

# An innovative educational media for reproductive health: The impact of the pillow t-shirt on knowledge among junior high school girl

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## ARTICLE INFO

## ABSTRACT

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Enhancing reproductive health knowledge among adolescents is crucial to prevent unwanted pregnancies. This study aims to develop and evaluate the effectiveness of the "Reproductive Health Pillow T-Shirt GIRL" educational media using the Research and Development (R&D) method. This interactive media was designed in collaboration with professional fashion designers and media experts. A quasi-experimental study with a control group was conducted involving 98 adolescent girls aged 13–15 years in junior high schools in Jakarta. The intervention group utilized the "Pillow T-Shirt," while the control group received lectures using audiovisual aids. Results demonstrated a significant increase in knowledge among the intervention group compared to the control group. This media shows promise as a standard educational tool for reproductive health in schools.

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## 1. Introduction

Adolescence is a critical period that shapes the quality of future generations. In Indonesia, adolescents constitute 24% of the population, with approximately 21.56 million aged 15–19 years (Lantos et al., 2019). This demographic represents a vulnerable group undergoing significant physical, emotional, and social changes, often without adequate guidance or information (Yuniarti et al., 2024). Limited access to reproductive health education has led to a range of issues, including unintended pregnancies, sexually transmitted infections, and misinformation regarding reproductive health (Lantos et al., 2019).

The rapidly growing availability of information through digital media has provided both opportunities and challenges for adolescents. While online platforms can offer useful knowledge, they are often unregulated and expose adolescents to inaccurate or harmful content (Abdul-Wahab et al., 2021). Current educational tools, such as printed modules or online applications, have their limitations. Printed materials tend to lack interactivity, while digital tools are dependent on internet connectivity, which may not always be accessible (Mancone et al., 2024).

In this context, the need for innovative, practical, and engaging educational tools becomes evident. The "Reproductive Health Pillow T-Shirt GIRL" was designed as an interactive medium to bridge this gap. Unlike traditional methods, this tool allows hands-on engagement, making learning more effective and enjoyable. By incorporating visual and tactile elements, the "Pillow T-Shirt" simplifies

complex concepts, such as the structure and function of the female reproductive system, making it accessible for adolescents.

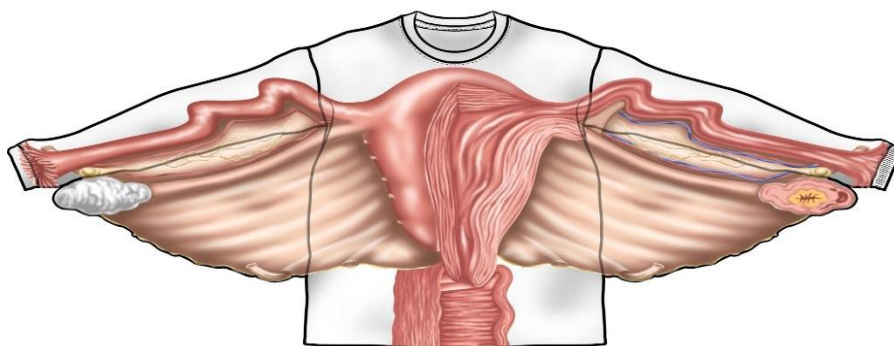
Previous studies have shown that interactive educational methods can significantly enhance knowledge retention and behavioral change (Ragamin et al., 2022). A study conducted in Nigeria demonstrated that sexual health education could reduce the prevalence of risky sexual behavior among adolescents (MICHA, 2017). Similarly, research in Indonesia highlighted the effectiveness of interactive modules in improving reproductive health knowledge among high school students (Mariana, 2024). Additionally, one study reported that integrating digital interactive tools improved comprehension and engagement among adolescent learners further emphasized the importance of interactive methods in fostering positive health behaviors in young populations (Noor et al., 2020).

This study aims to evaluate the effectiveness of the "Reproductive Health Pillow T-Shirt GIRL" in increasing reproductive health knowledge and preventing unintended pregnancies among adolescent girls. By introducing an innovative and accessible tool, this research seeks to address the limitations of existing educational media and contribute to the broader effort of promoting adolescent reproductive health in Indonesia.

