INTERNATIONAL CONFERENCE
ON LIFESTYLE DISEASES AND NATURAL MEDICINE (ICOLIFEMED)
Nomor ISSN: 3124-1115

Evaluating the impact of PIK-KRR and family physician counseling on adolescent reproductive health

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ABSTRACT

Adolescents are a vulnerable population concerning reproductive health due to a lack of accurate knowledge and information. The Adolescent Reproductive Health Information and Counseling Center (Pusat Informasi dan Konseling Kesehatan Reproduksi Remaja; PIK-KRR), alongside the role of family physicians, plays a critical role in providing education and counseling related to reproductive health. This study aimed to evaluate the effectiveness of PIK-KRR and the involvement of family physicians in enhancing adolescents' knowledge of reproductive health at MAN 2 Model Medan. A quasi-experimental design was employed, using pre-test and post-test assessments in both intervention and control groups. The study population comprised all students at MAN 2 Model Medan, with a purposive sample of 30 respondents selected. Data were collected via a structured questionnaire and analyzed using paired t-tests and independent t-tests. The results indicated a statistically significant improvement in adolescents' reproductive health knowledge following interventions delivered through both PIK-KRR and family physician counseling ($p < 0.05$). Moreover, the involvement of family physicians had a greater impact compared to PIK-KRR alone. In conclusion, both PIK-KRR and family physicians are effective in improving adolescents' reproductive health knowledge, with counseling provided by family physicians yielding a more pronounced effect. It is recommended that schools and relevant stakeholders enhance the sustainability of PIK-KRR programs and strengthen the role of family physicians in adolescent health education.

Keywords: *PIK-KRR, family physician, adolescent knowledge, reproductive health*

INTRODUCTION

Adolescence represents a critical transitional period in the human life cycle, characterized by rapid biological, psychological, and social changes (Jaworska & MacQueen, 2015; Mastorci et al., 2024). During this phase, adolescents begin to explore their identity, including their sexuality, which renders them vulnerable to various health risks such as unintended pregnancy, sexually transmitted infections (STIs) including HIV/AIDS, and sexual violence (Shalahuddin & Rosidin, 2024; WHO, 2018, 2021). Therefore, accurate and comprehensive knowledge of reproductive health is fundamental for adolescents to make responsible decisions, protect themselves from risks, and establish healthy behaviors that persist into adulthood. Investing in reproductive health education for adolescents is a strategic approach

Nomor ISSN: 3124-1115

to improving the quality of human resources in the future (Balumbi et al., 2025; Salam et al., 2016).

Globally, more than one million new, treatable sexually transmitted infections (STIs) are contracted daily by people aged 15 to 49, with most cases showing no symptoms. In 2020 alone, this age group experienced 374 million new infections of chlamydia, gonorrhea, syphilis, and trichomoniasis. Specific infections are widespread; for example, 8 million adults contracted syphilis in 2022, and an estimated 520 million people (13%) in this demographic live with herpes simplex virus type 2 (HSV-2), the virus that causes genital herpes (WHO, 2025). At the national level, reproductive health literacy among Indonesian adolescents remains a significant challenge. The 2022 Indonesia Demographic and Health Survey (IDHS) revealed a concerning fact: nearly half (47.9%) of adolescent females were unaware of their fertile period (Hastuti, 2024). This situation is exacerbated by statistics from the Indonesian Central Statistics Agency (Badan Pusat Statistik, BPS), which recorded a child marriage rate of 10.82% in 2019 (Dinas Pemberdayaan Perempuan Perlindungan Anak dan Pengendalian Penduduk (DP3AP2) DIY, 2022). Locally, Medan, as a metropolitan city with complex social dynamics, poses its own challenges (Damanik, 2024). Adolescents are exposed to a massive influx of unfiltered digital media information and cultural influences that sometimes hinder access to accurate reproductive health information (Badrun et al., 2024). These conditions underscore the urgent need to improve reproductive health literacy among adolescents, including students in school environments such as Madrasah Aliyah Negeri (MAN) 2 Model Medan.

