

The Relationship Between Knowledge and Reproductive Hygiene Practices Among Adolescent Girls at Al Fatih Islamic Boarding School, Sintang, Indonesia: A Cross-Sectional Study

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ABSTRAK

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Latar Belakang: Kebersihan reproduksi merupakan aspek penting dalam kesehatan remaja putri, terutama pada lingkungan pesantren. Kurangnya pengetahuan mengenai kesehatan reproduksi dapat menyebabkan perilaku kebersihan yang tidak optimal sehingga meningkatkan risiko terjadinya infeksi saluran reproduksi dan masalah kesehatan lainnya. **Tujuan:** Penelitian ini bertujuan untuk menganalisis hubungan antara pengetahuan dengan perilaku kebersihan organ reproduksi pada remaja putri di Pondok Pesantren Al Fatih Sintang. **Metode:** Penelitian ini merupakan penelitian observasional analitik dengan desain cross-sectional. Sampel sebanyak 109 responden dari total populasi 150 siswa dipilih menggunakan rumus Slovin dan teknik simple random sampling. Pengetahuan diukur menggunakan kuesioner dengan jawaban benar/salah, sedangkan perilaku kebersihan diukur menggunakan kuesioner perilaku. Analisis data menggunakan uji univariat dan uji Chi-square dengan tingkat signifikansi $p < 0,05$. **Hasil:** Mayoritas responden memiliki pengetahuan baik (56,0%) dan perilaku kebersihan reproduksi yang baik (65,1%). Hasil uji Chi-square menunjukkan terdapat hubungan yang signifikan antara pengetahuan dengan perilaku kebersihan organ reproduksi ($p < 0,001$). Responden dengan pengetahuan yang lebih baik cenderung memiliki perilaku kebersihan yang lebih baik. **Kesimpulan:** Terdapat hubungan yang signifikan antara pengetahuan dengan perilaku kebersihan organ reproduksi pada remaja putri di Pondok Pesantren Al Fatih Sintang. Penguatan edukasi kesehatan reproduksi diperlukan untuk meningkatkan perilaku kebersihan remaja.

ABSTRACT

Keywords:

Adolescents, Boarding school, Cross-sectional study, Knowledge, Reproductive hygiene

Background: Reproductive hygiene is an essential aspect of adolescent health, particularly among female adolescents living in boarding school environments. Limited knowledge regarding reproductive health may contribute to poor hygiene practices, increasing the risk of reproductive tract infections and other health problems. **Objective:** An analysis regarding the association between

*knowledge levels and reproductive hygiene practices among female teenagers at the Al Fatih Islamic Boarding School in Sintang was aimed for in this investigation. **Methods:** A cross-sectional, analytical observational design was adopted to conduct this study. From a total population of 150 students, a baseline sample size of 109 participants was determined and selected via the Slovin formula and simple random sampling. While a true/false questionnaire format was employed to gauge knowledge levels, hygiene habits were evaluated using a specialized behavioral instrument. For the analytical phase, univariate analysis and the Chi-square test were executed, and statistical significance was identified at a p-value threshold of less than 0.05. **Results:** A high level of knowledge was reported in 56.0% of the respondents, while proper reproductive hygiene practices were maintained by 65.1% of the cohort. When the data were analyzed, a significant statistical relationship between knowledge and reproductive hygiene practices was established by the Chi-square test ($\chi^2 = 29.252$, $df = 2$, $p < 0.001$, Cramér's $V = 0.518$). Furthermore, a greater likelihood of exhibiting proper reproductive hygiene behaviors was linked to participants with superior knowledge, compared to their peers with moderate and lower knowledge tiers. **Conclusion:** There is a significant association between knowledge and reproductive hygiene practices among adolescent girls at Al Fatih Islamic Boarding School, Sintang; causal inference cannot be drawn given the cross-sectional design. Strengthening reproductive health education programs is essential to improve adolescents' hygiene behavior.*

Introduction

Adolescence is a critical stage of human development characterized by rapid physical, psychological, and reproductive maturation (Jackson & Goossens, 2020). During this period, female adolescents experience significant physiological changes associated with puberty, including the onset of menstruation, which requires adequate knowledge and appropriate reproductive hygiene practices (Panda et al., 2024). Proper reproductive hygiene is essential for maintaining reproductive health and preventing various health problems, such as reproductive tract infections (RTIs), urinary tract infections (UTIs), abnormal vaginal discharge, and other gynecological disorders (Maqbool et al., 2022). Poor menstrual and reproductive hygiene practices have been identified as important public health concerns, particularly in developing countries where access to reproductive health information remains limited (A. Sharma et al., 2022).

