A Comparison of Educational Methods—Lecture (PPT) versus Visual—Regarding Reproductive Health Knowledge among Adolescents at SMK Bhakti Asih Purwakarta

Dita Humaeroh[1*], Tia Suciati[2], Husnul Chotimah[3]

[1]Dosen Prodi Sarjana Terapan Kebidanan, Politeknik Bhakti Asih Purwakarta, Indonesia
[2,3]Prodi Pendidikan Profesi Bidan, Politeknik Bhakti Asih Purwakarta,
Jawa Barat, Indonesia
[*] Corresponding author:
Email: ditahumaeroh@polbap.ac.id

Abstract.
Reproductive health, like health in general, is a fundamental human right. Achieving it requires accurate and comprehensive knowledge regarding reproductive health. Such knowledge is acquired through various channels, one of which is education. This study employed a quasi-experimental design—specifically a two-group pretest-posttest design—involving 76 respondents selected via total sampling. The experimental group utilized visual media, while the control group received instruction through lectures (PowerPoint presentations).The results indicate a significant difference between the use of visual media (video) and lectures (PowerPoint) in improving reproductive health knowledge among adolescents. The group receiving education via visual media achieved higher knowledge scores compared to the lecture group, with a p-value of 0.016 (< 0.05). Thus, the use of visual media is more effective than the lecture method in enhancing reproductive health knowledge among adolescents. These findings support the use of visual media to improve adolescents' knowledge of reproductive health.
Keywords: Knowledge, Adolescents, Lecture Method (PowerPoint), Visual Media (video).

I. INTRODUCTION

Reproductive health, like health in general, is a fundamental human right. Achieving it requires accurate and comprehensive knowledge regarding reproductive health. Such knowledge is acquired through various channels, with education being the most important and effective means.

Reproductive health knowledge is essential for the public, particularly for children and adolescents who require education on the subject. A 2010 World Health Organization (WHO) survey indicated that adolescents (aged 10–19) constitute one-fifth of the global population, with 83% living in developing countries. Adolescence is a period of heightened vulnerability to reproductive health issues, such as early pregnancy, unsafe abortion, sexually transmitted infections (STIs)—including HIV—sexual harassment, and rape. It is hoped that reproductive health education can help prevent these problems.

Adolescents are defined as individuals in the 10–19 age range. Data from UNICEF indicates there are 1.2 billion adolescents worldwide, making them a significant segment of the global population. Indonesia alone had an adolescent population of 74.93 million according to the 2020 census. The size of this demographic underscores the need to prioritize adolescents, as this is a crucial developmental stage and they represent the future of the nation (UNICEF, 2019).

The issues facing adolescents today are complex and concerning. This is evidenced by the persistently low level of knowledge among adolescents regarding reproductive health. Only 29% of adolescent girls and 32.3% of adolescent boys are aware of the fertile window. Meanwhile, 49.5% of girls and 45.5% of boys are aware of the risk of pregnancy resulting from a single sexual encounter (BPS, 2018). Reproductive health risks are influenced by various interconnected factors, one of which is knowledge. Knowledge regarding adolescent reproductive health encompasses an understanding of the anatomy and physiology of reproductive organs; it does not teach sexual techniques but rather instructs adolescents on how to protect themselves from risky and unhealthy behaviors (BKKBN, 2018).

Comprehensive sexuality education is an educational approach specifically designed to provide adolescents with complete, accurate, and scientifically based information covering various aspects of sexual and reproductive life. This education is crucial because adolescents undergo significant physical, emotional,

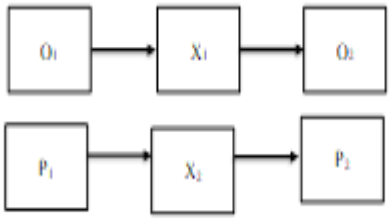
and social changes; consequently, they require appropriate guidance and information to navigate this period in a healthy, safe, and responsible manner.

Health education utilizing videos has been shown to increase knowledge; for instance, research conducted by Ranni (2020) demonstrated that the implementation of audiovisual methods at SMKN 3 Denpasar improved students' knowledge of adolescent reproductive health, shifting their knowledge level from "sufficient" prior to the intervention to "good" following the intervention.

