

Associations of Reproductive Health Knowledge and Attitudes with Menstrual Hygiene Behaviors among Adolescent Girls at Al Muflihun Islamic Boarding School, Malang

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ABSTRACT

Background: Adolescents' emotional responses to menarche tend to vary, including anxiety, confusion, and embarrassment, often linked to their knowledge. Lack of knowledge about reproductive health can influence adolescents' attitudes and behaviors during menstruation. For example, inadequate menstrual hygiene practices may lead to various health issues.

Purpose: This study aimed to examine whether reproductive health knowledge predicts adolescents' attitudes and menstrual hygiene behaviors, and whether attitudes predict menstrual hygiene behaviors among female students at Al Muflihun Islamic Boarding School in Malang.

Methods: This study used a cross-sectional design with an analytic observational approach. A total of 48 female students aged 10–17 years were selected through total sampling. Data were collected using structured questionnaires and analyzed using regression-based path analysis.

Results: Results showed that 68.8% of respondents had good knowledge, 25.0% had moderate knowledge, and 6.3% had poor knowledge. Additionally, all respondents (100%) demonstrated positive attitudes and good behaviors in dealing with menstruation. Regression-based path analysis using continuous questionnaire scores showed that reproductive health knowledge significantly predicted attitude ($\beta=0.675$; $p=0.000$) and behavior ($\beta=0.334$; $p=0.032$), while attitude also predicted behavior ($\beta=0.392$; $p=0.013$).

Conclusion: These findings support Lawrence Green's theory, which states that predisposing factors such as knowledge and attitude affect health behavior. Therefore, more intensive and continuous reproductive health education in schools can improve awareness and menstrual hygiene practices among adolescent girls.

Keywords: Attitude, Behavior, Knowledge, Menstrual Hygiene, Reproductive Health

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BACKGROUND

Adolescence is a period of growth and development toward physical, social, and psychological maturity (Pamangin 2023). One of the signs of puberty in adolescent girls is menarche, which typically occurs between the ages of 11 and 13, with a global prevalence of 18% of the total youth population of approximately 1.2 billion people (WHO, 2020, on Manase et al., 2022). In Indonesia, the highest prevalence of menarche occurs between the ages of 12 and 13 (60%), within an overall range of 9–15 years (Risksedas, 2018).

Adolescents respond to menarche with a variety of emotional reactions, such as anxiety, sadness, disappointment, embarrassment, worry, and confusion. A previous study involving 94 adolescents in Ragawacana Village, Kramatmulya District, Kuningan Regency, showed that 61% of adolescents had negative perceptions, 25% felt confused and surprised, and only 14% had positive perceptions of menarche. These differences in how adolescents perceive menarche are influenced by their knowledge of reproductive health, where 82.8% of adolescents had poor knowledge, while only 17.2% had good knowledge (Septina et al., 2021). This occurs because knowledge can foster an open personality and shape behavior that encourages individuals to take action (Meinarisa et al., 2021).

Poor menstrual hygiene behavior, in which adolescents tend to neglect personal hygiene during menstruation, can negatively affect reproductive health. In a study involving 100 cervical cancer cases, 94.8% of the women in the case group rarely changed sanitary pads compared to 44% in the control group (Singh et.al., 2022). Moreover, poor genital hygiene among adolescents can lead to symptoms such as vaginal itching (20.8%), painful urination (7.8%), and unexplained pelvic pain (11.7%) (Ismail et al., 2022).

Previous studies have reported significant associations between reproductive health knowledge, attitudes, and menstrual hygiene behaviors among adolescents. However, most studies have examined these variables using bivariate analyses; how reproductive health knowledge and attitudes independently contribute to menstrual hygiene behavior when considered simultaneously has not been much analyzed. To address this gap, the present study applied a regression-based path analysis to estimate the direct relationships among reproductive health knowledge, attitudes, and menstrual hygiene behaviors in adolescent girls. This study was conducted at Al Muflihun Islamic Boarding School in Malang, where preliminary observations indicated that reproductive health education has not been formally integrated into the curriculum, highlighting the need to better understand factors associated with appropriate menstrual hygiene behavior in this setting.

