# The Effectiveness of Health Education Through Booklet and PowerPoint Media on Adolescents' Knowledge of the Impacts of Free Sex

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***Abstract.***
*Background: Unprotected sex among adolescents remains a public health problem because it increases the risk of unintended consequences (KTD), sexually transmitted infections, and various psychosocial impacts. The low level of adolescent knowledge regarding the impact of unprotected sex is one of the factors that drives the need for health education. Appropriate educational media is expected to be able to increase adolescent knowledge more optimally. Method: This study used a quantitative method with a pretest-posttest control group design. Three of the four eleventh grade classes were assigned to the booklet intervention group, PPT, and the control group. Data analysis used the Wilcoxon, Kruskal-Wallis, and post-hoc Mann-Whitney tests with a significance level of 5%. Results: Adolescent knowledge increased significantly in the booklet group (Z = -4.884; p = 0.000) and the PPT group (Z = -2.927; p = 0.003), while the control group did not show any significant changes (Z = -1.764; p = 0.078). The Kruskal-Wallis test showed a significant difference in knowledge increase between the three groups (H = 41.078; p = 0.000), with a mean rank of 73.82 for the booklet group, 44.14 for the PPT group, and 29.95 for the control group. Conclusion: Health education through booklets and PowerPoint media is effective in increasing adolescents' knowledge about the impact of casual sex. Booklets are proven to be more effective than PowerPoint media, so they are recommended as reproductive health education media for adolescents.*
***Keywords:*** *Health education, booklets, PowerPoint, adolescent knowledge, free sex and reproductive health..*

## I. INTRODUCTION

Unprotected sex among adolescents is a major cause of increasing morbidity and transmission of sexually transmitted infections (STIs). Adolescents who initiate sexual activity without adequate knowledge and protective skills are highly vulnerable to a variety of subsequent negative consequences.1

Nationally, data from the 2023 Indonesian Health Survey (SKI) reported that 4.2% of the adolescent population experienced their first pregnancy at an early age, namely the 10–14 year age group, with the highest incidence (92.1%) in the 15–19 year age group. The National Population and Family Planning Agency (BKKBN) recorded the prevalence of coital initiation in adolescents aged 15–19 years reaching 59% for adolescent girls and 74% for adolescent boys. This clinical fact is increasingly evident in Lampung Province, where the incidence of Unplanned Pregnancy (KTD) due to casual sex reached 48.1% in adolescents aged 15–19 years.2,3

A preliminary study at MAN 1 Tulang Bawang Barat, Lampung, confirmed that dating dynamics have triggered various complications, including cases of unintended consequences. Twenty-two of 30 students (73.3%) were involved in dating relationships with potentially widespread physical contact. Initial questionnaire results indicated that seven of the ten students (70%) had low knowledge scores, although the majority (25 of 30, or 83%) recognized the importance of sexual health education.

The majority of students considered PPT media less interesting due to suboptimal visualization quality, technical constraints, and the lack of distribution of PPT materials. Booklets as informative and portable pocket books can facilitate more intensive independent learning; preliminary interviews showed that 20 students (66.67%) chose booklets because of the ease and flexibility of the medium.4,5,6,7

This study aims to determine the differences in health education through booklets and PowerPoint media on adolescents' knowledge about the impact of free sex.

Casual sex is sexual intercourse between men and women without the bonds of marriage. Casual sex can have psychological, physiological, and physical impacts, as well as lead to various sexually transmitted infections (STIs) in adolescents. The impact of risky sexual behavior on adolescents is not limited to increased incidence of STIs and unplanned pregnancies, but also affects overall reproductive health, including complications of teenage pregnancy, infertility due to untreated infections, mental health disorders, and impaired educational and social development.1

Health education is the process of changing habits, attitudes, and knowledge in individuals to achieve health goals. Sex education does not teach how to have sex, but rather provides adolescents with age-appropriate understanding of sexual function, pubertal changes, the risks of sexual behavior, and reproductive health. Accurate and positive information about sexual health is needed to help adolescents control themselves and avoid risky sexual behavior.4,5

