

*Improving Adolescents' Knowledge of Puberty Through Reproductive Health Education
in Pangkalan Masyhur Family Planning Village*

Lasria Yolivia Aruan^{1*}, Plora Novita Sinaga¹, Sri Mulati Nendah Agreta¹, Rahmi Larasati¹, Klarasati¹

¹STIKes Mitra Husada Medan, Medan, Indonesia

*Correspondence: yolivialasria@gmail.com

ABSTRACT

Adolescence is an important transitional period characterized by physical, psychological, emotional, and social changes associated with puberty. In Kampung KB Pangkalan Masyhur, Medan Johor District, adolescents were identified as having limited knowledge of pubertal changes and reproductive health, as well as limited access to youth-friendly educational media. This community service program aimed to improve adolescents' knowledge of puberty and reproductive health through interactive and technology-supported education. The program involved 30 adolescents aged 12–18 years. Education was delivered through interactive presentations, group discussions, question-and-answer sessions, printed leaflets, and the digital “CERIA PUBERTAS” flipbook. Knowledge was assessed using pre-test and post-test scores. Data were analyzed descriptively, and differences between paired scores were examined using the Wilcoxon Signed-Rank Test because the score distributions were not normally distributed. The mean knowledge score increased from 59.83 before the intervention to 90.20 after the intervention, representing an average increase of 30.37 points. All participants obtained higher post-test scores than their corresponding pre-test scores. The Wilcoxon Signed-Rank Test showed a statistically significant increase in knowledge scores ($Z = -5.041$, $p < .001$), with a large effect size ($r = .920$). These findings indicate that interactive and technology-supported reproductive health education was associated with a substantial improvement in adolescents' knowledge of puberty and reproductive health. Continued community-based education involving adolescent cadres and accessible educational media may help sustain reproductive health promotion among adolescents.

Keywords: Adolescents; Puberty; Reproductive Health Education; Community-Based Education; Kampung KB.

INTRODUCTION

Adolescence is a critical developmental period characterized by substantial physical, psychological, emotional, and social changes associated with puberty. During this period, adequate knowledge of puberty and reproductive health is essential to help adolescents understand the changes they experience and respond to them appropriately. Limited knowledge may contribute to misconceptions, embarrassment, anxiety, and inappropriate responses to pubertal changes. Age-appropriate and scientifically accurate reproductive health education can provide adolescents with reliable information about their bodies, puberty, reproductive health, and healthy decision-making. Therefore, reproductive health education represents an important component of adolescent health promotion (World Health Organization, 2026).

In Kampung KB Pangkalan Masyhur, Medan Johor District, initial program observations identified several challenges related to adolescent reproductive health, including limited understanding of puberty, restricted access to youth-friendly educational media, and low participation in reproductive health activities. Adolescents may also feel embarrassed or reluctant to discuss issues such as menstruation, wet dreams, physical changes, and reproductive hygiene openly. These conditions can limit access to accurate information and highlight the need for educational approaches that are accessible, engaging, and responsive to adolescents' learning and communication characteristics.

Previous studies have shown that structured reproductive health education can improve adolescents' knowledge of puberty and reproductive health (Nurhayati, 2023; Syamsuddin, 2023; Ismiati et al., 2024). Community-based educational activities using interactive lectures, discussions, visual media, videos, and other educational materials have also demonstrated improvements in adolescents' understanding of reproductive health topics (Purba et al., 2022; Rahardiantini et al., 2024; Zakiyyah et al., 2025). In addition, digital-based educational media have been identified as accessible and youth-friendly approaches for delivering reproductive health information to adolescents (Yana et al., 2024). A recent review of puberty education also indicates that interactive, technology-based, and empowerment-oriented educational approaches may support improvements in adolescents' understanding of pubertal changes (Qoyimatul & Realita, 2026). These findings suggest that combining verbal explanations with interactive, visual, and digital learning media may facilitate adolescents' understanding of topics that are often considered sensitive or difficult to discuss.