Knowledge is considered one of the primary determinants influencing an individual's health behavior (Mohammed & Larsen-Reindorf, 2020). According to health behavior theory, adequate knowledge contributes to the development of positive attitudes, which subsequently influence healthy behavioral practices (Lambert et al., 2020). Female adolescents with sufficient knowledge regarding reproductive health are more likely to practice appropriate personal hygiene during menstruation and daily activities (Shumie & Mengie, 2022). Conversely, inadequate knowledge may lead to poor hygiene behaviors, increasing the risk of reproductive health problems that may affect quality of life and future reproductive outcomes (Bulto, 2021; Habtegiorgis et al., 2021).

Islamic boarding schools (pesantren) represent a unique educational environment where adolescents spend most of their daily lives in communal settings (Astuti & Winarti, 2026). Such environments require students to maintain high standards of personal hygiene despite challenges related to shared facilities, limited privacy, and varying levels of health education (Mohammed & Larsen-Reindorf, 2020). Consequently, reproductive hygiene among female students in boarding schools deserves particular attention, as inappropriate hygiene practices may facilitate the

transmission of infectious diseases and negatively affect students' health and academic performance (M. K. Sharma et al., 2024).

Several previous studies have reported a significant relationship between reproductive health knowledge and reproductive hygiene behavior among adolescent girls (Kenzi & Anastasya, 2024). However, inconsistent findings have also been documented, with some studies suggesting that knowledge alone is insufficient to produce positive behavioral changes because behavior is also influenced by attitudes, family support, peer influence, cultural beliefs, and the availability of sanitation facilities (Pekrun, 2021). Moreover, most previous studies have been conducted in public schools or urban settings, while evidence regarding female adolescents living in Islamic boarding schools, particularly in rural areas of West Kalimantan, remains limited (Meyer & Simons, 2021).

This limitation indicates a research gap concerning the influence of knowledge on reproductive hygiene behavior among female adolescents residing in pesantren environments. The unique characteristics of Islamic boarding schools, including communal living arrangements, institutional regulations, and religious values, may create different behavioral patterns compared with adolescents in conventional educational settings. Therefore, findings from previous studies may not be fully generalizable to female students living in Islamic boarding schools.

The present study extends previous research by focusing on female adolescents at Al Fatih Islamic Boarding School in Sintang, an educational setting that has received limited scientific attention regarding reproductive hygiene behavior. Unlike previous studies conducted in public schools or urban populations, this study investigates the relationship between knowledge and reproductive hygiene practices within the context of a boarding school where environmental and social factors may influence students' health behavior. This contextual approach represents the novelty of the present study and is expected to provide evidence that supports the development of reproductive health education programs tailored to Islamic boarding school environments.

Based on the background and identified research gap, this study aims to analyze the association between knowledge and reproductive hygiene practices among female adolescents at Al Fatih Islamic Boarding School, Sintang. The findings are expected to contribute to the existing body of knowledge on adolescent reproductive health and provide practical recommendations for educators, healthcare providers, and policymakers in designing effective reproductive health promotion programs for female adolescents in boarding school settings.

Method

Research Design and Approach. To evaluate how knowledge was associated with reproductive hygiene habits among female teenagers, an analytical observational study utilizing a cross-sectional design was executed. Through this specific design, both exposure and outcome parameters were allowed to be measured concurrently during a single timeframe. Additionally, execution of the study was localized to the Al Fatih Islamic Boarding School in Sintang, Indonesia, between September and October 2025.

Population and Sample. The target population was comprised of all 150 female students registered at the school. Based on the Slovin formula with a 5% margin of error, a minimum sample size of 109 participants was calculated. Simple random sampling was employed for participant selection, thereby granting every eligible student an identical chance of inclusion. Inclusion criteria were established for female students who had reached menarche, consented voluntarily to participate, and answered all questionnaire items. Those who were unavailable during the fieldwork phase or submitted finalized questionnaires with missing data were omitted from the analysis.

Research Variables or Study Focus. The independent variable was knowledge regarding reproductive hygiene, whereas the dependent variable was reproductive hygiene practices among female adolescents.

Data Collection Methods and Instruments. Data were collected using a structured self-administered questionnaire. Knowledge regarding reproductive hygiene was measured using a questionnaire consisting of multiple statements with dichotomous response options (correct or incorrect). Each correct answer was assigned a score of one (1), while each incorrect answer received a score of zero (0). The total score was converted into percentages and categorized into three levels: good knowledge ($\geq 76\%$), moderate knowledge (56–75%), and poor knowledge ($\leq 55\%$). Reproductive hygiene practices were measured using a behavioral questionnaire assessing respondents' daily reproductive hygiene practices, including genital hygiene, menstrual hygiene management, frequency of changing sanitary pads, handwashing before and after genital care, and changing underwear regularly. Based on the total score, respondents were categorized as having either good or poor reproductive hygiene practices according to the predetermined cut-off point. Prior to data collection, both questionnaire instruments were subjected to validity and reliability testing. Content validity was established through expert panel review, and internal consistency was assessed using the Cronbach's alpha coefficient, which yielded acceptable reliability values for both instruments.