Booklets allow for narrative, structured, and detailed presentation of material, allowing them to be used independently without electronic devices, electricity, or supporting applications. In contrast, PowerPoint is an application that can convey material in the form of text, images, photos, color, audio, video, and animation, thus facilitating the visual delivery of information. The differences in the characteristics of these two media form the basis for comparing the effectiveness of health education in this study.6,13

## II. RESEARCH METHODS

This research was conducted on March 9, 2026. The type of research used was quantitative experimental with a Pretest–Posttest Control Group Design. The sampling technique used cluster random sampling through randomization of four grade XI classes; three classes were involved in the study. The study involved 98 students divided into booklet groups (n=33), PPT (n=33), and control (n=32).

The data used were derived from primary data in the form of responses to a knowledge questionnaire on the impacts of casual sex distributed before and after the intervention. A booklet was developed as a health education tool on the impacts of casual sex on adolescents, covering the definition of casual sex, causal factors, the impacts of casual sex, sexually transmitted infections, unwanted pregnancies, and prevention efforts.

The study population was the eleventh grade students of MAN 1 Tulang Bawang Barat. The sample was determined through randomization of four eleventh grade classes and three classes selected as the research group, while the unselected classes were not involved. Each class was divided into one group, namely the booklet media intervention group, the PowerPoint media intervention group, and the control group. Respondents who met the criteria numbered 98 students, consisting of 33 students in the booklet group, 33 students in the PPT group, and 32 students in the control group.

The independent variable was health education through booklets and PowerPoint presentations, while the dependent variable was adolescents' knowledge about the impacts of casual sex. Knowledge was measured using a 17-question questionnaire with true or false answers. Data were collected through a pretest, health education provided to the intervention group, and a posttest. Data were processed using Microsoft Excel and IBM SPSS Statistics version 27. Bivariate analysis used the Wilcoxon Signed Rank Test, Kruskal-Wallis, and post-hoc Mann-Whitney tests with a significance level of 5%.

The validity of the booklet media was assessed through expert judgment by three validators, including school guidance and counseling personnel, health workers, and health education media experts. The assessment covered aspects of content, language, presentation, and appearance. Data were analyzed using the Wilcoxon, Kruskal-Wallis, and post-hoc Mann-Whitney tests with a 5% significance level.8

The research was conducted after obtaining approval from the Health Research Ethics Commission of the Faculty of Nursing and Health Sciences, Muhammadiyah University of Semarang No. 030/KE/02/2026.

## III. RESULTS AND DISCUSSION

### Booklet Media Eligibility

Based on the validity test results, the average Aiken's V value was 0.92, indicating that the booklet media was valid and suitable for use as a health education medium regarding the impact of casual sex on adolescents. Based on the reliability test results, the Cronbach Alpha value was 0.91, indicating that the booklet validation instrument was declared to have very good reliability. Based on the readability test results, the booklet media was declared easy to understand, interesting, and suitable for use as a health education medium in research.8

**Table 1. Results of the validator's assessment of the booklet media**

| Item | Validator 1 | Validator 2 | Validator 3 |
|---|---|---|---|
| Materials in accordance with health education objectives | 4 | 4 | 3 |
| The content of the material is in accordance with the topic of the impact of free sex | 4 | 4 | 4 |
| Language that is easy for teenagers to understand | 3 | 4 | 4 |
| Sentences used are communicative | 4 | 3 | 4 |
| The presentation of the material is systematically arranged | 4 | 4 | 4 |
| Images support the content of the material | 3 | 4 | 4 |
| Easy to read font size | 4 | 4 | 3 |
| Attractive color combination | 3 | 4 | 4 |
| Booklets are suitable for use as educational media | 4 | 4 | 4 |