OBJECTIVE

This study aimed to examine whether reproductive health knowledge predicts adolescents' attitudes and menstrual hygiene behaviors, and whether attitudes predict menstrual hygiene behaviors among female students at Al Muflihun Islamic Boarding School in Malang.

METHODS

This study employed an analytic observational design using a cross-sectional, point-in-time approach to examine the correlations among reproductive health knowledge, adolescents' attitudes, and behaviors during menstruation. The study was reviewed and approved by the Ethics Committee of the Faculty of Medicine, Universitas Brawijaya (No. 470/EC/KEPK-S1-KB/12/2024). The population in this study included female adolescents aged 10–17 years at Al Muflihun Islamic Boarding School in Malang, with a total of 48 participants. The sampling technique used was non-probability total sampling, meaning all individuals in the population were included if they met the inclusion criteria. The inclusion criteria were:

1. Female adolescents aged 10–17 years at Al Muflihun Islamic Boarding School.
2. Adolescents who had experienced menstruation.
3. Adolescents who agreed to participate and gave consent.
4. Respondents who completed the study.

Reproductive health knowledge was assessed using questionnaires, and the results were categorized based on the percentages of correct answers into good (76-100%), fair (56-75%), and poor (<65%). While attitude and menstrual hygiene behaviors were also measured using questionnaires and categorized into positive and negative for total scores > 50% and < 50%, respectively. Descriptive statistics were presented using categorized knowledge, attitude, and behavior scores in frequencies and percentages. Regression-based path analysis was subsequently performed using the original continuous questionnaire scores to examine the direct effects of reproductive health knowledge on attitudes and menstrual hygiene behaviors, as well as the effect of attitudes on behaviors. Regression-based path analysis was performed using a series of multiple linear regression models. Two regression equations were estimated: (1) reproductive health knowledge predicting attitude, and (2) reproductive health knowledge and attitude jointly predicting menstrual hygiene behavior. Standardized regression coefficients (β), standard errors (SE), 95% confidence intervals (CI), and p-values were reported. A significance level of $\alpha = 0.05$ and a 95% confidence level were used to determine statistically significant relationships. All data analyses were conducted using IBM SPSS software (version 27.0, SPSS Inc., Chicago, IL, USA).

RESULTS

The study involved female adolescents aged 10–17 years, as shown in Table 1, categorized into early adolescence (10–13 years) and middle adolescence (14–17 years). Most respondents (89.5%) were in the early adolescence category. The age of menarche ranged from 10–15 years, with the highest number (45.8%) experiencing menarche at 12 years old. It was shown that out of the 48 research samples, 6.3% of respondents had a low level of reproductive health knowledge, 25.0% had an adequate level of knowledge, and 68.7% had a good level of reproductive health knowledge. All 48 research samples (100% of respondents) in the attitude category demonstrated a positive attitude toward dealing with menstruation. In the behavior category, all 48 research samples (100% of respondents) showed good behavior in dealing with menstruation.

Table 1. Characteristics of Respondents' Age

No	Characteristics	n (%)	p-value
1.	Category		
	Early adolescence	42 (89,5)	
	Middle adolescence	6 (12,5)	
2.	Age		
	10	1 (2,1)	
	11	9 (18,8)	
	12	22 (45,8)	
	13	10 (20,8)	
	14	5 (10,4)	
	15	1 (2,1)	
3.	Category		
	Good	33 (68,7)	
	Poor	3 (6,3)	
	Fair	12 (25)	

3.	Attitude	
	Positive	48 (100)
	Negative	(0)
4.	Behavior	
	Good	48 (100)
	Poor	0 (0)
Total		48 (100)

Regression Analysis of the Relationships Among Reproductive Health Knowledge, Attitudes, and Menstrual Hygiene Behaviors

Regression Test Results of Knowledge on Attitude

Although all respondents were categorized as having positive attitudes and good menstrual hygiene behaviors, the original continuous questionnaire scores showed sufficient variability and were therefore used in the regression-based path analysis. Table 2 shows that the R-squared value is 0.456, indicating that reproductive health knowledge explains 45.6% of the variance in adolescents' attitudes during menstruation at Al Muflihun Islamic Boarding School in Malang. The remaining 54.4% of the variation in respondents' attitudes is influenced by other factors that were not tested in this study. Therefore, it can be concluded that knowledge about reproductive health contributes significantly to shaping adolescents' attitudes in dealing with menstruation at Al Muflihun Islamic Boarding School in Malang.