Research Procedures. Before questionnaires were filled out, a detailed explanation regarding the study's purpose and procedures was delivered to eligible respondents. Voluntary involvement was strictly respected, and participants were guaranteed that all insights would remain confidential and be used exclusively for academic research. Additionally, the risk of response bias was reduced and respondents' anonymity was preserved by administering unsigned questionnaires.

Data Analysis. The collected data were processed using statistical software, which included entry, coding, and analytical stages. A descriptive summary of the respondents' demographic features, knowledge levels, and reproductive hygiene practices was generated through univariate analysis. Frequencies, percentages, means, and standard deviations were calculated to present these metrics appropriately. Additionally, a Chi-square test was performed in the bivariate analysis to assess how knowledge was related to reproductive hygiene practices. A p-value threshold of less than 0.05 and a 95% confidence interval were maintained to identify statistical significance.

Ethical Considerations. To protect human participants, this research strictly followed the ethical guidelines of justice, autonomy, confidentiality, and beneficence. The protocol received formal approval from the Health Research Ethics Committee at STIKES Kapuas Raya Sintang before field implementation. Every respondent joined voluntarily and signed an informed consent form prior to data gathering. Participant privacy and anonymity were strictly maintained during all phases of the study.

Results and Discussion

Results

A total of 109 female adolescents participated in this study, and all respondents completed the questionnaire, resulting in a response rate of 100%.

Respondent Characteristics

The characteristics of the respondents are presented in Table 1. The majority of respondents were 16 years old ($n = 48, 44.0\%$), followed by 15 years old ($n = 37, 33.9\%$) and 17 years old ($n = 24, 22.0\%$). Based on educational level, most respondents were enrolled in Senior High School ($n = 67, 61.5\%$), while the remaining respondents were in Junior High School ($n = 42, 38.5\%$).

Table 1. Characteristics of Respondents (n = 109)

Characteristics	Frequency (n)	Percentage (%)
Age (years)		
15	37	33.9
16	48	44.0
17	24	22.0
Educational level		
Junior High School	42	38.5
Senior High School	67	61.5

Knowledge of Reproductive Hygiene

The distribution of respondents according to their knowledge regarding reproductive hygiene is presented in Table 2. Most respondents demonstrated good knowledge (n = 61, 56.0%), followed by moderate knowledge (n = 32, 29.4%), while poor knowledge was observed in only 16 respondents (14.7%).

Table 2. Distribution of Respondents Based on Knowledge Level

Knowledge Level	Frequency (n)	Percentage (%)
Good	61	56.0
Moderate	32	29.4
Poor	16	14.7
Total	109	100.0

Reproductive Hygiene Practices

The distribution of reproductive hygiene practices is presented in Table 3. A total of 71 respondents (65.1%) demonstrated good reproductive hygiene practices, whereas 38 respondents (34.9%) exhibited poor reproductive hygiene practices.

Table 3. Distribution of Reproductive Hygiene Practices

Practice Category	Frequency (n)	Percentage (%)
Good	71	65.1
Poor	38	34.9
Total	109	100.0

Association Between Knowledge and Reproductive Hygiene Practices

Table 4. Association Between Knowledge and Reproductive Hygiene Practices

Knowledge Level	Good Practice n (%)	Poor Practice n (%)	Total	p-value
Good	52 (85.2)	9 (14.8)	61	
Moderate	16 (50.0)	16 (50.0)	32	
Poor	3 (18.8)	13 (81.2)	16	
Total	71	38	109	<0.001

The Chi-square test demonstrated a statistically significant association between knowledge and reproductive hygiene practices among female adolescents at Al Fatih Islamic Boarding School ($\chi^2 = 29.252$, $df = 2$, $p < 0.001$, Cramér's $V = 0.518$). Respondents with good knowledge were more likely to demonstrate appropriate reproductive hygiene practices compared with those who had moderate or poor knowledge. Conversely, poor reproductive hygiene practices were more frequently observed among respondents with limited knowledge regarding reproductive hygiene.

Discussion

The findings of this study indicate a significant association between knowledge and reproductive hygiene practices among female adolescents at Al Fatih Islamic Boarding School, Sintang ($p < 0.001$). Respondents with good knowledge predominantly demonstrated good reproductive hygiene practices, while those with moderate and poor knowledge were more likely to exhibit inadequate hygiene behaviors. This pattern suggests that knowledge plays an important role in shaping adolescents' reproductive health behaviors, particularly in relation to personal hygiene during menstruation and daily genital care.

