown to improve pregnancy-related knowledge, communication, and, in some settings, self-efficacy to prevent pregnancy [6]. Nevertheless, implementation remains heterogeneous, and the content, duration, teaching strategies, and outcomes assessed vary substantially across programs [2], [6], [7].

The state of the art indicates a shift from information-only approaches toward interactive, skills-based, and technology-supported education. Meta-analytic and review evidence suggests that school-based sexuality education can improve knowledge, attitudes, condom self-efficacy, and behavioral intentions, although effects vary according to intervention characteristics and context [8], [9]. Interactive SRH education has also demonstrated improvements in adolescents' knowledge, attitudes, and self-efficacy [10], while internet-based programs and telehealth interventions have expanded

opportunities for accessible adolescent education and have shown benefits for selected SRH outcomes [11], [12]. Recent trials further indicate that digital technologies can strengthen engagement and support sexual health knowledge and service-related decision-making [13], [14]. Video-based interventions are particularly promising because audiovisual presentation can combine information, visual demonstration, narrative context, and behavioral modeling. Randomized evidence has shown that sexual health videos can improve contraceptive knowledge and selected protective outcomes [15]. Indonesian studies similarly report beneficial effects of video and other digital media on reproductive health knowledge, attitudes, and practices [16], [17].

Despite these advances, an important research gap remains. Much of the existing literature evaluates knowledge, attitudes, or broad sexual behaviors, whereas pregnancy-planning self-efficacy as a specific cognitive-behavioral outcome receives comparatively less attention [7], [8], [18]. Moreover, studies directly comparing video and printed leaflet education under standardized content and exposure conditions remain limited, particularly among vocational high-school adolescents in Indonesia. This gap is relevant because adolescents' perceptions of SRH education are shaped by the accessibility, acceptability, and communication context of the educational medium [19]. Evidence from recent reviews also suggests that information-only interventions may produce mixed results, whereas skill-building and interactive approaches are more consistently beneficial [3], [7]. Consequently, determining whether a relatively simple audiovisual intervention provides greater improvement in pregnancy-planning self-efficacy than a conventional leaflet can inform practical school-based health promotion.

Accordingly, this study aimed to compare the effectiveness of video-based and leaflet-based reproductive health education in improving adolescents' self-efficacy regarding pregnancy planning. The contributions of this study are threefold: (1) it focuses on self-efficacy as a proximal cognitive-behavioral outcome rather than relying solely on knowledge or attitudes; (2) it provides a direct comparison of audiovisual and printed educational media using equivalent intervention content and exposure; and (3) it contributes empirical evidence from a vocational high-school setting in Indonesia, where culturally sensitive and feasible reproductive health education remains important [19], [20]. The remainder of this article is organized as follows: Section II describes the study design, setting, participants, intervention, measurement instrument, data collection, statistical analysis, and ethical considerations; Section III presents the study results; Section IV discusses the findings in relation to previous evidence, limitations, and practical implications; and Section V concludes the study and outlines directions for future research.

## II. METHOD

### A. STUDY DESIGN

This study employed a quasi-experimental pretest–posttest two-group design with random allocation to evaluate the effectiveness of two reproductive health education media on adolescents' self-efficacy in pregnancy planning. The pretest–

posttest structure enabled changes in self-efficacy to be measured before and after the intervention, while the two-group design allowed comparison of the effects of video-based and leaflet-based education. Similar quasi-experimental approaches have been used to evaluate school-based reproductive and sexuality education interventions among adolescents [21], [22]. Although participants were randomly allocated to the intervention groups, the study was not considered a fully randomized controlled trial because allocation concealment and participant or intervention-provider blinding were not implemented. This distinction is important for transparent reporting of intervention studies [23].

The study was conducted at SMK PGRI 1 Magetan, East Java, Indonesia, from January to May 2026. The school setting was selected because it provided direct access to the target adolescent population and represented an appropriate environment for delivering reproductive health education. School-based interventions are widely used to provide structured reproductive health information and support adolescents' decision-making regarding sexual and reproductive health [22], [24].