Table 2. Model Summary of the Linear Regression Analysis of Reproductive Health Knowledge Predicting Attitudes

R	R Square	Adjusted R Square	Std. Error of the estimate
.675 ^a	.456	.444	3.41068

Based on the analysis results in Table 3, it is shown that reproductive health knowledge has a regression coefficient value of 2.58 and a beta coefficient of 0.675 with a p-value of 0.000. Therefore, it can be concluded that reproductive health knowledge has a significant effect on attitude. The regression coefficient of 2.58 indicates that for every 1-point increase in the reproductive health knowledge score, the attitude score will increase by 2.58 points.

Table 3. Regression Coefficients for the Effect of Reproductive Health Knowledge on Attitudes

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	Beta	Std. Error	Beta		
1 (Constant)	30.305	2.429		12.476	.000
Knowledge (X1)	2.576	.415	.675	6.204	.000

Regression Test Results of Knowledge and Attitude Toward Behavior

From the R-squared (R^2) as shown in Table 4, a value of 0.442 was obtained, which means that the influence of reproductive health knowledge and attitude on behavior reaches 44.2%. Meanwhile, the remaining 55.8% of the variation in respondents' behavior is influenced by other factors.

Table 4. Model Summary of the Linear Regression Analysis of Reproductive Health Knowledge and Attitude Predicting Behavior

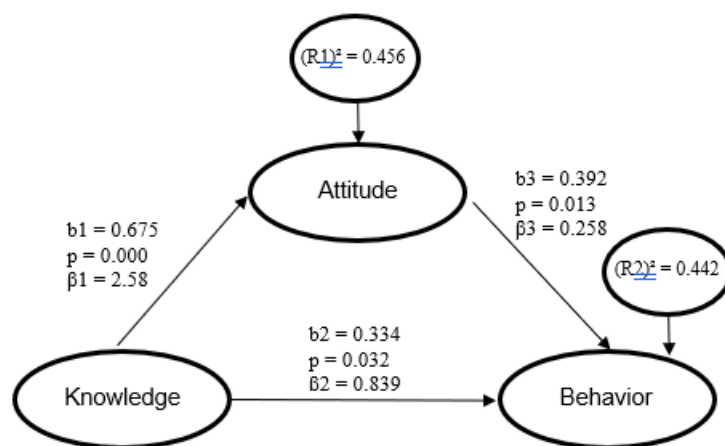
R	R Square	Adjusted R Square	Std. Error of the Estimate
.665 ^a	.442	.417	2.29535

Based on the analysis results in Table 5, it is shown that reproductive health knowledge has a regression coefficient of 0.839 and a beta coefficient of 0.334 with a p-value of 0.032. This indicates that reproductive health knowledge has a significant impact on behavior. In other words, the higher the knowledge score, the more it significantly influences an increase in the behavior score, and vice versa. The regression coefficient of 0.839 means that for every 1-point increase in the reproductive health knowledge score, the behavior score will increase by 0.839 points. Furthermore, attitude has a regression coefficient of 0.258 and a beta coefficient of 0.392 with a p-value of 0.013. This indicates that attitude also has a significant impact on behavior. This means that the higher the attitude score, the more it significantly influences an increase in behavior score, and vice versa. The regression coefficient of 0.258 means that for every 1-point increase in the attitude score, the behavior score will increase by 0.258 points.

Table 5. Regression Coefficients for the Effect of Reproductive Health Knowledge and Attitudes Toward Behavior

	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	Beta	Std. Error	Beta			
1 (Constant)	7.228	3.423			2.112	.040
Knowledge (X1)	.839	.379	.334		2.215	.032
Attitude (Y1)	.258	.099	.392		2.597	.013

To facilitate visualization of the relationships among the study variables, the regression results are summarized in the regression-based path model shown in Figure 1.

**Figure 1.** Hypothesized regression-based path model of the relationships among reproductive health knowledge, attitudes, and menstrual hygiene behaviors.