Despite these developments, the integration of interactive learning, technology-supported educational media, and community-based support remains relatively limited in adolescent reproductive health programs at the community level. In addition, educational activities are often implemented as short-term interventions without sufficient involvement of local youth cadres to support continuity after the program ends. Peer-based approaches have been reported to support improvements in adolescents' reproductive health knowledge and provide opportunities for young people to exchange information with individuals of similar age and experience (Juariah, 2021; Lorenz & Permatasari, 2023). Involving adolescent cadres and community-based services may therefore provide opportunities for continued access to reproductive health information and peer-supported learning (Nisa et al., 2025; Sumaryani & Purwaningsih, 2024). Accordingly, an educational approach that combines interactive learning, youth-friendly materials, digital media, and the involvement of Kampung KB cadres may offer practical advantages for improving knowledge while supporting the sustainability of adolescent reproductive health education.

Accordingly, this community-based program aimed to **improve adolescents' knowledge of puberty and reproductive health through interactive and technology-supported education** in Kampung KB Pangkalan Masyhur. The program also involved Kampung KB cadres to support the continuity of adolescent reproductive health education within the community.

METHOD

This Community Service Program (PkM) employed an educational, participatory, and technology-supported approach to improve adolescents' knowledge of puberty and reproductive health. The program was implemented in Kampung KB Pangkalan Masyhur, Medan Johor District, Medan City, North Sumatra Province.

Participants, Setting, and Ethical Considerations

The program involved 30 adolescents residing in or participating in adolescent activities in Kampung KB Pangkalan Masyhur. Participants were recruited using purposive sampling in coordination with the Kampung KB management and adolescent cadres. The inclusion criteria were: (1) adolescents residing in Kampung KB Pangkalan Masyhur; (2) being within the target adolescent age range of the program; (3) being willing to participate in the complete series of activities, including the pre-test, educational session, mentoring, and post-test; (4) being able to read and understand the questionnaire; and (5) obtaining parental or guardian consent for participants under 18 years of age. Participants who did not complete both the pre-

test and post-test or did not participate in the main educational activities were excluded from the evaluation.

The main educational activity was conducted on June 24, 2026, at 11:00 AM in Kampung KB Pangkalan Masyhur and lasted approximately three hours. Ethical considerations were applied because several participants were under 18 years of age. Before participation, adolescents and their parents or legal guardians received information regarding the objectives, procedures, benefits, confidentiality, voluntary participation, and their right to withdraw. Parental or guardian informed consent was obtained for participants under 18 years of age, and adolescent assent was also obtained. Participant identities were kept confidential, and the pre-test and post-test data were reported only in aggregate form. No formal ethical approval was obtained for this community service activity; however, the principles of informed consent, assent, confidentiality, voluntariness, and protection of participants' rights were maintained throughout the program.

Program Preparation and Educational Intervention

The program began with coordination and socialization involving the Kampung KB management, adolescent cadres, community representatives, and adolescent participants. This stage aimed to explain the objectives, benefits, procedures, schedule, and roles of participants during the program. The implementation team prepared the necessary facilities and educational materials, including a classroom, LCD projector, sound system, internet access, educational leaflets, the digital "CERIA PUBERTAS" flipbook, pre-test and post-test questionnaires, observation sheets, attendance lists, and documentation equipment.

Before the educational intervention, all participants completed a pre-test to assess their baseline knowledge of puberty and reproductive health. Health education was delivered through interactive lectures, group discussions, simulations, question-and-answer sessions, and printed and digital educational media. The educational materials covered the definition of puberty and adolescence, physical changes in male and female adolescents, psychological and emotional changes, menstruation, wet dreams, reproductive organ development, personal hygiene and reproductive health, myths and facts about puberty, self-confidence and positive self-image, emotional management, healthy communication with parents and peers, and prevention of risky behaviors among adolescents. Mentoring and discussion sessions were conducted during and after the educational activities to allow participants to clarify misconceptions and discuss puberty-related concerns with the facilitators.

Measurement Instrument and Outcome Assessment

Changes in participants' knowledge were assessed using a 10-item multiple-choice questionnaire administered before and after the educational intervention. The same questionnaire was used for the pre-test and post-test to allow paired comparison of participants' knowledge scores. The questionnaire covered key aspects of puberty and adolescent reproductive health, including the concept of puberty, physical changes, psychological and emotional changes, menstruation, wet dreams, reproductive organ development, personal hygiene, reproductive health, and common myths and facts regarding puberty.