In response to this issue, the government, through the National Population and Family Planning Board (BKKBN), has initiated the Adolescent Reproductive Health Information and Counseling Center program (Pusat Informasi dan Konseling Kesehatan Reproduksi Remaja, PIK-KRR). This program employs a "by, from, and for adolescents" approach that relies on peer counsellors (Astuti et al., 2025). This model has proven effective in reducing discomfort and creating a more supportive environment for adolescents to discuss and inquire about sensitive reproductive health topics (Sari et al., 2023). Various studies across multiple locations have demonstrated the effectiveness of PIK-KRR in enhancing adolescent knowledge; however, its efficacy requires continuous evaluation within specific socio-cultural contexts (Harmaniar et al., 2023; Irmawati et al., 2025; Nugroho et al., 2021).

Conversely, a professional, credible, and trusted source of health information is the family physician. The role of family physicians extends beyond curative measures to encompass promotive and preventive functions. In the context of reproductive health, family physicians can provide medically accurate education that is personalized to the adolescents' needs while ensuring confidentiality (Kosteniuk et al., 2013; Ladouceur, 2014). Intervention from professional health workers has the potential to complement or even reinforce community-based programs like PIK-KRR by offering in-depth clinical perspectives that peer counselors may not provide.

Although both PIK-KRR (peer-based approach) and family physicians (medical-professional approach) have the potential to enhance reproductive health knowledge, they often operate independently. To date, research specifically comparing or analyzing the combined effectiveness of PIK-KRR programs with family physician interventions in improving adolescent reproductive health knowledge remains very limited. Furthermore, this study is conducted in a religious-based school environment (MAN 2 Model Medan), where

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reproductive health education may require tailored strategies that align with prevailing values, rendering this study both relevant and context-specific.

Addressing this gap, the present study aims to analyze the effectiveness of the Adolescent Reproductive Health Information and Counseling Center (PIK-KRR) and the role of family physicians in improving adolescents' reproductive health knowledge at MAN 2 Model Medan. The study is expected to contribute theoretically by enriching the scientific literature on effective reproductive health promotion interventions for adolescents in school settings. Practically, the findings are anticipated to provide empirical evidence for MAN 2 Model Medan to strengthen its school health program (UKS), inform government policy formulation on comprehensive reproductive health education, encourage proactive involvement of family physicians in adolescent education, and serve as a reference for future research.

METHODS

This study employed a quantitative methodology with an experimental design and a verificative survey approach to test the proposed hypotheses. Primary data were collected using questionnaires distributed to the respondents. The research was conducted at man 2 model medan during the period from december 2024 to january 2025. The site selection was based on considerations of efficiency, accessibility for the researchers, and the fact that similar research had not previously been carried out at this institution.

The study population comprised all tenth-grade students at man 2 model medan. A total sampling technique was used, whereby the entire population of 55 students meeting the inclusion criteria were included as respondents. The inclusion criteria specified school adolescents who willingly agreed to participate and were proficient in the indonesian language. Exclusion criteria included female students who were pregnant or planning pregnancy during the study period, as well as students with cognitive impairments that could hinder comprehension of the research material.

The independent variables in this study were the effectiveness of the information and counseling center (pik-krr) and the role of the family doctor, measured through an intervention consisting of health education sessions. The dependent variable was the improvement in adolescents' knowledge of reproductive health, assessed via a questionnaire. Knowledge scores were categorized into three levels: "good," "moderate," and "poor," using an interval data scale for further analysis.

The data collection procedure began with obtaining research approval from the researcher's educational institution (unpri) to the administration of man 2 model medan. Upon approval, potential respondents were identified based on the established criteria. The researchers provided a comprehensive explanation regarding the study's objectives, benefits, and procedures before requesting respondents' consent through informed consent forms. During questionnaire completion, respondents were given the opportunity to ask questions. Ethical considerations were strictly upheld by ensuring respondent anonymity through coded identifiers and maintaining confidentiality of all information provided. Participation was voluntary, and respondents retained the right to withdraw at any time.