- b_1 = beta coefficient of the effect of knowledge on attitude
- β_1 = regression coefficient of the effect of knowledge on attitude
- $(R_1)^2$ = R-squared of the effect of knowledge on attitude
- b_2 = beta coefficient of the effect of knowledge on behavior
- β_2 = regression coefficient of the effect of knowledge on behavior
- $(R_1)^2$ = R-squared of the combined effect of knowledge and attitude on behavior

- b_3 = beta coefficient of the effect of attitude on behavior
- β_3 = regression coefficient of the effect of attitude on behavior

DISCUSSION

In this study, it was found that out of a total of 48 adolescents, 33 (68.8%) had good knowledge, 12 (25%) had moderate knowledge, and 3 (6.3%) had poor knowledge. Knowledge is defined as everything known based on an individual's own experiences, and it increases as they accumulate more life experiences. This finding aligned with research on adolescents' knowledge, attitudes, and behavior regarding reproductive health, conducted at SMK Negeri 1 Manado and SMK Kristen Getsemani Manado, where the level of reproductive health knowledge in both schools was classified as good, with 182 respondents (91%) demonstrating a good level of understanding (Sirupa et al., 2016).

The majority of adolescents at Al Muflihun Islamic Boarding School in Malang showed good knowledge of reproductive health. This can be attributed to the fact that the students live in the boarding school environment daily, allowing them greater exposure to information from various surrounding sources. Additionally, the boarding school incorporates Islamic values in its teachings, including the importance of maintaining cleanliness and self-care. As a result, the adolescents at Al Muflihun Islamic Boarding School could apply the knowledge and information they gained to their daily lives. This finding was also supported by previous research on menstrual hygiene behavior among adolescents in a modern Islamic boarding school in Depok City. It is found that 57.1% of female students have high exposure to information, and 72.7% of them have a high or good level of knowledge. This indicates that greater exposure to sources of reproductive health information can lead to better knowledge among female students regarding their reproductive health (Amanda et al., 2020).

In terms of adolescents' attitudes and behaviors, this study revealed that all (100%) of the adolescents have positive attitudes and behaviors in dealing with menstruation. This result was consistent with Sirupa's research, which shows that 96% (192 respondents) of adolescents have good attitudes toward reproductive health. Additionally, another study finds that the personal hygiene behavior of female students at SMPN 1 Sleman, Yogyakarta, during menstruation is generally good, with 61.3% falling into the good category. Positive attitudes and good behavior in managing menstruation were influenced by the respondents' personal experiences with menstruation. Most respondents in this study were between the ages of 13 and 16, with a significant portion (45.8%) experiencing their first menstruation at age 12, which meant they had over a year of experience in managing menstruation and maintaining personal hygiene during their menstrual cycle. Moreover, these findings also aligned with research conducted at SMPN 1 Gamping, Sleman, Yogyakarta, where the majority of respondents demonstrated positive attitudes and behaviors and employed similar age characteristics to this study (Susanti et al., 2020).

These findings were in line with a study in the Savannah Region of Ghana, which revealed that knowledge is associated with adolescent girls' menstrual hygiene practices—76.6% of girls with good knowledge also exhibited positive hygiene practices during menstruation ($p = 0.002$) (Mohammed et al., 2023). This finding was comparable to a study conducted in Pinrang Regency, South Sulawesi, which found that attitude has a significant relationship with personal hygiene behavior during menstruation among adolescent girls. The odds ratio (OR) is 2.63, indicating that compared to those with a positive attitude, girls with a negative attitude were 2.63 times more likely to exhibit poor personal hygiene behavior during menstruation (OR = 2.63; 95% CI: 1.30–5.34) (Mukarramah, 2020).