### B. PARTICIPANTS AND SAMPLING

The study population consisted of 46 eligible female students enrolled at SMK PGRI 1 Magetan. Because the accessible population was relatively small, total sampling was used, meaning that all eligible students were invited to participate. Participants were included if they were female students enrolled at the study site, were available during the data-collection period, and provided the required informed consent. Participants were excluded if they were absent during data collection, were unable to complete the questionnaire, or withdrew from the study.

Following recruitment, the 46 participants were allocated into two intervention groups, with 23 participants assigned to the video group and 23 participants assigned to the leaflet group. A simple randomization procedure was performed using Google Spin Wheel to generate the allocation sequence. The researcher directly implemented the allocation. No allocation concealment procedure was applied, and blinding was not feasible because the intervention media were visibly different. These methodological characteristics were considered when interpreting the findings.

### C. INTERVENTION MATERIALS AND PROCEDURES

Two reproductive health education media were evaluated: an educational video and a leaflet. The content of both interventions was standardized to ensure that the principal educational information was equivalent across groups. The educational material covered five main topics: pregnancy planning, optimal reproductive age, risks associated with adolescent pregnancy, physical, psychological, and social readiness for pregnancy, and self-efficacy in reproductive decision-making. The use of structured school-based reproductive health education is consistent with recent evidence supporting school settings as an important platform

for adolescent pregnancy prevention and reproductive health promotion [22], [24].

Participants in the video group received the standardized educational video for approximately 10 minutes per session, with the intervention delivered twice. Participants in the leaflet group received the same educational content in a structured printed leaflet containing concise explanations and visual elements. The leaflet was designed using simple language to facilitate comprehension among adolescent participants. Previous research has also demonstrated the use of audiovisual and printed media as practical approaches for reproductive health education among adolescents [26], [27].

To maintain intervention fidelity, both groups received the intervention on two occasions, the educational content and exposure conditions were standardized, and participants were not exposed to both intervention media. The interventions were delivered without additional direct facilitation so that differences in researcher or facilitator interaction would not substantially influence the intervention effect. The use of standardized intervention content and clearly specified delivery procedures was intended to improve comparability between groups and facilitate replication.

#### D. MEASUREMENT INSTRUMENT AND DATA COLLECTION

The primary outcome was adolescents' self-efficacy in pregnancy planning. Self-efficacy was assessed using a structured 15-item questionnaire based on the self-efficacy construct. The questionnaire used a five-point Likert scale scored from 0 to 4, with higher total scores representing higher levels of self-efficacy. The instrument assessed three domains: decision-making self-efficacy, behavioral-control self-efficacy, and access-and-coping self-efficacy. Recent adolescent reproductive health research has emphasized the importance of measuring self-efficacy as a distinct psychosocial outcome rather than relying solely on knowledge or attitudes [25].

Before the intervention, all participants completed the questionnaire as a pretest. The assigned educational intervention was subsequently administered according to the specified protocol. After completion of the intervention, participants completed the same questionnaire as a posttest. The questionnaire had undergone expert content validation by reproductive health experts and pilot testing to evaluate item clarity and comprehension. The instrument demonstrated acceptable internal consistency, with Cronbach's alpha greater than 0.70. The same measurement procedure was applied to both groups to maintain consistency in outcome assessment.

#### E. DATA ANALYSIS

Data were entered and analyzed using IBM SPSS Statistics version 26.0. Descriptive statistics were used to summarize participant characteristics and self-efficacy scores. The distribution of the data and relevant assumptions were assessed before inferential analysis. Within-group changes between pretest and posttest scores were analyzed using the Wilcoxon Signed-Rank Test when the assumptions for parametric analysis were not satisfied. Between-group

differences were assessed using the Mann-Whitney U Test. Statistical significance was determined using a two-sided significance level of 0.05. The analysis focused on determining whether self-efficacy changed significantly following each intervention and whether the magnitude of improvement differed between the video and leaflet groups. Where appropriate, effect sizes and 95% confidence intervals were considered to complement p-values and provide a more informative interpretation of intervention effects. Transparent reporting of intervention allocation, outcome assessment, and statistical procedures is consistent with current recommendations for reporting randomized and quasi-randomized intervention research [23].