## 2. Method

This study employed the Research and Development (R&D) method combined with a quasi-experimental design to assess the effectiveness of the "Reproductive Health Pillow T-Shirt GIRL." The ADDIE model guided the development process, ensuring a systematic approach:

1. **Analysis:** This phase involved identifying the educational needs of adolescent girls through discussions with health workers and teachers. Key areas of knowledge deficiency, such as understanding reproductive anatomy and methods of preventing unintended pregnancies, were highlighted.
2. **Design:** In collaboration with professional fashion designers and media experts, the "Pillow T-Shirt" was conceptualized. The design incorporated detachable components representing reproductive organs, allowing for interactive learning sessions. Feedback from pilot focus groups influenced the final design.
3. **Development:** Prototypes of the "Pillow T-Shirt" were constructed, and iterative improvements were made based on validation by educational and medical experts. This stage also included the creation of accompanying instructional materials to guide educators.



**Fig. 1.** Reproductive Health Pillow T-Shirt GIRL

4. **Implementation:** The study sample consisted of 96 adolescent girls (48 intervention and 48 control) selected via purposive sampling from junior high schools in Jakarta. The intervention group participated in interactive sessions using the "Pillow T-Shirt," while the control group received conventional lectures with audiovisual aids.

5. Evaluation: Effectiveness was measured through pre- and post-tests administered to both groups. The questionnaire, specifically designed for this study, included 30 questions focusing on reproductive anatomy and pregnancy prevention methods. It employed a Guttman scale with scores ranging from 0 to 30, where higher scores indicated better knowledge. The questionnaire was validated with a Cronbach's alpha of 0.85, indicating high reliability. Pre-tests were conducted immediately before the educational intervention, and post-tests were administered immediately after the intervention to measure immediate knowledge retention (Noor et al., 2020).

Prior to selecting statistical analyses, data were tested for normality using the Shapiro-Wilk test. The results indicated that the data were not normally distributed; therefore, non-parametric tests were employed. The Wilcoxon Signed Rank Test was used to compare pre- and post-test scores within each group. Additionally, an independent t-test was conducted to compare the mean post-test scores between the intervention and control groups, as the assumption of normality was satisfied for these comparisons.

This study received ethical approval from the Ethics Committee of Universitas Respati Jakarta with approval number 444/SK.KEPK/UNR/VII/ 2024, ensuring adherence to ethical standards in research involving human participant

### 3. Results and Discussion

**Table 1.** Characteristics of Respondents

Characteristic	Intervention Group (n=48) (%)	Control Group (n=48) (%)
Exposure to reproductive health information		
1. Never	31.0	43.7
2. Ever	69.0	56.3
Parent's education level		
1. Basic	10.4	14.5
2. Intermediate	43.8	37.5
3. Higher	45.8	48.0

Based on table 1, the majority of participants in both groups had been exposed to reproductive health information, although the intervention group showed a slightly higher percentage. Regarding parental education levels, both groups demonstrated a similar distribution, with the majority of parents having intermediate to higher education, which might contribute to baseline knowledge differences between the groups

**Table 2.** Pre-Test and Post-Test Knowledge Scores

Group	Pre-Test Mean (SD)	Post-Test Mean (SD)	Improvement (%)	p-value *
Intervention Group	74.5 (2.25)	87.2 (2.10)	16.9	< 0.001
Control Group	73.6 (2.70)	78.4 (2.50)	6.5	0.045

Wilcoxon test

According to table 2, the intervention group demonstrated a substantial improvement of 16.9% in knowledge scores after the use of the "Pillow T-Shirt," compared to only 6.5% in the control group. These findings suggest that the interactive nature of the "Pillow T-Shirt" contributes significantly to knowledge retention and engagement compared to traditional lecture methods. The Wilcoxon Signed Rank Test results indicate that the "Pillow T-Shirt" significantly improved knowledge in the intervention group ( $p < 0.001$ ), demonstrating the effectiveness of the interactive educational media. The control group also showed a modest but statistically significant improvement ( $p = 0.045$ ), likely due to the lecture-based intervention. The larger effect size observed in the intervention group highlights the superior impact of the "Pillow T-Shirt" on knowledge retention and engagement compared to traditional methods.