Attitude is a crucial aspect in shaping an individual's behavior, especially in efforts to maintain personal hygiene during menstruation. According to the Theory of Planned Behavior

(TPB) by Ajzen (1991), a person is more likely to perform a behavior if they believe that the behavior is positive and beneficial for them. Conversely, if they perceive the behavior as negative, unhelpful, or even harmful, they are less likely to engage in that behavior or refuse to perform the behavior (Jarvis Matt, 2019). In this study, all adolescent girls demonstrated positive attitudes and behaviors regarding personal hygiene during menstruation. The researcher assumed that this was because, although the respondents live in a boarding school, they reject myths, cultural beliefs, and traditional taboos surrounding menstruation. This assumption was supported by Notoatmodjo, who states that the beliefs or cultural practices prevalent in a community can influence a person's knowledge and behavior. However, when individuals reject such myths or beliefs—especially those lacking a scientific basis—it can indicate that they possess a higher level of knowledge. In addition, a study shows that adolescents may still hold negative attitudes and behaviors despite having good knowledge. This discrepancy often occurs due to their belief in menstruation-related myths, which take the form of advice or prohibitions believed to be true. A study conducted at a modern Islamic boarding school in Depok found that the majority of female students (90.9%) held myth-based beliefs. Some of the common menstrual hygiene myths among adolescents in that study included: avoiding cutting hair or nails during menstruation, saving fallen hair or nail clippings during menstruation to be washed during ritual purification (ghusl), avoiding brushing or washing the hair while menstruating, belief that used sanitary pads containing menstrual blood should not be discarded carelessly to avoid being haunted by spirits, the need to isolate oneself from the opposite sex during menstruation (Amanda et al., 2020).

The results of the multivariate analysis using path analysis showed a significant relationship between reproductive health knowledge and attitudes toward adolescent behavior in dealing with menstruation at Al Muflihun Islamic Boarding School in Malang. The significant relationship between knowledge, attitudes, and behavior occurs because, in terms of behavior related to menstruation, Lawrence Green (1980) stated that personal hygiene behavior consists of two aspects: behavioral factors (behavior causes) and non-behavioral factors (non-behavior causes). Some factors contributing to the formation of behavior include predisposing factors, such as knowledge and attitudes, which were part of this study. According to Syaifuddin, cited by Nasution (2020), a lack of reproductive health knowledge can affect attitudes and behaviors in a person's life. If knowledge is good, it will positively influence attitudes and behavior, and conversely, if reproductive health knowledge is lacking, the consequences of this will often be neglected (Nasution et al., 2020). This is also supported by Mukarramah's theoretical review, which suggests that one way to reduce issues during menstruation is by habituating personal hygiene behaviors. However, menstruation-related personal hygiene behavior does not happen automatically; it is a process that is learned because individuals understand the positive or negative impacts of such behavior related to menstruation (Mukarramah, 2020).

In addition, the results of this study slightly contradict the previous research, which finds that, at the Modern Islamic Boarding School in Depok, there are more adolescents with negative behaviors and attitudes despite having good knowledge (Amanda et al., 2020). This can be linked to the myths mentioned earlier and also relates to the theory proposed by Bloom (1956), which states that knowledge that influences a person's attitudes and behavior progresses through several stages: first, knowledge (know), understanding (comprehension), application (application), analysis (analysis), synthesis (synthesis), and evaluation (evaluation). Adolescents with high levels of knowledge will be able to understand and apply the information they have effectively, while adolescents with lower levels of knowledge can only know the information but are unable to comprehend or apply it well (Lisa et al., 2022). Therefore, the researcher assumed that the respondents in the previous study had high levels of knowledge

but that their knowledge may have only reached the first stage knowing (know), where they only knew and could explain menstrual hygiene. As a result, even though the knowledge possessed was high, many may have still been unable to apply it effectively.

CONCLUSION

This study showed that reproductive health knowledge played an important role in shaping adolescents' attitudes and behaviors in dealing with menstruation at Al Muflihun Islamic Boarding School in Malang. The analysis revealed that the better the adolescents' understanding of reproductive health, the more positive their attitudes toward menstruation, which ultimately influences their behavior in handling it. Furthermore, positive attitudes also had a significant relationship with adolescents' behavior, indicating that a good understanding and acceptance of menstruation can promote healthier behavior. Additionally, the combination of reproductive health knowledge and attitudes had a proven impact on adolescent behavior, emphasizing that good reproductive health education could be an effective strategy in shaping more adaptive mindsets and actions related to menstruation. Therefore, enhancing education and awareness about reproductive health is essential to help adolescents better cope with menstruation.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest in this research.

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