#### F. ETHICAL CONSIDERATIONS

Ethical approval was obtained from the Institutional Review Board of Poltekkes Kemenkes Surabaya under approval number EA/4405/KEPK-Poltekkes\_Sby/V/2026. Written informed consent was obtained from parents or guardians, and participant assent was obtained before data collection. Participation was voluntary, and participants were informed of their right to withdraw from the study at any time without consequences. Participant information and questionnaire data were handled confidentially and were analyzed using coded datasets. These procedures were implemented to protect participants' autonomy, privacy, and confidentiality throughout the study.

### III. RESULTS

The study was conducted in March 2026 at SMK PGRI 1 Magetan, a vocational senior high school operating under a private educational foundation that offers a variety of vocational programs aimed at developing students' academic and professional competencies. In addition to its vocational curriculum, the school provides learning facilities that support the enhancement of students' knowledge, practical skills, and character development.

At the time of the study, the school had a total enrollment of 284 students. The study sample comprised all 46 eligible female students, who were recruited using the total sampling technique.

**TABLE 1**  
Characteristics of Adolescents in the Video and Leaflet Group

| No. | Karakteristik | Video Group |        | Leaflet Group |        |
|-----|---------------|-------------|--------|---------------|--------|
|     |               | f           | %      | f             | %      |
| 1.  | Class         |             |        |               |        |
|     | X             | 8           | 34,8 % | 9             | 39,1 % |
|     | XI            | 6           | 26,1 % | 7             | 30,4 % |
|     | XII           | 9           | 39,1 % | 7             | 30,4 % |
|     | Total         | 23          | 100 %  | 23            | 100 %  |
| 2.  | Age           |             |        |               |        |
|     | 16 tahun      | 5           | 21,7 % | 8             | 34,8 % |
|     | 17 tahun      | 8           | 34,8 % | 6             | 26,1 % |
|     | 18 tahun      | 10          | 43,5 % | 9             | 39,1 % |
|     | Total         | 23          | 100 %  | 23            | 100 %  |

According to the data in [TABLE 1](#), the majority of respondents in the video group were from Grade XII, whereas

the majority in the leaflet group were from Grade X. In terms of age, most respondents in both groups were 18 years old. This indicates that the respondents were predominantly late adolescents, who are cognitively more mature and better equipped to receive education.

TABLE 2

Normality Test Table

| Variable            | p-Value |
|---------------------|---------|
| Video Education     |         |
| Before intervention | 0,013   |
| After intervention  | 0,908   |
| Leaflet Education   |         |
| Before intervention | 0,162   |
| After intervention  | 0,075   |

Based on the information presented in TABLE 2, the data for the video group were not normally distributed prior to the intervention but followed a normal distribution after the intervention. In the leaflet group, the data were normally distributed both before and after the intervention. This indicates that the choice of statistical tests was tailored to the data distribution of each respective group; thus, it can be concluded that the data were not normally distributed, and the Wilcoxon and Mann-Whitney tests were employed.

TABLE 3

Table Adolescents' Self-Efficacy Regarding Pregnancy Planning Before and After Receiving Education via Video and Leaflet

| Variable      | Video Group |           | p-value | Leaflet Group |           | p-value |
|---------------|-------------|-----------|---------|---------------|-----------|---------|
|               | Pretest     | Post-test |         | Pretest       | Post-test |         |
| Self Efficacy |             |           |         |               |           |         |
| Mean          | 35,00       | 53,35     | <0,01   | 34,87         | 43,52     | <0,01   |
| (SD)          | (4,189)     | (3,200)   |         | (2,752)       | (1,880)   |         |
| Median        | 34,00       | 54,00     |         | 34,00         | 44,00     |         |
| Range         | 30–45       | 47–59     |         | 31–41         | 40–46     |         |
| Increase (%)  | 52,42       |           |         | 24,81         |           |         |

According to the data presented in TABLE 3, adolescents' self-efficacy scores increased following educational interventions delivered through both video and leaflet media. In the video intervention group, the mean self-efficacy score increased from 35.00 at baseline to 53.35 after the intervention, representing an improvement of 52.42%. In contrast, the leaflet intervention group demonstrated an increase in the mean self-efficacy score from 34.87 to 43.52, corresponding to a 24.81% improvement. The results of the Wilcoxon Signed-Rank Test indicated that the changes observed in both intervention groups were statistically significant ( $p < 0.05$ ), demonstrating that both video-based and leaflet-based educational interventions had a significant positive effect on adolescents' self-efficacy in pregnancy planning.