II. METHODS

This study employs a quasi-experimental research design. Quasi-experimental research involves an intervention, impact measurement, and experimental units, but it does not utilize random assignment to establish comparisons for inferring changes caused by the intervention; thus, this study falls under the quasi-experimental category. Specifically, the study utilizes a "two-group pretest-posttest design."

The design is a pre-experimental one featuring a pre-test and a post-test, involving two observations: one prior to the intervention (pre-test) and one following the intervention (post-test). The study includes two intervention groups: a group receiving an educational video on reproductive health and a group receiving a lecture on reproductive health.



Scheme 4.1 Research Design

Legend:

O1 : Knowledge prior to video presentation (pre-test)
X1 : Video presentation
O2 : Knowledge after video presentation (post-test)
P1 : Knowledge prior to reproductive health lecture (pre-test)
X2 : Reproductive health lecture
P2 : Knowledge after reproductive health lecture (post-test)

This study was conducted over a period of approximately one month (four weeks), specifically from November to December 2025, at SMK Bhakti Asih Purwakarta. The study population consisted of 76 students from grades X and XI at SMK Bhakti Asih Purwakarta. The sampling technique employed was non-probability sampling using the total sampling method, encompassing all 76 students (grades X and XI). Data collection was carried out via questionnaires distributed to the students. The obtained data were analyzed to address the research question regarding the comparative effectiveness of educational videos versus lecture methods on students' knowledge of reproductive health. Data processing involved two stages of analysis: univariate and bivariate. Univariate analysis aimed to describe the characteristics of each variable under study, yielding frequency distributions, percentages, and mean values. In this study, univariate analysis was used to describe changes in students' knowledge levels before and after the intervention (pre-test and post-test), based on measurements using the Davey Score Scale.

Bivariate analysis was conducted to compare the effectiveness of educational videos and lecture methods regarding students' knowledge of reproductive health. Statistical tests were selected based on data type and distribution: the paired t-test (or a non-parametric equivalent such as the Wilcoxon test) was used to compare pre-test and post-test scores within each group, while the independent t-test (or a non-parametric alternative such as the Mann-Whitney test) was used to compare results between the intervention groups.

Through this bivariate analysis, researchers can assess differences in adolescents' knowledge scores before and after the intervention and determine which intervention is more effective.

III. RESULT AND DISCUSSION

1. Analisis Univariat

Univariate analysis was conducted to describe the characteristics of each research variable. In this study, univariate analysis was used to describe respondent characteristics, specifically age and gender. The data are presented in the form of frequency distributions and percentages.

a. Respondent Characteristics by Age

Table 4.1 Distribution of Respondent Characteristics by Age at SMK Bhakti Asih Purwakarta

No	Usia	Frekuensi	Persentase (%)
1	15-16 Year	47	61.8
2	17-18 Year	29	38.2
	Total	76	100,00

Based on Table 4.1, it is evident that among the 76 respondents, the majority fell within the 15–16 age group, totaling 47 individuals (61.8%), while 29 respondents (38.2%) were aged 17–18.

Adolescents aged 17 tend to be more open to scientific information compared to younger age groups, for whom reproductive health education is often still considered taboo. With an appropriate educational approach—such as the use of audiovisual media—information regarding reproductive health can be conveyed more easily and without causing awkwardness. Providing education on reproductive health and sexually transmitted diseases at age 17 serves as an effective preventive measure to enhance adolescent awareness and understanding. With adequate knowledge, they can protect themselves against potential future health risks. At this age, adolescents tend to be more receptive to and capable of grasping information, thereby optimizing the knowledge-acquisition process. This aligns with research by Veftisia (2023), which indicates that age is one of the factors influencing the improvement of respondents' knowledge.