**Table 2. Results of the validity test of Aiken's V media booklet**

| Item | Aiken's V value | Information |
|---|---|---|
| 1 | 0.89 | Valid |
| 2 | 1.00 | Very valid |
| 3 | 0.89 | Valid |
| 4 | 0.89 | Valid |
| 5 | 1.00 | Very valid |
| 6 | 0.89 | Valid |
| 7 | 0.89 | Valid |
| 8 | 0.89 | Valid |
| 9 | 1.00 | Very valid |

After validation, the booklet was revised according to the validator's suggestions, including grammatical improvements, font size adjustments and alignment, the addition of illustrations, and the simplification of medical terms to make them easier for adolescents to understand. The booklet contained more detailed descriptions than the PowerPoint presentation, as a result of improvements based on input from the expert validator. Additional materials were not included in the questionnaire development and therefore were not assessed in measuring respondents' knowledge levels.

**Table 3. Suggestions for improvement and follow-up of intervention media**

| Evaluation aspects | Corrector | Repair |
|---|---|---|
| Grammar | Validator 3 | Use language that is more flexible, straightforward, and easy to understand. |
| Letter alignment | Validator 1 | Use the same typeface for each title at the beginning of the page. |
| Adding illustrations | Validators 1 and 2 | Add an illustration of microbes to the page about sexually transmitted diseases that can occur. |
| Simplification of medical terms | Validator 2 | Add a glossary containing medical terms. |
| Additional material | Validator 2 | Add an explanation about sexually transmitted diseases. |

**Table 4. Booklet media suitability**

| Parameter | Results | Information |
|---|---|---|
| Aiken's V Average | 0.92 | Valid and proper |
| Cronbach Alpha | 0.91 | Very good reliability |
| Easy to read writing | 90% | Readability test |
| Easy to understand language | 88% | Readability test |
| Interesting picture | 85% | Readability test |
| Easy to understand material | 92% | Readability test |

**Respondent Characteristics**

The largest age group of respondents was 15–16 years old, with a total of 39 respondents. The dominant gender in this study was female, with a total of 68 respondents.

**Table 5. Respondent characteristics based on intervention and control groups (N=98)**

| Characteristics | Category | Booklet (n=33) | PPT(n=33) | Control(n=32) | Total |
|---|---|---|---|---|---|
| Age | <15 years | 7 (33.3%) | 7 (33.3%) | 7 (33.3%) | 21 (21.4%) |
| Age | 15–16 years | 13 (33.3%) | 14 (35.9%) | 12 (30.8%) | 39 (39.8%) |
| Age | >16 years | 13 (34.2%) | 12 (31.6%) | 13 (34.2%) | 38 (38.8%) |
| Gender | Man | 14 (46.7%) | 6 (20.0%) | 10 (33.3%) | 30 (30.6%) |
| Gender | Woman | 19 (27.9%) | 27 (39.7%) | 22 (32.4%) | 68 (69.4%) |

*Note: The percentages in the group column follow the category distribution in the research results table.*

**Knowledge Score Before and After Intervention**

The booklet group's mean knowledge score on the pretest was 8.88 with a standard deviation of 3, and increased to 14.79 with a standard deviation of 9 on the posttest. The PPT group showed a pretest mean of 8.92 and a posttest mean of 12.24, while the control group only changed from 8.78 to 9.28.

**Table 6. Knowledge scores before and after intervention**

| Group | Pretest mean ± SD (min–max) | Post-test mean ± SD (min–max) |
|---|---|---|
| Booklet | 8.88 ± 3 (2–14) | 14.79 ± 9 (10–18) |
| PPT | 8.92 ± 4 (1–14) | 12.24 ± 8 (8–17) |
| Control | 8.78 ± 3 (2–13) | 9.28 ± 4 (5–14) |

**Bivariate Analysis**

The distribution of knowledge scores in the booklet, PPT, and control groups was non-normal at both measurement times. Therefore, the data were analyzed using nonparametric tests. The baseline test showed no significant differences between the groups before the intervention, indicating that the initial scores for the three groups were equivalent.