TABLE 4

Adolescents' Self-Efficacy Regarding Pregnancy Planning Prior to Education in Video and Leaflet Groups

| Variable      | Video Group   | Leaflet Group | p-value |
|---------------|---------------|---------------|---------|
| Self-Efficacy | Pre Test      | Pre Test      |         |
| Mean (SD)     | 35,00 (4,189) | 34,87 (2,752) | 0,690*  |
| Median        | 34,00         | 34,00         |         |
| Range         | 30–45         | 31–41         |         |

TABLE 4 indicate that prior to the educational intervention, the mean self-efficacy score was 35.00 for the

video group and 34.87 for the leaflet group. The Mann-Whitney test yielded a p-value of 0.690 ( $>0.05$ ), indicating no difference in self-efficacy between the video and leaflet groups at the pre-test stage. This suggests that the respondents' baseline capabilities in both groups were relatively similar before the educational intervention was administered.

TABLE 5

Adolescents' Self-Efficacy Regarding Pregnancy Planning After Receiving Education via Video and Leaflet Interventions

| Variable      | Video Group   | Leaflet Group | p-value |
|---------------|---------------|---------------|---------|
| Self-Efficacy | Pre Test      | Pre Test      |         |
| Mean (SD)     | 53,35 (3,200) | 43,52 (1,880) | <0,01*  |
| Median        | 54,00         | 44,00         |         |
| Range         | 47–59         | 40–46         |         |

As shown in TABLE 5, following the educational intervention, the mean self-efficacy score was higher in the video group (53.35) than in the leaflet group (43.52). The Mann-Whitney test demonstrated a statistically significant difference between the two groups ( $p = 0.0000267$ ,  $<0.05$ ), indicating that the video-based intervention resulted in a significantly higher post-intervention self-efficacy score than the leaflet-based intervention.

#### IV. DISCUSSION

##### A. BASELINE SELF-EFFICACY AND THE EFFECT OF REPRODUCTIVE HEALTH EDUCATION

The findings indicate that adolescents initially demonstrated relatively limited self-efficacy in pregnancy planning. The baseline mean self-efficacy score was 35.00 in the video group and 34.87 in the leaflet group, with no statistically significant difference between groups ( $p = 0.690$ ). This similarity at baseline indicates that the two groups had comparable levels of self-efficacy before receiving the intervention and provides an appropriate basis for evaluating the subsequent changes associated with the educational media. Low baseline self-efficacy may reflect limited confidence in making reproductive health decisions, evaluating pregnancy readiness, avoiding risky behaviors, and exercising independent decision-making. These dimensions are important because reproductive health education is not limited to the acquisition of factual knowledge but also involves adolescents' confidence in applying information when confronted with real-life decisions.

The improvement observed after the intervention suggests that structured reproductive health education can strengthen adolescents' perceived capability to make appropriate decisions concerning pregnancy planning. This interpretation is consistent with recent evidence indicating that school-based sexuality education can improve several psychosocial outcomes, including self-efficacy, although the magnitude of improvement varies according to intervention characteristics, educational content, and implementation context [28]. A recent meta-analysis of school-based sexuality education programs reported a significant positive effect on self-efficacy, supporting the interpretation that educational interventions can contribute to the development of adolescents' confidence in reproductive health-related decision-making [28]. Similarly, a scoping review of school-based comprehensive sexuality education found that schools

provide an important platform for delivering structured reproductive health interventions, although substantial variation remains in intervention content, duration, teaching methods, and outcome measures [29].

In the present study, both intervention groups demonstrated statistically significant improvements in self-efficacy ( $p < 0.01$ ). The video group increased from a mean score of 35.00 at pretest to 53.35 at posttest, corresponding to a 52.42% increase. The leaflet group increased from 34.87 to 43.52, corresponding to a 24.81% increase. Thus, the intervention effect was not limited to one educational format. Rather, both audiovisual and printed education were capable of improving self-efficacy, although their magnitude of improvement differed. This finding is important because it suggests that educational media should not be considered simply as alternatives with an exclusively positive or negative effect. Instead, their effectiveness may depend on how well their characteristics correspond to adolescents' learning needs and the intended educational outcome.