A study conducted by Nurhayati et al. (2021) in Indonesia found that adolescents in the 16–18 age range possessed a higher level of knowledge regarding reproductive health compared to younger groups. Age was identified as a key determinant of readiness to receive education and apply that knowledge in daily life. Furthermore, research by Santrock (2019) in the book *Adolescence* reveals that individuals in late adolescence (ages 17–19) tend to be more open to discussing sensitive topics—including reproductive health—due to their more mature cognitive and social development. This renders educational interventions more effective at this stage.

a. Respondent Characteristics by Gender

Table 4.2 Distribution of Respondent Characteristics by Gender at SMK Bhakti Asih Purwakarta

No	**Gender**	**Frequency**	Persentase (%)
1	**Female**	70	92.1
2	Male	6	7.9
	Total	76	100,00

Based on Table 4.2, it is evident that among the 76 respondents, the majority were female (70 individuals or 92.1%), while males accounted for 7.9%.

These findings are supported by research conducted by Loho (2021), which states that gender is a factor influencing risk-taking behavior among adolescents. Furthermore, differences in characteristics between males and females play a role; females generally exhibit feminine traits—such as being more passive, less

open, and less self-confident—and tend to be reluctant to discuss sexual issues or to adopt a gentle demeanor.

Research conducted by Pratiwi, Lestari, and Putri (2020) in Surabaya found that female high school students possessed a higher level of knowledge regarding reproductive health compared to their male counterparts. Another study by Rahmawati and Yuliana (2018) in Yogyakarta reported similar results: female students demonstrated better knowledge of reproductive health than male students, and gender characteristics influenced behaviors related to seeking information and discussing reproductive health issues.
According to Erik Erikson's theory of psychosocial development, adolescents are in the identity-seeking stage (identity vs. role confusion), during which they begin to develop a self-concept that includes understanding gender roles and behaviors appropriate to their sex. This influences how male and female adolescents process and accept information regarding reproductive health.

Additionally, Social Gender Theory posits that social norms and roles associated with gender can influence an individual's behavior and knowledge. Females, who tend to be associated with feminine traits such as passiveness and gentleness, are often less open to discussing sexual issues, which impacts their reproductive health information-seeking behavior. Conversely, males—associated with masculine traits—may be more open, though their knowledge levels can vary depending on their experiences and social environment.

a. Characteristics of Knowledge Prior to (Pretest) Intervention

Table 4.3 Frequency Distribution of Knowledge Characteristics Prior to (Pretest) the Provision of Videos and Lectures at SMK Bhakti Asih Purwakarta

No	Knowledge	Video		Ceramah	
		Frequency	Persentase (%)	Frequency	Persentase (%)
1	Not enough	10	26.3	6	15.8
2	Enough	25	65.8	27	71.1
3	Good	3	7.9	5	13.2
	Total	38	100,0	38	100,0

Berdasarkan Tabel 4.6, perolehan karakteristikPengetahuan sebelum (pretest) diberikan edukasi melalui video sebagian besar berada di kategori cukup sebanyak 25 orang (65.8%), kategori kurang sebanyak 10 orang (26.3%) dan kategori baik sebanyak 3 orang (7.9%). Sedangkan perolehan sebelum (pretest) diberikan ceramah, sebagian besar berada di kategori cukup sebanyak 27 orang (71.1%), kategori kurang sebanyak 6 orang (15.8%) dan kategori baik sebanyak 5 orang (13.2%).

a. Karakteristik Pengetahuan Sesudah (Posttest) Intervensi.

Tabel 4. 4 Distribusi Frekuensi Karakteristik Pengetahuan Sebelum *(Pretest)* Diberikan video dan ceramah Di SMK Bhakti Asih Purwakarta

No	Pengetahuan	Video		Ceramah	
		Frequency	Persentase (%)	**Frequency**	Persentase (%)
1	Kurang	13	34.2	5	13.2
2	Cukup	17	44.7	18	47.4
3	Baik	8	21.1	15	39.4
	Total	38	100,00	38	100,00

Based on Table 4.4, the post-test knowledge levels following video-based education showed that the majority of participants fell into the "fair" category (17 individuals or 44.7%), followed by the "poor" category (13 individuals or 34.2%) and the "good" category (8 individuals or 21.1%). Meanwhile, following the lecture-based intervention, the majority of participants fell into the "fair" category (18 individuals or

47.4%), followed by the "poor" category (5 individuals or 13.2%) and the "good" category (15 individuals or 39.4%).

