



## Reproductive Health Literacy Enhancement through School-Based Health Education for Adolescents

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### ABSTRACT

**Purpose of the study:** This study aims to see the influence of health education about reproductive health on students' level of knowledge.

**Methodology:** The research sample used was 24 people using a convenience sampling technique. The method used was a pre-experimental design with a one-group pre-test post-test design. Data collection used a questionnaire as a research instrument. The data analysis technique used was the Wilcoxon test.

**Main Findings:** The results of the study showed that students' knowledge before receiving health education had an average value of 81.9%, and after receiving health education it increased to 86.3%. The results of the hypothesis test with an alpha error rate of 0.05 obtained a p value > 0.05, meaning there was no significant difference in adolescents' knowledge before and after receiving health education.

**Novelty/Originality of this study:** This research presents a novel approach by in-depth examining the influence of health education on improving adolescents' knowledge of reproductive health using a contextual and interactive educational approach. The focus on adolescents in the digital age makes these findings crucial for developing more relevant, responsive, and sustainable school intervention strategies.

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## 1. INTRODUCTION

Based on the 2010 Population Census, the number of adolescents aged 10–24 in Indonesia reached 64 million, or approximately 27.6% of the total population. This figure indicates that adolescents are a highly significant age group and play a strategic role in national development [1], [2]. Adolescence is a transitional phase from childhood to adulthood, marked by physical, psychological, and social changes [3]–[5]. These changes can pose various challenges in adolescent development, especially if not accompanied by adequate knowledge and guidance. Therefore, adolescents need to be prepared to become a physically, spiritually, and mentally-spiritually healthy generation [6]–[8].

Unfortunately, the reproductive health of adolescents in Indonesia remains far from ideal, especially when compared to other ASEAN countries. Data from the Directorate General of Public Health and the National Population and Family Planning Agency shows that Indonesia lags behind in terms of services and understanding related to reproductive health [9], [10]. Many adolescents still experience problems such as unwanted pregnancies, sexually transmitted infections, and sexual violence [11], [12]. Lack of access to

reproductive health information is a major cause of low awareness among adolescents about the importance of maintaining reproductive health [13]-[15]. The societal perception that sexuality is taboo further exacerbates this situation.

Most parents feel reluctant or uncomfortable discussing reproductive issues with their children. As a result, teenagers prefer to seek information from other, less accurate sources, such as the internet, television, or social media [16], [17]. Adolescents' low knowledge regarding fertility, pregnancy risks, and premarital sex indicates an educational gap [18], [19]. National Population and Family Planning Board data shows that only around 29% of adolescent girls and 32.3% of adolescent boys are aware of their fertility. Furthermore, many adolescents know that their peers have engaged in premarital sex [20], [21].

This low level of adolescent knowledge about reproductive health is reflected in various alarming national data. A 2012 National Population and Family Planning Board survey showed that only 49.5% of adolescent girls and 45.5% of adolescent boys were aware of the risks of pregnancy resulting from their first sexual intercourse. Furthermore, around 34.7% of adolescent girls and 30.9% of adolescent boys aged 14–19 admitted to having friends who had engaged in premarital sex. This figure increases in the 20–24 age group, to 48.6% and 46.5%, respectively. This data confirms that reproductive health education remains very limited and unequally distributed among adolescents.

Inaccurate information can lead adolescents to make poor decisions regarding sexual behavior. Therefore, appropriate interventions through comprehensive and ongoing health education are needed. Health education must be provided early so that adolescents develop responsible attitudes and behaviors regarding their bodies and health [22]-[24]. The WHO also emphasizes the importance of reproductive education for young adolescents, particularly those aged 10–14, which is the golden age for behavioral formation [25], [26]. Through a promotive and preventive approach, healthy behaviors can be instilled more effectively.

Unfortunately, reproductive health education in Indonesia currently targets high school students more than junior high school students [27], [28]. Yet, early adolescents, or junior high school students, are at a crucial developmental stage in their search for identity and understanding biological and emotional changes [3], [29]. They tend to be more curious and easily influenced by their surroundings. Therefore, providing reproductive health education during this period is crucial to equip them with the right knowledge and values [30], [31]. The Ministry of Health recommends that educational interventions begin as early as junior high school to optimize prevention.

