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Changes in adolescents' reproductive health knowledge following video-based education and group discussion in a disaster-affected community

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Abstract

Background: The cold lava flow disaster in Bukik Batabuah in 2024 resulted in 10 fatalities and 74 displaced persons. Based on 2025 data from the Agam Population and Civil Registration Office, 1,649 adolescents in this area are vulnerable to reproductive health risks due to limited sanitation and a loss of privacy following the disaster. Reproductive health education is essential to improve disaster emergency preparedness.
Purpose: To determine the effect of reproductive health education using a combination of animated videos and discussion methods on the knowledge levels of adolescents.
Method: This pre-experimental quantitative study (One-Group Pretest-Posttest Design) was conducted on June 19, 2026, at SMPN 4 Canduang. The sample consisted of 31 respondents selected using total sampling. The intervention consisted of showing a reproductive health animated video (3 minutes) and an interactive discussion (40 minutes). Data were analyzed using the Wilcoxon Signed-Rank Test.
Results: In the pretest, the respondents' knowledge was categorized as "Fair" (45.2%) and "Poor" (22.5%), with a median of 6.00. After the intervention (posttest), the students' knowledge improved to the "Good" category (87.1%), with a median of 8.00. The Wilcoxon Signed-Rank Test yielded an Asymp. Sig. (2-tailed) value of 0.001 ($p < 0.05$); therefore, $H_0$was rejected and $H_1$was accepted, proving that the combined intervention had a significant effect.
Conclusion: Reproductive health education in disaster situations, delivered through a combination of animated videos and discussion-based methods, effectively improves cognitive understanding among adolescents.
Suggestion: Schools are advised to adopt this interactive audiovisual intervention package for ongoing reproductive health education and outreach activities.

Keywords: Adolescents; Animated Videos; Group Discussions; Reproductive Health.

INTRODCUTION

The village of Bukik Batabuah, in Canduang Subdistrict, is among the areas most vulnerable to volcanic and hydrometeorological hazards from Mount Marapi. This was evident from the cold lava flood disasters on April 5 and May 11, 2024, which made it one of the hardest-hit areas in Agam Regency. To date, Mount Marapi's Level II (Alert) status requires the community to remain vigilant, particularly when the flow of lahars increases during the rainy season (National Board for Disaster Management, 2025; Primananda, 2025).

Given the complexity of disaster threats, a comprehensive and sustainable disaster management system is required. According to Law of the Republic of Indonesia No. 24 of 2007, disaster management is an integrated process that encompasses the stages of prevention, mitigation, preparedness, emergency response, and rehabilitation and reconstruction. This is reinforced in Regulation of the Minister of Health of the Republic of Indonesia No. 64 of 2013, which emphasizes the importance of community empowerment in preparedness activities within their respective regions (Legal Documentation and Information Network, 2007; Ministry of Health of the Republic of Indonesia, 2013).

One form of empowerment that is urgently needed by adolescents in Nagari Bukik Batabuah is

reproductive health education in emergency situations, as adolescents are considered a vulnerable group. According to the United Nations Population Fund (UNFPA), adolescents face an increased risk of early marriage, sexual violence, and unintended pregnancy, as well as limited access to reproductive health services during disasters and crises (Tanabe, 2013; Milawaty, 2021).

Previous research demonstrated a significant effect of reproductive health education on knowledge of health crisis preparedness among adolescents in disaster-prone areas; however, the intervention used was still limited to conventional lecture methods (Handayani, 2018). In contrast, another study demonstrated the effectiveness of using animated video media in improving reproductive health knowledge, though it was not specifically conducted in disaster-prone areas (Ilhami et al., 2022).

Another study also demonstrated that the combination of video media and interactive discussions is effective in improving adolescents' knowledge; however, the material provided did not address reproductive health in the context of disasters (Muflih et al., 2023).

RESEARCH METHOD

This quantitative study employed a pre-experimental design using the One-Group Pretest-Posttest Design (O1 → X → O2). The study was conducted at SMP Negeri 4 Canduang, Nagari Bukik Batabuah, Agam Regency, West Sumatra, on June 19, 2026.

The study population consisted of all 42 students at SMPN 4 Canduang. Sampling was conducted using total sampling. However, during field implementation, 11 students were absent and thus dropped out due to failing to meet the inclusion criteria. Consequently, the final sample comprised 31 students who fully participated in the entire research sequence (pretest, intervention, and posttest).

The intervention consisted of a single 3-minute screening of an animated video on reproductive health, followed by a 40-minute interactive discussion and question-and-answer session. Knowledge was measured using a multiple-choice questionnaire comprising 9 items. Correct answers were scored as 1 and incorrect answers as 0. Knowledge levels were categorized as Good (7-9), Fair (5-6), and Poor (<4).

Data analysis included univariate analysis to examine the frequency distribution of respondent characteristics as well as pre-test and post-test scores. Since the Shapiro-Wilk normality test ($n<50$) indicated that the data were not normally distributed ($p<0.05$), bivariate analysis was performed using the nonparametric Wilcoxon Signed-Rank Test with a significance level of $\alpha = 0.05$.