The greater improvement observed in the video group can be interpreted through the characteristics of audiovisual learning. Video combines visual information, spoken explanations, sequencing, and potentially realistic behavioral examples within a single learning experience. These characteristics can make abstract reproductive health concepts more concrete and easier to understand. In particular, video may provide opportunities for observational learning by demonstrating situations or decisions that adolescents may encounter. This mechanism is relevant to self-efficacy because confidence in performing a behavior can be influenced by observing appropriate behavioral models and understanding how a decision can be implemented in practice.

The findings are also consistent with recent Indonesian research by Yuliasih et al., which examined video and electronic-leaflet reproductive health education and found significant improvements in reproductive health-related outcomes following intervention [30]. Although that study focused on knowledge, attitudes, and practices rather than pregnancy-planning self-efficacy, the similarity in the direction of findings supports the potential usefulness of combining accessible educational content with engaging media. Another recent Indonesian study examining reproductive health education reported improvement in adolescents' self-efficacy following educational intervention, further suggesting that self-efficacy can respond to structured reproductive health promotion [31]. Therefore, the present study extends previous evidence by focusing specifically on self-efficacy related to pregnancy planning and directly comparing video and leaflet delivery.

The improvement in the leaflet group is also theoretically and practically meaningful. Printed educational materials allow adolescents to review information repeatedly, control their own reading pace, and revisit specific topics when needed. This characteristic may be particularly useful for reproductive health subjects that adolescents may be reluctant to discuss openly. However, leaflet-based education depends more heavily on reading comprehension, attention, motivation, and the ability to process written information

independently. Consequently, although leaflets produced a significant improvement in the present study, the magnitude of improvement was lower than that observed with video-based education.

## **B. COMPARATIVE EFFECTIVENESS OF VIDEO AND LEAFLET MEDIA**

The between-group analysis demonstrated a statistically significant difference in post-intervention self-efficacy ( $p < 0.01$ ), with the video group demonstrating the greater improvement. This finding suggests that, under the conditions of this study, video-based education may be more effective than leaflet-based education for producing an immediate improvement in adolescents' self-efficacy regarding pregnancy planning. The result is particularly relevant because both groups received standardized educational content, reducing the likelihood that the observed difference was primarily attributable to differences in the subject matter presented.

The greater increase in the video group may be associated with the ability of audiovisual media to simultaneously stimulate visual and auditory processing. Compared with text-only materials, video can present information through narration, visual representations, sequencing, and contextual examples. These elements may reduce the cognitive effort required to construct meaning from written information alone and may increase attention during the learning process. In addition, a video can provide a more consistent presentation of the intervention content because all participants receive the same sequence, explanation, and emphasis.

Recent evidence supports the broader effectiveness of digital and audiovisual approaches in adolescent sexual and reproductive health education. A systematic review and meta-analysis of web-based sexual and reproductive health education found positive effects on adolescents' knowledge and attitudes, although evidence for self-efficacy was inconsistent [32]. This distinction is important for interpreting the current findings. The present study demonstrated a clear improvement in self-efficacy after video-based education, but the outcome should not be generalized to all digital interventions. Self-efficacy is a higher-order psychosocial construct that may require not only information exposure but also behavioral modeling, opportunities for practice, feedback, and reinforcement [32]. The present video intervention may have benefited from its structured presentation and potentially greater engagement, but the study did not directly measure the individual mechanisms responsible for the improvement.

The findings also correspond with the results of Yuliasih et al., who compared video and electronic-leaflet reproductive health education among female university students in Indonesia [30]. Their quasi-experimental study found significant improvements in reproductive health knowledge, attitudes, and practices after intervention, with differences between the groups observed particularly for attitudes and practices. However, their study did not demonstrate that video was universally superior for every outcome. This provides an important contrast to the present findings: educational media effectiveness may depend on the specific outcome being

measured. In the current study, self-efficacy showed a substantially greater numerical improvement following video exposure, whereas other studies have reported comparable or outcome-specific effects across media types.