One approach that has proven effective in increasing adolescent knowledge is health education through interactive lectures [32], [33]. This method allows adolescents to receive information directly and ask questions about anything they don't understand. A preliminary study revealed that most students had never received specific reproductive health education [34], [35]. However, interviews revealed that most students held positive attitudes toward premarital sex due to a lack of accurate information [36], [37]. Therefore, this study aimed to determine the effect of health education on improving adolescents' knowledge about reproductive health.

The research by Khanal et al., [38] focused on improving adolescent health literacy in general through a school-based health literacy intervention with a mixed-method design, combining quantitative and qualitative approaches to measure program effectiveness and understand the dynamics of implementation in schools. Meanwhile, the research by Nafisah et al., [39] specifically focused on improving reproductive health literacy among adolescent girls in Islamic boarding schools through peer education, which leverages peer influence to shape behavior and knowledge. Both studies share similarities in using education-based interventions to improve health literacy, but differ in their focus population and implementation methods. This study takes a different approach by examining the effect of classroom-based reproductive health education on junior high school students in a public school environment using a pre-experimental one-group pretest-posttest design. This differs from the comprehensive scale of the research by Khanal et al. [38] and the research by Nafisah et al. [39] which is oriented towards a peer approach in Islamic boarding schools, this study focuses on providing direct education by facilitators to early adolescents in formal school settings, so as to fill the knowledge gap regarding the effectiveness of brief face-to-face interventions on improving reproductive knowledge in different age groups and school environments.

The novelty of this research lies in its focus and approach, which examines the effectiveness of face-to-face reproductive health education delivered in a contextual and interactive manner for early adolescents (students in grades VII–VIII) in public junior high schools. The urgency stems from the high vulnerability of early adolescents to misinformation in the digital era, the limited access to accurate reproductive information at the elementary and junior high school levels, and the potential health and social consequences such as teenage pregnancy, the spread of sexually transmitted infections, and risky behavior. This study aims to measure the impact of school-based reproductive health education interventions on improving early adolescent knowledge and to formulate practical recommendations for the development of reproductive education programs that are culturally relevant, measurable, and effectively implemented in formal school settings.

## 2. RESEARCH METHOD

### 2.1. Research Design

This research is quantitative, with the research design using the Pre-experimental design method with one group pre-test post-test design because random assignment was not carried out on the research subjects [40], [41]. Random assignment is the random selection of research participants who will be placed in different groups, such as the experimental group and the control group [42], [43].

The one group pre-test and post-test research design can be described as in Figure 1.

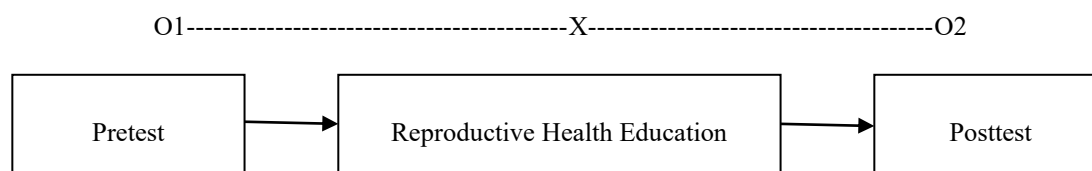


Figure 1. Research Design

Information:

O1 : measuring the level of knowledge of respondents by filling out a questionnaire

X : provide action in the form of health education

O2 : measure the level of knowledge of respondents by filling out the questionnaire again

### 2.2. Population and Sample

Population is a generalization area consisting of: objects/subjects that have certain qualities and characteristics determined by the researcher to be studied and then conclusions drawn [44], [45]. The population in this study were students who were included in the early adolescent group, namely students in grades VII and VIII.

A sample is a subset of a population that has a specific number and characteristics that represent the entire population [46], [47]. In this study, the sample was determined based on inclusion criteria, namely eighth-grade students who were willing to be respondents by signing an informed consent form and participating in the complete health education activities, including the pretest and posttest. Meanwhile, exclusion criteria included students who were unwilling to be respondents, were absent during the study, or did not participate in the entire health education activities, particularly the posttest.