**Table 7. Initial normality and equality tests between groups**

| Group | p pretest (Kolmogorov-Smirnov) | p post-test(Kolmogorov-Smirnov) | Information |
|---|---|---|---|
| Booklet | 0.040 | 0,000 | Not normally distributed |
| PPT | 0.001 | 0.021 | Not normally distributed |
| Control | 0.041 | 0.034 | Not normally distributed |
| Baseline pretest between groups | H = 1.228; df = 2 | p = 0.541 | No significant difference / equivalent |

**Table 8. Results of the Wilcoxon test of knowledge scores before and after measurement**

| Comparison | Z | p-value | Information |
|---|---|---|---|
| Post-test – pretest booklet | -4,884 | 0,000 | Different meaning |
| PPT post-test – pretest | -2,927 | 0.003 | Different meaning |
| Post-test – pretest control | -1,764 | 0.078 | No significant difference |

**Table 9. Differences in knowledge increase between groups using the Kruskal-Wallis test**

| Group | N | Mean rank | Kruskal-Wallis H | df | Asymp. Sig. |
|---|---|---|---|---|---|
| Booklet | 33 | 73.82 | 41,078 | 2 | 0,000 |
| PPT | 33 | 44.14 | 41,078 | 2 | 0,000 |
| Control | 32 | 29.95 | 41,078 | 2 | 0,000 |

**Table 10. Results of the Mann-Whitney post-hoc follow-up test**

| Group comparison | p-value | Information |
|---|---|---|
| Booklet with PPT | 0,000 | Different meaning |
| Booklet with controls | 0.014 | Different meaning |
| PPT with controls | 0.014 | Different meaning |

## IV. DISCUSSION

The results of the study showed that providing health education using educational media significantly increased adolescents' knowledge about the impacts of casual sex. Both booklets and PPT media were equally effective in improving respondents' knowledge after the intervention, while the control group showed no statistically significant changes. Reproductive health education for adolescents plays a crucial role in shaping healthy understanding, attitudes, and behaviors, thus contributing to both promotion and prevention of risky sexual behavior. 9

Interventions using booklets significantly increased adolescents' knowledge after receiving health education about the impacts of casual sex. This improvement occurred because booklets, as printed media, offer advantages such as systematic content, simple language, attractive visuals, and the ability to be read repeatedly as needed. Having the booklets readily accessible after the education process allows respondents to repeat the information, improving their retention and retention.

The results of this study are in line with research showing that reproductive health education through booklets is effective in increasing adolescents' knowledge and understanding of risky sexual behavior because the material can be studied again independently.10,11,12

Furthermore, the combination of text, illustrations, and brief explanations in the booklet makes it easier for adolescents to understand reproductive health material that is often considered sensitive or difficult to understand when presented verbally only. The booklet also provides respondents with the opportunity to learn independently at their own pace, thus optimizing information absorption. These advantages are reinforced by the evaluation results and improvements suggested by the validator in the booklet's development, resulting in a more relevant and systematically validated educational booklet.10,11,12

The intervention using PPT media also showed an increase in respondents' knowledge after the education was provided. PPT media can facilitate the process of conveying information through a more interactive combination of text, images, and visual displays, thereby increasing respondents' attention during the educational process. However, the increase in knowledge in the PPT group was not as significant as in the booklet group because PPT media tends to rely on the delivery process during the intervention and cannot be reviewed independently after the activity is completed.13,14,15

The control group showed an increase in knowledge despite not receiving direct health education intervention. This could be due to a pretest effect, where respondents became more interested in seeking information about casual sex after completing the initial questionnaire. Exposure to information from the school environment, social media, the internet, and discussions with peers can also indirectly influence this increase in knowledge. However, the increase in knowledge in the control group did not show a significant difference, suggesting that the more optimal increase in knowledge was still influenced by the health education intervention using educational media.