The collected data were analyzed quantitatively through several stages. The initial stage involved data preparation, including cleaning (completeness check), coding, scoring, and data entry into a computerized database. Statistical data analysis was carried out at three levels. First, univariate analysis was performed to present demographic data and frequency

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distributions of each variable in tables and percentages. Second, bivariate analysis employed the chi-square test to examine the relationship between independent and dependent variables at a significance level of $\alpha = 0.05$. Third, multivariate analysis was conducted using multiple logistic regression to identify the most dominant independent variables influencing the dependent variable. Candidate variables for the multivariate model were selected based on bivariate test results with p-values ≤ 0.25. The final model included only variables with p-values ≤ 0.05. The results of the analyses were presented in both tabular and narrative forms.

Results

This study involved a total of 30 students from MAN 2 Model Medan as the research subjects. Demographic data were collected to provide an overview of the participants. The analyzed subject characteristics included gender and residential status. Based on the collected data, the majority of the subjects were female, totaling 17 individuals (56.7%), while male subjects numbered 13 (43.3%). Regarding residential status, most subjects lived with their parents, accounting for 23 individuals (76.7%). The remaining participants resided either with guardians or relatives (4 subjects, 13.3%) or in boarding houses (3 subjects, 10%). A comprehensive distribution of the participants' demographic characteristics is presented in Table 1.

Table 1. Patient characteristics (n=97)

Variable	n	%
Gender		
Male	13	43,3
Female	17	56,7
Residential Status		
Living with Parents	23	76,7
Living in Boarding House	3	10,0
Living with Guardians/Relatives	4	13,

A specific data analysis was conducted to evaluate the effectiveness of two different interventions on improving adolescents' knowledge of reproductive health. The study participants were divided into two groups, each receiving a distinct intervention: education through the Information and Counseling Center (PIK-KRR) and education delivered via the Family Doctor's role.

The first group, consisting of 15 adolescents, received reproductive health education provided by the PIK-KRR. Prior to the intervention, knowledge levels were predominantly classified as moderate (53.3%) and low (26.7%), with only a minority (20%) demonstrating good knowledge.

Table 2. Comparison of Knowledge Levels Before and After PIK-KRR Education (n=15)

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Knowledge Level	Pre-education		Post-education		p
	n	%	n	%	
Good	3	20,0	10	66,7	
Moderate	8	53,0	5	33,3	0,020
Low	4	26,7	-	-	

The comparison of knowledge levels before and after the intervention is detailed in Table 2.

The comparison of knowledge levels before and after the intervention is detailed in Table 2. Post-intervention, a significant improvement in knowledge was observed. The majority of subjects (66.7%) achieved a good knowledge level, while the remainder (33.3%) scored moderate knowledge. Notably, no subjects remained in the low knowledge category. Statistical analysis using the Wilcoxon signed-rank test yielded a p-value of 0.02. Given that this value is less than the significance level ($\alpha = 0.05$), it can be concluded that education through PIK-KRR significantly improves adolescents' reproductive health knowledge.

The second group, also consisting of 15 adolescents, received the intervention through the involvement of a family doctor. At baseline, the group demonstrated lower initial knowledge levels, with the majority (53.3%) classified as low knowledge, 33.3% as moderate, and only 13.3% as good.

Table 3. Comparison of Knowledge Levels Before and After Family Doctor Intervention (n=15)

Knowledge Level	Pre-education		Post-education		p
	n	%	n	%	
Good	2	13,3	11	73,3	
Moderate	5	33,3	4	26,7	0,020
Low	8	53,3	-	-	

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Following the intervention, a marked improvement was evident. Most participants (73.3%) attained a good knowledge level, with the remaining (26.7%) classified as moderate. Similar to the first group, no subjects remained in the low knowledge category post-intervention. The Wilcoxon signed-rank test again produced a p-value of 0.02 ($p < 0.05$), confirming that the family doctor-led intervention was significantly effective in enhancing adolescents' reproductive health knowledge.