### 2.3. Sampling Techniques

The research sample was taken using the convenience sampling technique, a sampling method used by researchers when random sampling is not possible. The reason for the researcher using a convenience sample is because the school only gave the researcher permission to take samples from one class. The sample was obtained by selecting 30 participants from class VIII 4, but because 6 people were absent when the health education was carried out, the number of respondents that could be taken was 24 people.

### 2.4. Research Instruments

The research instrument used to collect data in this study was a questionnaire [48], [49]. Two types of questionnaires were used: Questionnaire A and Questionnaire B. Questionnaire A asked about respondents' demographic data, such as age, gender, and grade. Meanwhile, Questionnaire B consisted of 21 questions designed to measure students' knowledge of reproductive health. All questions in the questionnaire were systematically structured according to the research objectives.

The questions in Questionnaire B were structured based on the material outlined in the literature review. Students' answers were then assigned a weighted score. The scores were based on the total score of correct answers. Each correct answer in Questionnaire B was given a score of 1, and each incorrect answer was given a score of 0.

### 2.5. Data Analysis Techniques

The purpose of the bivariate analysis in this study was to diagnose data and test hypotheses between two variables, namely health education and the level of adolescent knowledge about reproductive health at Ruhama Islamic Middle School, Ciputat. This analysis was conducted using an inferential analysis technique with a paired numerical comparative hypothesis test, because the data used were on an interval scale and obtained from two measurements in the same group. The statistical test used was the paired t-test, which aims to compare the average of two variables from the same sample group [50], [51]. Criteria for applying the paired t-test include: the data must be on an interval or ratio scale, normally distributed, and the variance between the data may be the same or different. However, if the data is not normally distributed or does not meet the requirements of the t-test, then the alternative used is the Wilcoxon test.

### 3. RESULTS AND DISCUSSION

#### 3.1. Normality Test

The normality of the results of adolescent knowledge about reproductive health before and after health education can be seen in Table 1.

Table 1. Distribution of Normality Results of Adolescents' Knowledge about Reproductive Health Before and After Health Education

Before			After		
Statistic	Df	Sig.	Statistic	Df	Sig.
.971	24	.683	.867	24	.005

This normality test uses the Shapiro-Wilk test because this test is more appropriate when used to test normality in samples less than 50. Based on the results of the normality test above, it can be concluded that the data after the intervention is not normally distributed because  $p = 0.05$  while the data before the intervention is normally distributed  $p > 0.05$ . The conclusion is that this study cannot use the paired t-test analysis test but uses the Wilcoxon test as explained previously that the Wilcoxon test is used if the paired t-test requirements are not met.

#### 3.2. Differences in knowledge about reproductive health before and after health education

From the results of the data analysis, differences in knowledge levels before and after health education were provided using the two-tailed Wilcoxon test. One tail is used when the researcher already knows the direction of the hypothesis, whether the effect is good or bad, positive or negative, while two tails are used when the researcher does not yet know the direction of the hypothesis. This study used two tails because the researcher formulated the hypothesis "there is an effect of health education on the level of adolescent knowledge about reproductive health at Ruhama Islamic Middle School, Ciputat."

The results of the analysis of differences in knowledge about reproductive health before and after intervention in the form of health education can be seen in Table 2.

Table 2. Differences in Level of Knowledge about Reproductive Health Before and After Health Education

Before – After Health Education	
Z	-1.955 <sup>b</sup>
Asymp. Sig. (2-tailed)	.051

The alpha value in this study is 0.05. The data in the table above shows a value of Asymptotic Sig.  $0.051 > \alpha 0.05$ , so it can be concluded that there is no difference in the level of knowledge about reproductive health before and after health education.

Based on the results obtained in this study, the average student knowledge about reproductive health during the pretest was 17.21 with a standard deviation of 1.865. During the posttest, the average student knowledge was 18.13 with a standard deviation of 2.894. From this description, we can obtain information that the difference in mean values between the pretest and posttest was 0.92. The Wilcoxon test results obtained a value of Asymp. Sig. = 0.051, this value is greater than the  $\alpha$  (alpha) value of 0.05. Thus, it can be concluded that there is no significant difference in student knowledge between before and after the intervention.