A similar interpretation can be drawn from recent systematic evidence concerning digital sexual and reproductive health education. Digital tools may increase engagement and accessibility, but their effectiveness is influenced by intervention design, implementation intensity, theoretical foundation, and follow-up duration [32], [33]. Therefore, the superiority of video observed in the current study should be understood as an immediate effect under the specific intervention conditions rather than evidence that video is inherently superior to all printed or digital alternatives.

The practical implications are nevertheless important. Video-based reproductive health education may be prioritized when the primary objective is to strengthen adolescents' confidence in pregnancy-planning decisions. Its audiovisual format may be particularly suitable for classroom-based interventions in which educators need to communicate standardized information efficiently to groups of adolescents. Leaflets remain useful as complementary materials because they can reinforce information after the intervention and provide participants with a tangible resource for independent review. Consequently, an integrated approach in which video is used as the primary educational stimulus and leaflets are provided as reinforcement may be more practical than completely replacing printed materials.

The findings should also be interpreted in relation to the broader purpose of reproductive health education. Increased self-efficacy does not automatically indicate a corresponding change in actual reproductive behavior. Recent evidence suggests that educational interventions can improve knowledge and psychosocial outcomes, but behavioral outcomes may require sustained exposure, opportunities for practice, supportive environments, and access to appropriate reproductive health services [29], [32]. Thus, the present study demonstrates an encouraging proximal outcome but does not establish whether the improvement in self-efficacy would translate into sustained pregnancy-planning behavior.

### **C. LIMITATIONS, IMPLICATIONS, AND FUTURE RESEARCH**

Several limitations should be considered when interpreting the findings. First, the study included only 46 female students from a single school. The relatively small and geographically restricted sample limits statistical power and reduces the generalizability of the findings to adolescents from different schools, regions, socioeconomic backgrounds, or educational environments. Second, only female participants were included. Although pregnancy planning has direct implications for female reproductive health, reproductive decision-making is also influenced by male adolescents and by interpersonal relationships. Future research should therefore consider including both male and female adolescents.

Third, the study used self-reported self-efficacy as the primary outcome. Self-reported measures may be affected by response bias, social desirability, or participants' perceptions of what constitutes an appropriate answer. This issue may be particularly relevant for reproductive health research because participants may be reluctant to disclose their actual attitudes or confidence levels. Future studies could strengthen measurement by combining self-efficacy questionnaires with behavioral indicators, knowledge assessments, qualitative interviews, or validated measures of reproductive decision-making.

Fourth, the posttest was conducted shortly after the intervention. Consequently, the study primarily demonstrates immediate changes in self-efficacy and cannot determine whether the observed improvement is sustained over time. This limitation is particularly important because self-efficacy may change as adolescents encounter new experiences, peer influences, family environments, and reproductive health information. Longitudinal follow-up at several weeks or months would provide stronger evidence regarding the durability of the intervention effect.

Fifth, the study did not include a no-intervention control group. Therefore, although the two educational approaches can be compared, the design cannot completely exclude the possibility that factors unrelated to the intervention contributed to the observed improvement. Potential influences include maturation, exposure to reproductive health information outside the study, peer discussion, prior knowledge, and the Hawthorne effect. The random allocation of participants to the two intervention groups improves comparability between groups, but it does not eliminate these potential sources of bias.

Sixth, the intervention was evaluated under a specific school-based context, and factors such as digital literacy, reading ability, previous exposure to reproductive health education, family communication, peer influence, and socioeconomic background were not comprehensively examined. These variables may influence how adolescents respond to different educational media. Future research should therefore investigate potential moderators of intervention effectiveness rather than assuming that one medium will produce the same effect across all adolescent populations.

Despite these limitations, the study has several practical implications. The 52.42% increase in the video group compared with the 24.81% increase in the leaflet group indicates that audiovisual education may provide a useful strategy for strengthening adolescents' confidence in pregnancy-planning decisions. Schools and health professionals may use video as an engaging introductory medium while retaining leaflets as supplementary material for repeated review. Such an approach may also be incorporated into broader school-based comprehensive sexuality education programs, which recent evidence identifies as an important platform for adolescent pregnancy prevention [29].