RESEARCH RESULTS

Table 1. Respondent of Characteristics (N=31)

Variable	Results
Age (Mean±SD) (Years) (Range)	(14.00 ± 0.82) (13-15)
13	15/48.4
14	11/35.5
15	5/16.1

Based on Table 1, it can be seen that of the total 31 respondents, the largest age group consisted of 13-year-olds, numbering 15 people (48.4%). This was followed by the group of 14-year-olds, numbering 11 people (35.5%), and the smallest group consisted of 15-year-olds, numbering 5 people (16.1%). Next, knowledge levels were assessed before (pre-test) and after (post-test) the educational intervention. A summary of the changes in the mean, median, and standard deviation is presented in Table 2.

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Table 2. Pre-test and Post-test Results for Adolescents' Knowledge Levels

Measurement	Mean	Median	Standard Deviation (SD)	Minimum score	Maximum score
Pre-test	5.52	6.00	1.964	0	9
Post-test	7.61	8.00	1.283	4	9

Table 2. shows an increase in the mean score from 5.52 (Fair) to 7.61 (Good), with the median jumping from 6.00 to 8.00. Furthermore, the decrease in the standard deviation from 1.964 to 1.283 indicates that students' cognitive understanding after the intervention became more homogeneous within the higher score range. At the pre-test, the majority of respondents fell into the "Fair" (45.2%) and "Poor" (22.5%) categories. After the intervention (post-test), a significant cognitive shift occurred, with the absolute majority of respondents (87.1%) reaching the "Good" category. After conducting univariate tests, bivariate tests were then performed using the Wilcoxon Signed-Rank Test to analyze differences in knowledge levels before and after the intervention. The results of the analysis are presented.

Table 3. Results of the Wilcoxon Test on the Effect of Video and Discussion Media on Knowledge

Variable	Median	Z-Value	Asymp. Sig. (2-tailed)
Pre-test	6	- 4.609	0.001
Post-test	8	- 4.609	0.001

Based on Table 3. the Asymp. Sig. (2-tailed) value is 0.001 ($p < 0.05$) with a Z-value of -4.609. Since $p < 0.05$, H_0 is rejected and H_1 is accepted. The negative sign of the Z-value confirms the direction of the change in knowledge scores, which increased significantly from the pre-test to the post-test.

DISCUSSION

The results of this study demonstrate that providing reproductive health education through a combination of animated videos and discussion-based methods has a significant impact on improving the knowledge of adolescents at JHS 4 Canduang. These findings are consistent with another study which found a significant increase in adolescents' knowledge after they received education combining video presentations and interactive discussions (Muflih et al., 2023).

Adolescents in this category likely do not yet understand the importance of maintaining personal hygiene of the genital area during disasters, how to manage hygiene safely in evacuation centers with limited water supplies, or how to protect themselves from the risk of sexual violence, which is prone to occur in densely populated evacuation areas. The gap between the high risk of disasters in Bukik Batabuah and the adolescents' low knowledge classification on the pre-test underscores the need for a targeted, promotive media intervention to shift their understanding to the "Good" classification before an actual disaster occurs.

After the adolescents received an intervention consisting of an educational animated video combined with a 40-minute question-and-answer discussion, there was a cognitive improvement in the post-test results. The group's median score jumped to 8.00, and the majority of adolescents (87.1%) successfully moved into the "Good" knowledge category. This is also consistent with another findings, which showed that educational videos can improve the average score on knowledge about adolescent reproductive health (Tanjaya et al., 2025).

Theoretically, the high impact of the intervention was driven by the combination of animated video media and interactive discussions in conveying audiovisual messages, reinforced by group discussions following the video screening. The results of this study are closely related to Edgar Dale's "Cone of Experience" theory, which states that an individual's retention (memory) of cognitive information increases when learning methods involve the use of more senses and active engagement.

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Conventional education that relies solely on lectures (abstract/verbal media) typically results in only about 20% retention because it relies solely on the sense of hearing. In contrast, the intervention in this study combined audiovisual media (watching animated videos) with active engagement (40-minute group discussion and Q&A sessions), thereby optimizing adolescents' cognitive information retention to reach 50% (Pagarra et al., 2022).

These findings align with a previous study which demonstrated a highly significant improvement in adolescents' knowledge from the "inadequate" to the "good" category following health education delivered via animated video (Ilhami et al., 2022). These findings also reinforce the study which confirms that reproductive health education has a highly significant impact on strengthening knowledge of health crisis preparedness among adolescents living in disaster-prone areas (Handayani, 2018).

The researchers hypothesize that the absorption of the material was also aided by a 40-minute question-and-answer session, with the post-test results reflecting short-term retention in working memory. Although significant changes were observed following the intervention, during the discussion sessions, some students demonstrated a lack of understanding regarding the maintenance of reproductive organ hygiene because the educational material was presented to both male and female participants without being separated by gender. Consequently, some male students did not understand how to maintain the hygiene of female reproductive organs, and vice versa. Therefore, these findings highlight the importance of modifying the discussion method in the future by separating groups by gender so that adolescents can explore reproductive health information more openly and comfortably.

CONCLUSION

Reproductive health education delivered through animated video and discussion-based methods was shown to significantly ($p = 0.001$) improve the cognitive understanding of early adolescents, raising it from the "Fair" category (median 6.00) to the "Good" category (median 8.00; 87.1%).

SUGGESTION

This audiovisual approach, combined with active interaction, is effective when implemented as a health promotion strategy to strengthen disaster preparedness among vulnerable groups.

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