DISCUSSION

This study aimed to evaluate the effectiveness of two distinct educational interventions—education through the Information and Counseling Center for Adolescents (PIK-KRR) and education administered by a family doctor—on improving adolescents' reproductive health knowledge among students at MAN 2 Model Medan. The demographic profile of the participants, predominantly female (56.7%) and mostly residing with parents (76.7%), reflects a typical adolescent population in this context, which is important as both gender and residential status can influence access to health information and support systems. A study on adolescent health care services in Bangladesh revealed that the use of health information and services varies significantly by gender and marital status. BD These differences are shaped by prevailing gender norms and demographic factors, such as whether an adolescent lives with their family, which in turn influences their access to health information and support systems. This highlights that gender and living arrangements are critical factors determining how young people engage with healthcare services (Haseen et al., 2024). Research on adolescent health services in Ghana identified residential status as a factor affecting access and utilization of health services, with many adolescents residing with parents which impacts their support systems (Abuosi & Anaba, 2019).

The baseline knowledge levels in both groups highlighted notable deficiencies, especially within the family doctor intervention group, where over half of the participants (53.3%) exhibited low knowledge. This finding underscores the pressing need for targeted educational programs to address gaps in adolescents' understanding of reproductive health, which aligns with previous studies emphasizing insufficient reproductive health literacy among youth in similar settings. Research highlights the critical need for educational interventions to improve adolescents' reproductive health knowledge, particularly in rural and underserved areas where knowledge gaps are stark (Ali et al., 2025).

Post-intervention analysis demonstrated significant improvements in knowledge levels for both educational approaches. The PIK-KRR intervention resulted in two-thirds of participants (66.7%) attaining good reproductive health knowledge, effectively eliminating the low knowledge category. Similarly, the family doctor-led education yielded an even higher proportion (73.3%) of adolescents reaching a good knowledge status, accompanied by a complete disappearance of low knowledge scores. The statistical significance ($p = 0.02$) for both interventions confirms their efficacy.

These results suggest that both structured peer-based education through PIK-KRR and personalized education by family doctors are effective strategies to enhance adolescents' reproductive health knowledge. The slightly higher improvement observed in the family

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doctor group might indicate the added value of a more personalized, trusted healthcare interaction, potentially fostering better engagement and comprehension. However, the small sample size and relatively homogeneous participant group warrant cautious interpretation, and further studies with larger cohorts could provide a deeper understanding of the differential impacts between these interventions.

Moreover, the complete removal of low knowledge classification post-intervention in both groups is particularly encouraging, as it signals meaningful shifts that could contribute to better reproductive health behaviors and outcomes. Given adolescents' vulnerability to misinformation and risky behaviors, improving knowledge through accessible, acceptable, and varied educational channels is critical. To address this, diverse educational channels are crucial. Text message interventions have shown promise in delivering health information, promoting behavioral changes, and improving adolescents' health status (Hickman & Schaar, 2018). Additionally, enhancing access to information through various social media platforms commonly used by adolescents can increase knowledge and positively influence reproductive health behaviors (Saparini et al., 2023). Parental and educator support is essential, as adolescents often feel more comfortable sharing with peers (Muhlisa et al., 2024). Investing in adolescent health education and prevention strategies is critical, as behaviors established during adolescence can have lifelong consequences (Catalano et al., 2012; Sawyer et al., 2018).

In conclusion, this study supports the implementation of both peer counseling centers and family doctor-led educational initiatives as viable means to promote reproductive health knowledge among adolescents. Future research should explore long-term retention of knowledge gains, possible behavioral changes, and the integration of these interventions into school and community health programs for broader impact.

CONCLUSION

This study concludes that both educational interventions—one delivered through the PIK-KRR and the other by a family doctor—are significantly effective in improving reproductive health knowledge among adolescents at MAN 2 Model Medan. Both methods successfully increased participants' knowledge from a baseline characterized by a considerable proportion of low or moderate understanding, completely eliminating the "low" knowledge category post-intervention. The statistical significance of these improvements was confirmed for both groups, with a p-value of 0.02. These findings underscore the value of both structured, peer-oriented platforms and personalized professional medical guidance as impactful strategies to address critical knowledge gaps in adolescent reproductive health. Therefore, it is recommended that educational institutions and community health programs integrate these dual approaches to enhance health literacy among youth. Future research should examine the long-term retention of acquired knowledge, its translation into positive behavioral changes, and the scalability of these interventions to broader populations.

ACKNOWLEDGEMENT

We sincerely thank all student participants for their contributions, which were pivotal to the successful completion of this study.

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