The relationship between knowledge and behavior observed in this study can be explained through the Knowledge Attitude Practice (KAP) framework and health behavior theory, which state that knowledge is a fundamental determinant of health-related behavior (F. Alves, 2024). Adequate knowledge enables individuals to understand the importance of reproductive hygiene, recognize potential health risks such as reproductive tract infections, and adopt preventive behaviors (Jiang et al., 2025). In contrast, limited knowledge may lead to misconceptions or lack of awareness regarding proper hygiene practices, thereby increasing the likelihood of poor reproductive health behavior (Zakaria et al., 2020).

The results of this study may also be influenced by the unique environment of Islamic boarding schools, where students live in a communal setting with structured daily routines and shared facilities. In such environments, access to reproductive health information may be limited, and personal hygiene practices are often shaped by peer influence and institutional rules. Students with higher knowledge levels are likely more capable of independently applying appropriate hygiene practices despite environmental constraints, whereas those with lower knowledge may rely more heavily on peer behavior, which may not always be accurate or adequate. The findings of this study are consistent with previous research conducted among adolescent girls, which also reported a significant relationship between reproductive health knowledge and hygiene practices (Kpodo et al., 2022). Several studies have shown that adolescents with better knowledge tend to practice more appropriate menstrual hygiene management, including regular changing of sanitary pads, proper genital cleaning, and maintaining personal cleanliness (Shrestha et al., 2025). These findings reinforce the importance of reproductive health education as a key component in improving adolescent hygiene behavior.



However, some studies have reported that knowledge alone is not always sufficient to ensure good health practices (Alhumaid et al., 2021). Differences in findings across studies may be attributed to variations in environmental conditions, cultural beliefs, parental involvement, access to sanitation facilities, and exposure to health education programs (Jatrana et al., 2021). In some settings, adolescents with adequate knowledge may still demonstrate poor practices due to limited facilities or social norms that restrict open discussion about reproductive health (Ninsiima et al., 2021). This suggests that behavioral change requires not only knowledge improvement but also supportive environmental and social factors.

The findings of this study have important implications for midwifery practice and adolescent health promotion programs. Midwives play a crucial role in providing reproductive health education, particularly in school and community settings. Health education interventions targeting female adolescents in Islamic boarding schools should be strengthened to improve knowledge and promote healthy reproductive hygiene behaviors (Putri & Sansuwito, 2025). In addition, collaboration between healthcare providers, school administrators, and teachers is essential to ensure that students receive accurate and continuous reproductive health information (Wilkins et al., 2022). Improving sanitation facilities within boarding school environments may also support better hygiene practices among students. This study also contributes to the growing body of literature on adolescent reproductive health by focusing on female students in an Islamic boarding school setting, which remains relatively underexplored (Mbizvo et al., 2023). The findings highlight that even within structured religious educational environments, knowledge remains a key determinant of reproductive hygiene behavior. Therefore, this study provides context-specific evidence that can be used to design more effective and culturally appropriate health education programs for adolescents living in boarding schools.

A few limitations were acknowledged in this research, notwithstanding the insights provided. Direct causality between knowledge levels and reproductive hygiene habits could not be inferred due to the cross-sectional nature of the study design. Furthermore, the reliance on self-reported questionnaires meant that the gathered datasets were susceptible to recall bias and social desirability bias. Because the fieldwork was conducted exclusively within one Islamic boarding school, the external validity of the results across alternative settings was limited. Consequently, it was suggested that subsequent studies should involve a more extensive population and investigate confounding variables, including peer support, attitudes, parental influence, and sanitation infrastructure.

Conclusion

This study concludes that there is a significant association between knowledge and reproductive hygiene practices among adolescent girls at Al Fatih Islamic Boarding School, Sintang, within the unique context of an Islamic boarding school. Respondents with higher levels of knowledge tend to demonstrate better reproductive hygiene behaviors compared to those with moderate and low knowledge. These findings indicate that knowledge is significantly associated with reproductive hygiene practices among adolescent girls in Islamic boarding school settings, though causal inference cannot be established given the cross-sectional design. The study emphasizes the importance of strengthening reproductive health education as a preventive strategy to improve adolescent health outcomes.

Recommendations

This study recommends that midwives, educators, and school administrators strengthen structured reproductive health education programs and develop supportive environments to promote appropriate hygiene practices. Furthermore, future research is encouraged to investigate additional psychosocial and environmental factors that may influence reproductive hygiene behaviors among adolescents in similar settings.

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