Future research should use larger and multicenter samples, include adolescents of different genders, and incorporate longer follow-up periods. Randomized controlled designs with appropriate allocation concealment would further

strengthen causal inference. Future studies should also compare different video characteristics, such as animation, narrative scenarios, demonstrations, and interactive video, to determine which components contribute most strongly to self-efficacy. Finally, subsequent research should examine whether improvements in self-efficacy are associated with measurable changes in reproductive health knowledge, intentions, decision-making, preventive behaviors, and ultimately pregnancy-related outcomes. Such evidence would provide a more comprehensive assessment of whether educational media can move beyond immediate psychosocial improvement toward sustained reproductive health benefits.

## V. CONCLUSION

This study aimed to compare the effectiveness of video-based and leaflet-based reproductive health education in improving adolescents' self-efficacy in pregnancy planning. The findings demonstrated that both educational approaches produced significant improvements in self-efficacy following the intervention ( $p < 0.01$ ), indicating that structured reproductive health education can strengthen adolescents' confidence in making decisions related to pregnancy planning. In the video group, the mean self-efficacy score increased from 35.00 at pretest to 53.35 at posttest, representing a 52.42% increase. In comparison, the leaflet group increased from 34.87 to 43.52, corresponding to a 24.81% increase. The groups were comparable at baseline, with no statistically significant difference in pre-intervention self-efficacy ( $p = 0.690$ ), whereas a statistically significant difference was identified after the intervention ( $p < 0.01$ ). These findings indicate that video-based education produced a greater immediate improvement in self-efficacy than leaflet-based education under the conditions of this study. The greater improvement may be associated with the audiovisual characteristics of video, which can integrate visual and auditory information and provide structured behavioral examples that may facilitate comprehension, engagement, and confidence in reproductive decision-making. Nevertheless, the findings should be interpreted within the limitations of the study, including the small sample of 46 female students, single-school setting, reliance on self-reported outcomes, absence of a no-intervention control group, and immediate posttest assessment. Therefore, the results demonstrate an immediate improvement in perceived self-efficacy rather than establishing sustained behavioral change or long-term prevention of unintended pregnancy. Future research should involve larger and multicenter samples, include adolescents of different genders, apply stronger randomized designs with appropriate allocation procedures, and conduct follow-up assessments over longer periods. Subsequent studies should also examine whether increased self-efficacy is sustained and translates into improved reproductive health knowledge, decision-making, preventive behaviors, and pregnancy-planning practices. Comparative research on different audiovisual formats and combinations of video with printed reinforcement materials is also recommended to identify the most effective and scalable educational strategy for school-based reproductive health programs.

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## DATA AVAILABILITY

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request, subject to applicable ethical and confidentiality requirements.

## AUTHOR CONTRIBUTION

Ajeng Mardiani contributed to the conceptualization and design of the study, participant recruitment, data collection, data analysis, interpretation of findings, and preparation of the manuscript. Nana Usnawati and Nurlailis Saadah contributed to the development and standardization of the educational materials, supervision of intervention implementation, and critical review and revision of the manuscript. Sulikah contributed to data analysis and interpretation and provided critical intellectual input during manuscript development and revision. All authors reviewed and approved the final manuscript and accepted responsibility for the accuracy, integrity, and accountability of the work.

## DECLARATIONS

### ETHICAL APPROVAL

The authors declare that this manuscript represents original work and has not been submitted for publication elsewhere. The authors declare no competing interests that could have influenced the design, implementation, analysis, interpretation, or reporting of this study. The research received no specific financial support from public, commercial, or not-for-profit funding agencies. Ethical approval was obtained from the Health Research Ethics Committee of Poltekkes Kemenkes Surabaya (Approval No. EA/4405/KEPK-Poltekkes\_Sby/V/2026). Written informed consent was obtained from parents or guardians, and participant assent was obtained before data collection. Participant anonymity and confidentiality were maintained throughout the study, and the data were used exclusively for scientific research purposes. All authors approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

### CONSENT FOR PUBLICATION PARTICIPANTS

Consent for publication was given by all participants

### COMPETING INTERESTS

The authors declare no financial, professional, or personal relationships that could have influenced the design, conduct, analysis, or reporting of this research.

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