The analysis showed an increase in the mean knowledge score from 17.21 to 18.13 (a difference of 0.92 points), but the Wilcoxon test yielded a p-value of 0.051, indicating that the groups did not show a statistically significant difference at the  $\alpha = 0.05$  level. Nevertheless, the effect size indicated a noteworthy signal of change: with  $Z = -1.955$  and  $N = 24$ , the standardized effect size  $r$  was calculated as  $|Z|/\sqrt{N} \approx 0.40$ , which is considered a medium effect according to Cohen's guidelines. An alternative calculation using the pooled SD yielded a Cohen's  $d$  estimate of  $\approx 0.38$  (approximate; since the exact pairwise  $d$  requires the SD of individual differences). In other words, although the p-value is slightly above the significance threshold, the effect size indicates that the intervention may have had a moderate practical impact on participants' knowledge—but the small sample size and relatively high variability prevented this finding from reaching statistical significance.

Practically, a 0.92-point increase needs to be interpreted in the context of the instrument and the scoring scale: if the instrument is sensitive and the point gain represents a change in essential concepts, this increase may be meaningful for educational practice. However, if the instrument is less sensitive or the maximum score is relatively small, the change may be less clinically/educationally relevant. Therefore, it is important to assess practical significance beyond the p-value alone—for example, by examining the percentage of respondents who moved categories (e.g., from low to adequate) or their level of mastery of each core topic after the intervention.

Several factors likely explain why the results did not reach significance: (1) The small sample size ( $n = 24$ ), which reduces statistical power and increases the probability of a Type II error; (2) The relatively short duration and intensity of the intervention may not be sufficient to modify embedded knowledge; (3) Facilitators who are unfamiliar or poorly trained may reduce the effectiveness of the delivery—interpersonal relationships

influence the receptivity of the material, particularly in early adolescents; (4) Variations in the quality of questionnaire completion (self-report bias, desirability), as well as the potential for a ceiling effect if some participants already have high prior knowledge; (5) Measurement instruments: The validity and sensitivity of the questionnaire to short-term changes need to be evaluated and, if necessary, improved.

Based on the above analysis, several practical implications are worth highlighting. For school practice: the educational format should be extended or conducted over several repeated sessions, involving classroom teachers or figures closer to the students, and combining interactive methods with practical activities (group discussions, role-plays, digital modules). For program policy: consider training facilitators to ensure more consistent delivery and implement fidelity monitoring mechanisms (checking adherence to the delivered material).

The limitations of the study need to be explicitly stated in the discussion: this study was pre-experimental without a control group, the sample size was limited to one classroom/school, thus limiting generalizability, the measurement instruments may not have been tested for reliability/factoring in the early adolescent context, and there was no behavioral outcome measure (only knowledge). These limitations explain why the findings should be viewed as preliminary evidence that requires further verification.

For further research, I recommend the following steps: (1) conduct a pre-registration sample size calculation to ensure the study has a power of  $\geq 0.8$ ; (2) use an experimental or quasi-experimental design with a control group and randomization, if possible; (3) increase the duration of the intervention and conduct follow-up measurements to assess knowledge retention; (4) use standardized instruments and reliability tests (Cronbach's alpha) and include indicators of categorical change (responder analysis); (5) consider mixed-methods approaches—add interviews/focus group discussions to understand participants' experiences and mechanisms of change. (6) Consider alternative delivery models (e.g., peer education vs. teacher vs. external facilitator) and test their relative effectiveness.

By clarifying statistical interpretations (combining p-values and effect sizes), acknowledging limitations, and recommending methodological improvements and practical options for implementation, the discussion will be academically more robust and more useful to educational policymakers and continuing researchers.

#### 4. CONCLUSION

The results of the study indicate that school-based reproductive health education provided in a single session to junior high school students did not result in a statistically significant increase in knowledge ( $p = 0.051$ ), despite a 4.4% increase in average scores. This finding indicates that brief interventions tend to have a limited impact on improving knowledge among early adolescents. However, educational programs still have strategic value as promotive and preventive efforts to equip adolescents with accurate reproductive health information. The development of more intensive, iterative intervention models involving participatory methods is needed to produce more meaningful and sustainable knowledge gains.

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