The findings of this study demonstrate that the use of the "Reproductive Health Pillow T-Shirt GIRL" educational media significantly improved adolescent girls' knowledge about reproductive health compared to traditional counseling methods. These results align with previous studies that

emphasize the effectiveness of interactive approaches in reproductive health education (Yuniarti et al., 2024; Mancone et al., 2024).

Interactive educational media such as the “Pillow T-Shirt” enables adolescents to better comprehend complex concepts of the reproductive system through visual and tactile approaches. Studies suggest that interactive methods enhance knowledge retention and student engagement in the learning process (Branson & Byker, 2018). Moreover, this approach addresses the challenges of limited access to reproductive health information, especially in areas with restricted internet connectivity (Abdul Hamid Alhassan et al., 2025).

The significant increase in knowledge within the intervention group highlights the potential of this media to influence adolescent behaviors related to reproductive health. Previous research underscores that improved parent-teen communication and access to youth-friendly health services reduce unintended pregnancies and sexually transmitted infections (Lantos et al., 2019; Purbini et al., 2015).

Traditional counseling methods using audiovisual tools have demonstrated limitations in capturing adolescents' attention and internalizing complex information (Godswill, 2012). In contrast, the “Pillow T-Shirt” not only delivers information but also provides a hands-on experience, which supports kinesthetic learning styles in adolescents (Waliyanti & Dewantari, 2021).

These results align with global findings highlighting the benefits of context-sensitive and age-appropriate educational interventions. One study emphasized that culturally tailored, engaging media significantly enhance reproductive health outcomes in adolescents (Saha et al., 2022). Similarly, one scoping review demonstrated the efficacy of innovative educational tools like anatomical dolls and health games in improving reproductive health literacy and behavior among young people (Putri et al., 2025).

Importantly, this study does more than address knowledge gaps contributes to breaking the cultural silence around reproductive health education. In the Indonesian context, where such topics often remain taboo, the Pillow T-Shirt provides a playful yet respectful medium that fosters open discussion in a safe and comfortable environment. This approach echoes the recommendations of UNESCO (2018), which stress the importance of using creative and culturally sensitive methods in sexuality education, particularly in conservative communities (Garoutte, 2022).

Moreover, the Pillow T-Shirt accommodates diverse learning preferences, particularly for kinesthetic and visual learners. According to the VARK model, such learners benefit significantly from tactile and visual input (El-Saftawy et al., 2024). The multisensory nature of the media not only enhances learner engagement but also mitigates cognitive overload, in line with the principles of cognitive load theory (El-Saftawy et al., 2024).

This educational media can be widely adopted in schools and communities to raise awareness of reproductive health. Additional implications include developing similar training materials for other health topics, such as adolescent nutrition and sexually transmitted disease prevention (Wilkins et al., 2022); (Maheshwari et al., 2022).

Limitations of this study include a primary limitation of this study is the restricted sample size confined to a single geographic area. Further research with broader coverage is required to explore the effectiveness of this media across diverse cultural and social contexts. Additionally, long-term evaluations are necessary to assess the impact on behavioral changes and health outcomes.

#### 4. Conclusion

The "Reproductive Health Pillow T-Shirt GIRL" represents an innovative and effective educational medium for enhancing adolescent girls' knowledge of reproductive health. Its interactive and multisensory design offers a practical alternative to conventional methods, making it particularly useful in settings with limited digital access.

Future research should explore the long-term impact of this media on behavior change and reproductive health outcomes. Additionally, studies involving larger and more diverse populations are needed to assess its applicability across different cultural contexts. Policymakers and educators should consider integrating such interactive tools into school health curricula and national adolescent health programs to support early, engaging, and effective reproductive health education.

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