For the present analysis, the final pre-test and post-test scores recorded by the implementation team were used as the primary outcome data. Scores were expressed on a 0-100 scale. Because the original item-level scoring and score-conversion records were not retained, the statistical analysis was conducted using the final recorded scores for each participant, and no additional score transformation was performed during the re-analysis.

For descriptive interpretation, knowledge scores were classified into three categories: good (76–100), moderate (56–75), and poor (≤ 55). Outcome evaluation was based primarily on the comparison of pre-test and post-test knowledge scores. Process evaluation also considered participant involvement during the educational activities.

Data Analysis

Data were analyzed using descriptive and inferential statistical methods. Descriptive statistics included frequency, percentage, mean, standard deviation, median, minimum, and maximum values. The normality of the pre-test and post-test knowledge scores was assessed using the Shapiro–Wilk test.

Because the score distributions did not meet the assumption of normality, differences between paired pre-test and post-test scores were analyzed using the Wilcoxon Signed-Rank Test. Statistical significance was set at $\alpha = 0.05$, and a p-value < 0.05 was considered statistically significant. The standardized Z statistic was used to calculate the effect size using the formula $r = |Z|/\sqrt{N}$, where N represents the number of paired observations. Effect size was interpreted as small ($r \geq 0.10$), moderate ($r \geq 0.30$), and large ($r \geq 0.50$).

The statistical analysis was reconstructed from the available paired raw data of the 30 participants using the final recorded pre-test and post-test scores.

Program Sustainability and Implementation Flow

Program sustainability was supported by involving adolescent cadres and the Kampung KB management in follow-up reproductive health education. Educational materials, including printed leaflets and digital media, were provided for continued use after completion of the program. Adolescent cadres were encouraged to serve as peer educators and facilitate periodic discussions regarding puberty and reproductive health. Continued communication and collaboration between STIKes Mitra Husada Medan and Kampung KB Pangkalan Masyhur were also encouraged to support adolescent development activities.

The overall implementation flow was as follows:

Coordination with partners → Participant recruitment → Parental/guardian informed consent and adolescent assent → Pre-test → Health education and training → Mentoring and discussion → Post-test → Data analysis → Evaluation → Program sustainability.

RESULT

The community service program was conducted in Kampung KB Pangkalan Masyhur, Medan Johor District, Medan City, in June 2026 and involved 30 adolescents aged 12–18 years. All participants completed both the pre-test and post-test and were included in the final analysis.

Participant Characteristics

Table 1. Participant Characteristics

Characteristics		Frequency (n)	Percentage (%)
Age	12–14 years	18	60.0
	15–18 years	12	40.0
Gender	Male	13	43.3
	Female	17	56.7
Total		30	100.0

Most participants were aged 12–14 years (60.0%), while 40.0% were aged 15–18 years. Female participants accounted for 56.7% of the sample, whereas male participants accounted for 43.3%.

All participants completed the pre-test before receiving the educational intervention and the post-test after completion of the educational session. Documentation of the assessment process is presented in Figure 1.



Figure 1. Administration of the Pre-test and Post-test to Adolescent Participants

Pre-test and Post-test Knowledge Scores

Descriptive analysis was conducted to compare participants' knowledge scores before and after the educational intervention. The analysis included the mean, standard deviation, median, minimum, and maximum scores for the pre-test and post-test.

Table 2. Descriptive Statistics of Pre-test and Post-test Knowledge Scores

Variable	N	Mean	SD	Median	Minimum	Maximum
Pre-test	30	59.83	17.64	75.00	40	75
Post-test	30	90.20	12.12	98.00	72	98

Note: SD = standard deviation.

The mean knowledge score increased from 59.83 ± 17.64 before the educational intervention to 90.20 ± 12.12 after the intervention, representing an average increase of 30.37 points. The median score also increased from 75.00 at pre-test to 98.00 at post-test. All 30 participants had higher post-test scores than their corresponding pre-test scores.

The observed improvement in knowledge scores followed the reproductive health education delivered through interactive lectures, discussions, question-and-answer sessions, printed materials, and digital educational media. Documentation of the educational session is presented in Figure 2.