2. Normality test

Following the univariate analysis, a bivariate analysis was conducted to determine the relationships or differences between the research variables. A normality test was performed as a prerequisite for the bivariate analysis to determine whether the knowledge score data followed a normal distribution. The normality test was conducted using the Shapiro-Wilk test with the aid of SPSS software.

Table 4.5 Normality Test

Shapiro Wilk			
Indikator	N	Sig.	Description
Pretest Lecture (PPT)	38	0,221	Normal
Pretest Visual (Video)	38	0,246	Normal
Posttest Ceramah (PPT)	38	0,357	Normal
Posttest Visual (Video)	38	0,307	Normal

Based on the Shapiro-Wilk normality test results in Table 4.5, the decision-making criterion is that if the significance value (p-value) is greater than 0.05, the data is considered normally distributed. In the Lecture group, the Knowledge scores showed a p-value of 0.220 (>0.05) before the intervention (pretest) and 0.357 (>0.05) after the intervention. This indicates that the Knowledge score data for the Lecture group was normally distributed both before and after the intervention. Meanwhile, in the Visual (video) group, the Knowledge scores had a p-value of 0.246 (>0.05) before the intervention and 0.307 (>0.05) after the intervention. Thus, the data for the Visual (Video) group was also normally distributed. These results demonstrate that the Knowledge score variables in both intervention groups met the assumption of normality. Therefore, bivariate analysis could proceed using parametric tests. A Paired Samples T-Test was used to examine the difference in scores before and after the intervention within each group, while an Independent Samples T-Test was used to compare effectiveness between the groups (Visual and Lecture).

2. Bivariate Analysis

a. Paired Samples T-Test

Table 4.6 Effect of Visual Media (Video) on Adolescent Knowledge at SMK Bhakti Asih Purwakarta

Skor	*N*	*Mean*	*Std. Deviasi*	*Min.*	*Max*	*p-value*
Pretest	38	10.55	1.506	7	13	0,002
Posttest	38	11.05	1.078	9	13	

Based on the analysis of Table 4.6, data from 38 respondents regarding adolescent knowledge scores prior to the visual (video) intervention showed a mean score of 10.55 (standard deviation: 1.506), with a minimum score of 7 and a maximum of 13. Following the visual intervention (post-test), the mean score was 11.05 (standard deviation: 1.078), with a minimum score of 9 and a maximum of 13. Statistical analysis yielded a p-value of 0.002 (< 0.05); thus, it can be concluded that the visual (video) intervention had a significant effect on adolescent knowledge at SMK Bhakti Asih Purwakarta.

These findings align with research conducted by Fitriani et al. (2019) in Banda Aceh, which reported a significant increase in adolescent knowledge following reproductive health education delivered via the lecture method. Research by Wahyuningsih & Rochmawati (2017) yielded similar results among high school students in Yogyakarta, where the lecture method proved effective in enhancing reproductive health knowledge.

Theoretically, the success of the lecture method in improving knowledge is supported by cognitive learning theory, which emphasizes the importance of conceptual understanding gained through direct

explanations from experts or educators. This method also enables students to ask questions and discuss material they do not yet understand, thereby making the learning process more meaningful.

Table 4.7 Effect of the lecture method on adolescent knowledge at SMK Bhakti Asih Purwakarta

Skor	*N*	*Mean*	*Std. Deviasi*	*Min.*	*Max*	*p-value*
Pretest	38	9.55	1.537	6	14	0,021
Posttest	38	9.55	2.140	6	13	

Based on the analysis of Table 4.7, data from 38 respondents regarding adolescent knowledge scores prior to the intervention (pre-test) using the lecture method (PowerPoint/PPT) showed a mean score of 9.55 with a standard deviation of 1.537, a minimum score of 6, and a maximum score of 14. Following the lecture (PPT) intervention (post-test), the mean score was 9.55 with a standard deviation of 2.140, a minimum score of 6, and a maximum score of 13. Statistical test results yielded a p-value of 0.021 (< 0.05); thus, it can be concluded that the PPT medium had a significant influence on the knowledge of adolescents at SMK Bhakti Asih Purwakarta.