### Research Limitations

This study has several limitations. The study was conducted over a relatively short period of time, making it impossible to describe the sustainability of respondents' knowledge gains over the long term. The study's outcome measurements focused solely on knowledge, without assessing changes in adolescent attitudes or

behaviors regarding casual sex. The possibility of information exchange between groups could not be fully controlled because all respondents were in the same school environment.

## V. CONCLUSION

Health education using booklets and PowerPoint presentations effectively increased adolescents' knowledge about the impacts of casual sex. The booklet had the highest mean rank (73.82) compared to the PowerPoint presentation (44.14) and the control group (29.95). Further testing showed significant differences between the booklet and PowerPoint presentation, the booklet and control, and the PowerPoint and control groups. Therefore, the booklet is recommended as a more effective educational tool for increasing adolescents' knowledge about the impacts of casual sex.

## VI. THANK-YOU NOTE

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## REFERENCE

[1]. Rahadi D, Indarjo S. Free Sexual Behavior among Members of Semarang City Motorcycle Clubs in 2017. ***Journal of Health Education***. 2017;2(2):115–21.
[2]. Ministry of Health of the Republic of Indonesia. Indonesian Health Survey 2023. 2023.
[3]. BKKBN Lampung. Performance Report of the Representative of the National Population and Family Planning Agency of Lampung Province. Lampung: BKKBN Lampung; 2022.
[4]. Oktavia J, Mansur H, Yuliani I. The Effectiveness of Sex Education Method on the Attitude of Youth. Health Education. 2021;10(2):141–51.
[5]. Siregar E. The Influence of Health Education Through Magic Spin Wheel Media on Adolescents' Knowledge and Attitudes About Premarital Sex at SMP Negeri 06 Bengkulu City in 2020. Bengkulu: Poltekkes Kemenkes Bengkulu; 2021.
[6]. Saragih A, Andayani L. The Effect of Health Promotion with Video and Booklet Media on Students' Knowledge of Sedentary Behavior at MAN 1 Medan. J Heal Promot Behav. 2022;4(1):47.
[7]. Asyahara B. The Effect of Counseling on the Level of Knowledge and Attitude of Adolescents Regarding Sex Education at SMPN 23 Padang. Padang; 2025.
[8]. Aiken LR. Three coefficients for analyzing the reliability and validity of ratings. Educational and Psychological Measurement. 1985;45(1):131–42. doi:10.1177/0013164485451012.
[9]. World Health Organization. Adolescent health. 2023.
[10]. Noviawati I, Mufti IR. The Influence of Reproductive Health Education Through Booklets on Adolescents' Knowledge and Attitudes about the KRR TRIAD. Al-Insyirah Midwifery. 2025. doi:10.35328/kebidanan.v15i1.3106.
[11]. Hidayah MS, Ermiyani. Reproductive health knowledge through counseling with booklets for high school students in Bantul. ***Health Sciences and Pharmacy Journal***. 2023. doi:10.32504/hspj.v7i3.731.
[12]. Yunita RD, Nugraheni SA, Pradigdo SF. The Effect of Providing Reproductive Health Booklets on Cybersex. Indonesian Public Health Media. 2020;19(1):31–37. doi:10.14710/mkmi.19.1.31-37.
[13]. Wahyuni S, Arisani G. Audio Visual Media as a Means of Reproductive Health Education for Adolescents. ***Journal of Public Health Sciences***. 2022. doi:10.33221/jikm.v11i05.1778.
[14]. Suryani S, Septiyani KP, Aliyah N. Effectiveness of Attractive Visual Media-Based Reproductive Health Education on Reproductive Health Knowledge of Adolescent Girls. ***Journal of Midwifery***. 2025. doi:10.35872/jurkeb.v17i02.937.
[15]. Sahertian B, Latumenasse R. Adolescent Reproductive Health Booklet: Solutions to Address the Complexity of Adolescent Reproductive Health Problems. Global Health Science. 2019. doi:10.33846/ghs.v2i3.154.