Figure 2 Provision of Education

Distribution of Knowledge Categories

To provide a descriptive overview of changes in knowledge levels, participants' scores were classified into three categories: good (76–100), moderate (56–75), and poor (≤ 55). The distribution of participants across these categories before and after the educational intervention is presented in Table 3.

Table 3. Knowledge Categories Before and After the Educational Intervention

Knowledge Category	Pre-test n (%)	Post-test n (%)
Good (76–100)	0 (0.0%)	21 (70.0%)
Moderate (56–75)	17 (56.7%)	9 (30.0%)
Poor (≤ 55)	13 (43.3%)	0 (0.0%)
Total	30 (100.0%)	30 (100.0%)

Before the intervention, 13 participants (43.3%) were classified as having poor knowledge and 17 participants (56.7%) had moderate knowledge. None of the participants were classified as having good knowledge at pre-test. After the intervention, 21 participants (70.0%) were classified as having good knowledge and 9 participants (30.0%) had moderate knowledge, while no participants remained in the poor knowledge category.

Normality and Wilcoxon Signed-Rank Test

The Shapiro-Wilk test indicated that both the pre-test and post-test score distributions deviated significantly from normality (pre-test: $W = 0.632$, $p < .001$; post-test: $W = 0.577$, $p < .001$). Therefore, the difference between paired pre-test and post-test scores was examined using the Wilcoxon Signed-Rank Test.

Table 4. Wilcoxon Signed-Rank Test of Pre-test and Post-test Knowledge Scores

Comparison	Positive Ranks	Negative Ranks	Ties	W	Z	p-value	Effect Size (r)
Pre-test vs. Post-test	30	0	0	0.00	-5.041	< .001	0.920

The Wilcoxon Signed-Rank Test showed a statistically significant increase in knowledge scores following the educational intervention ($Z = -5.041$, $p < .001$). All 30 participants

demonstrated higher post-test scores, with no negative ranks or ties. The effect size was $r = 0.920$, indicating a large magnitude of change in knowledge scores following the intervention.

DISCUSSION

The findings demonstrated a substantial improvement in adolescents' knowledge of puberty and reproductive health following the educational intervention. The mean knowledge score increased from 59.83 before the intervention to 90.20 after the intervention, representing an average increase of 30.37 points. All 30 participants obtained higher post-test scores than their corresponding pre-test scores. The Wilcoxon Signed-Rank Test confirmed a statistically significant difference between pre-test and post-test scores ($Z = -5.041$, $p < .001$), with a large effect size ($r = .920$). These findings are consistent with previous studies reporting that structured reproductive health education can significantly improve adolescents' knowledge regarding puberty and reproductive health (Nurhayati, 2023; Syamsuddin, 2023; Ismiati et al., 2024; Sumaryani & Purwaningsih, 2024).

The improvement in knowledge may be associated with the educational strategies used during the program. The intervention combined interactive lectures, group discussions, question-and-answer sessions, printed leaflets, and the digital "CERIA PUBERTAS" flipbook. The use of interactive and visual educational media may help adolescents understand information about physical, psychological, and reproductive changes during puberty in a more accessible and engaging manner. Similar approaches have been applied in previous community-based programs using lectures, videos, visual media, and other educational tools to support adolescents' understanding of puberty and reproductive health (Purba et al., 2022; Rahardiantini et al., 2024; Zakiyyah et al., 2025). The combination of verbal explanation and visual materials may also provide multiple opportunities for participants to process information and clarify misconceptions regarding sensitive reproductive health topics.

Changes in the distribution of knowledge categories further illustrate the improvement observed after the intervention. Before the educational activity, 13 participants (43.3%) were classified as having poor knowledge and 17 participants (56.7%) had moderate knowledge, while none were classified as having good knowledge. After the intervention, no participants remained in the poor-knowledge category, and 21 participants (70.0%) were classified as having good knowledge. This shift indicates that the improvement was not limited to an increase in the average score but was also reflected in a broader movement of participants toward higher knowledge categories. Similar improvements in adolescent knowledge following puberty and reproductive health education have been reported by Syamsuddin (2023), Ismiati et al. (2024), and Febriaty et al. (2026).