These research results are supported by the findings of Djannah et al. (2020), who stated that the use of audiovisual media contributes significantly to increasing adolescent knowledge regarding sexual and reproductive health.

The increase in respondents' knowledge occurred because they acquired information through education provided by the researcher concerning adolescent reproductive health and sexually transmitted infections. With this information, adolescents could deepen their understanding, which ultimately helps reduce cases of sexually transmitted infections. This aligns with the theory proposed by Notoatmodjo (2012), stating that health education is a planned effort to influence individuals to gain knowledge after participating in a health education program. Further support for this is found in a study by Veftisia (2023), which demonstrated a relationship between health education and adolescent knowledge regarding sexually transmitted infections (STIs). Another study (Sulastri & Astuti, 2020) also revealed a significant influence of health education on improving adolescent knowledge and attitudes regarding reproductive health and sexually transmitted infections following participation in a health education program.

a. Independent Samples T-Test

Table 4.8 Comparison of the effectiveness of lecture and visual methods

Kelompok Intervensi	Mean	Sum of Ranks	Sig.(2-tailed)
Ceramah (PPT)	32.50	1235.00	0,016
Visual (Video)	44.50	1691.00	

Based on the Independent Samples T-test results in Table 4.11, the post-test knowledge score yielded a p-value of 0.016 (less than the alpha level of 0.05). This indicates that the null hypothesis (Ho) was rejected and the alternative hypothesis (Ha) was accepted, signifying a significant difference in effectiveness between the lecture method using PowerPoint (PPT) and the use of visual media (video). The Visual (Video) group achieved a higher mean score (44.50) compared to the Lecture (PPT) group (32.50); this demonstrates that the group receiving the video-based intervention possessed a higher level of knowledge than the group receiving the PPT-based lecture, thereby indicating that visual media (video) is significantly more effective than the lecture method (PPT). Research conducted by Djannah et al. (2020) supports these findings, demonstrating the vital role of audiovisual media in enhancing adolescents' knowledge regarding reproductive health. Similarly, a study by Pragita et al. (2018) showed that reproductive health education utilizing audiovisual media significantly improved adolescent knowledge compared to conventional teaching methods. Furthermore, Sukmaningsih et al. (2018) reported that the use of short films as audiovisual media was more effective in improving adolescents' knowledge, attitudes, and practices concerning reproductive health.

IV. CONCLUSION

1. The research results indicate that among the 76 respondents, the majority were aged 15–16 years (47 individuals or 61.8%), while 29 respondents (38.2%) were aged 17–18 years.
2. The research findings reveal that of the 76 respondents, the majority were female (70 individuals or 92.1%), while the remainder were male (7.9%).
3. Data analysis shows that the vocational high school students' knowledge level prior to the lecture method intervention had a mean score of 9.55 (standard deviation: 1.537), whereas after the intervention, the mean score was 9.55 (standard deviation: 2.140). The statistical test yielded a p-value of 0.021 (<0.05), leading to the conclusion that the lecture method has a significant influence on the adolescents' knowledge.
4. Data analysis shows that the vocational high school students' knowledge level prior to the visual method (video) intervention had a mean score of 9.55 (standard deviation: 1.506), whereas after the intervention, the mean score was 11.05 (standard deviation: 1.078). The statistical test yielded a p-value of 0.002 (<0.05), leading to the conclusion that the visual method (video) has a significant influence on the adolescents' knowledge.
5. The research yielded a p-value of 0.016 (<0.05), indicating a significant difference in effectiveness between the lecture method (using PowerPoint/PPT) and the visual media method (video). The Visual (Video) group had a higher mean score (44.50) compared to the Lecture (PPT) group (32.50); this demonstrates that the group receiving the video-based intervention achieved a higher level of knowledge than the group receiving the PPT-based lecture. Thus, visual media (video) is significantly more effective than the lecture method (PPT).

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