During the educational and discussion sessions, participants were observed to become more active in asking questions related to menstruation, wet dreams, changes in body shape, personal hygiene, and other puberty-related concerns. This observation suggests that an interactive educational environment may encourage adolescents to discuss issues that are often considered sensitive or embarrassing. Previous community-based reproductive health programs have similarly emphasized participatory approaches and opportunities for adolescents to communicate openly about reproductive health concerns (Purba et al., 2022; Nisa et al., 2025). Nevertheless, the increased participation observed in the present program should be interpreted only as a process-related observation and not as evidence of a measurable improvement in attitudes or readiness, because these outcomes were not quantitatively assessed.

The involvement of adolescent cadres and the Kampung KB management also has practical implications for the sustainability of the program. Adolescents may require repeated access to reliable reproductive health information rather than a single educational session. Providing reusable educational materials and involving adolescent cadres as peer educators may support continued dissemination of puberty and reproductive health information within the community. Community- and youth-based reproductive health programs have highlighted the potential role of peer involvement and local youth services in strengthening adolescent participation and maintaining health education activities beyond the initial intervention (Nisa et al., 2025; Sumaryani & Purwaningsih, 2024). Therefore, strengthening the capacity of adolescent cadres and maintaining collaboration between STIKes Mitra Husada Medan and Kampung KB Pangkalan Masyhur may help support the continuity of similar educational activities.

Despite the positive findings, several limitations should be considered. First, the program involved only 30 adolescents from a single community, which limits the generalizability of the findings to broader adolescent populations. Second, the evaluation used a one-group pre-test-post-test design without a comparison group; therefore, the observed increase in knowledge cannot be attributed exclusively to the educational intervention. Third, the post-test was conducted shortly after the educational activity, so the findings primarily reflect short-term changes in knowledge and do not demonstrate whether the improvement was maintained over time. Fourth, the evaluation focused primarily on knowledge, while changes in attitudes, readiness, and reproductive health behavior were not quantitatively measured. Future programs should consider larger and more diverse participant groups, follow-up assessments, comparison groups where feasible, and validated measures of attitudes and behavioral outcomes to provide a more comprehensive evaluation of the impact of adolescent reproductive health education.

CONCLUSION

The reproductive health education program on puberty implemented among 30 adolescents in Kampung KB Pangkalan Masyhur was associated with a substantial improvement in participants' knowledge. The mean knowledge score increased from 59.83 before the intervention to 90.20 after the intervention, representing an average increase of 30.37 points. The Wilcoxon Signed-Rank Test confirmed a statistically significant increase in knowledge scores ($Z = -5.041$, $p < .001$), with a large effect size ($r = .920$). These findings indicate that interactive and technology-supported reproductive health education may be a useful approach for improving adolescents' knowledge of puberty and reproductive health.

To support program sustainability, similar educational activities should be continued through Kampung KB programs with the involvement of adolescent cadres and the continued use of accessible educational materials, including printed and digital media. Future programs should also include follow-up assessments to evaluate the retention of knowledge over time.

ACKNOWLEDGEMENT

The authors would like to express their sincere appreciation to STIKes Mitra Husada Medan, the management of Kampung KB Pangkalan Masyhur, the Family Planning Service Coordinator of Kampung KB Pangkalan Masyhur, and the local community for their support, cooperation, and contribution to the implementation of this community service program.

REFERENCES

- Febriaty, D., Olivia, D. N., Aliyah, H. M., Deliana, A., Sari, S. A. E., Fitroh, A., & Al Mududi, A. A. (2026). Edukasi pubertas sebagai upaya peningkatan pengetahuan kesehatan reproduksi remaja pada siswa/i di Pondok Pesantren SMP Sabiluna. *Jurnal Kesehatan Masyarakat Indonesia (JKMI)*, 3(2), 35–44. <https://doi.org/10.62017/jkmi.v3i2.6904>
- Ismiati, I., Sustiyani, E., Ningsih, H., Khairani, F., & Lestari, M. A. (2024). Edukasi kesehatan reproduksi terhadap pengetahuan pada remaja pubertas. *Jurnal Peduli Masyarakat*, 6(3), 1031–1040. <https://doi.org/10.37287/jpm.v6i3.4214>
- Juariah, J. (2021). Pendidikan sebaya meningkatkan pengetahuan remaja awal tentang kesehatan reproduksi (Studi pada sekolah menengah pertama di Kabupaten Subang, Jawa Barat). *Kesmas Indonesia*, 13(2), 261–275. <https://doi.org/10.20884/1.ki.2021.13.2.3800>
- Lorenz, F. Q. Q., & Permatasari, H. (2023). Implementasi peer education dalam meningkatkan pengetahuan remaja mengenai kesehatan reproduksi. *Jurnal Keperawatan Silampari*, 6(2), 1817–1826. <https://doi.org/10.31539/jks.v6i2.5867>
- Nisa, A. A., Sabrina, A. K. N., Rahmatammina, R. N., Firahmadhani, A., Katantri, Z., Lusiyan, V., Alwana, J. G., Rifli, N. F. N., & Nugroho, E. (2025). Reproductive health education based on positive youth development through youth posyandu. *Jurnal Promkes: The Indonesian Journal of Health Promotion and Health Education*, 13(SI2), 129–134. <https://doi.org/10.20473/jpk.V13.ISI2.2025.129-134>
- Nurhayati, E. (2023). Pengaruh edukasi terhadap pengetahuan remaja tentang kesehatan reproduksi. *Indonesian Journal of Nursing Health Science*, 8(1), 91–98. <https://doi.org/10.47007/ijnhs.v8i1.6234>
- Purba, N. H., Adhyatma, A. A., Panggabean, S. M. U., Harindra, H., & Pakpahan, Y. F. (2022). Edukasi kesehatan reproduksi tentang pengenalan organ reproduksi pada remaja awal. *JMM (Jurnal Masyarakat Mandiri)*, 6(4), 3228–3236. <https://doi.org/10.31764/jmm.v6i4.9537>
- Qoyimatul, D., & Realita, F. (2026). The effect of puberty education on knowledge and attitudes related to puberty changes. *Jurnal Maternitas Kebidanan*, 11(1), 45–57. <https://doi.org/10.34012/jumkep.v11i1.8061>
- Rahardiantini, I., Siagian, Y., & Ernawati, E. (2024). Pengenalan organ reproduksi dan pubertas melalui edukasi kesehatan pada remaja awal di SDN 013 Tanjungpinang Timur. *Jurnal Abdi Masyarakat Indonesia*, 4(1), 267–272. <https://doi.org/10.54082/jamsi.1083>
- Sumaryani, S., & Purwaningsih, H. (2024). Adolescents and reproductive health: Promoting healthy habits for reproductive well-being. *Journal of Community Service and Empowerment*, 5(1), 199–204. <https://doi.org/10.22219/jcse.v5i1.27646>
- Syamsuddin, S. D. (2023). Pengaruh edukasi kesehatan reproduksi terhadap pengetahuan pada remaja pubertas di SMPN 1 Kapala Pitu tahun 2022. *Jurnal Midwifery*, 5(1), 27–33. <https://doi.org/10.24252/jmw.v5i1.35187>
- World Health Organization. (2026, March 11). *Comprehensive sexuality education*. <https://www.who.int/news-room/fact-sheets/detail/comprehensive-sexuality-education>
- Yana, E., Prasetyo, D., & Zulvayanti, Z. (2024). Utilization of digital-based educational media to increase adolescent reproductive health knowledge: A literature review. *Media*

Penelitian dan Pengembangan Kesehatan, 34(2), 464-479.
<https://doi.org/10.34011/jmp2k.v34i2.2070>

Zakiyyah, Z., Puspa Lestari, S. D., Madaniah, S. A.-S., Sri Wahyuni, S. P. A., Sholihah, S., & Sufi, S. N. (2025). Peningkatan kesadaran kesehatan reproduksi remaja melalui edukasi dengan ceramah interaktif dan media visual serta asesmen pengetahuan di SMP Negeri 1 Plumbon, Kabupaten Cirebon. *Jurnal Pengabdian Masyarakat Indonesia*, 5(4), 665-672.
<https://doi.org/10.52436/1.jpmi.3637>

Copyright holder :

©The Author(s), 2026

First publication right :

Room of Civil Society Development

This article is licensed under:

CC-BY-SA