



Reproductive Health Disorders Among Indonesian Adolescents

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Abstract

Reproductive health disorders, including abnormal vaginal discharge, dysmenorrhea, and urinary tract infections, are common among Indonesian adolescents and are associated with modifiable factors such as poor personal hygiene and limited reproductive health knowledge. This study, conducted in 2025, aimed to determine the prevalence and associated factors of reproductive health disorders and evaluate the effectiveness of an animated audiovisual media-based reproductive health education intervention in improving adolescents' knowledge and self-care practices. A two-phase study comprising a cross-sectional survey and a pre-experimental one-group pretest-posttest design was conducted among 90 tenth-grade students randomly selected from three secondary schools in Lamongan Regency, Indonesia. Data were analyzed using chi-square tests, multivariate logistic regression, and the Wilcoxon Signed-Rank Test. Overall, 78.9% of participants reported at least one reproductive health disorder. Dysmenorrhea was the most common condition (64.4%), followed by abnormal vaginal discharge (60.0%) and urinary tract infection (23.3%). Poor personal hygiene (aOR = 3.84; 95% CI: 1.72–8.57) and low reproductive health knowledge (aOR = 2.61; 95% CI: 1.13–6.03) were significant predictors. Following the intervention, both knowledge and self-care practice scores improved significantly ($p < 0.001$). These findings support integrating structured, media-based reproductive health education into school health programs to promote healthy behaviors and prevent reproductive health disorders among adolescents.

Introduction

Reproductive health disorders represent a substantial and often underrecognized burden among adolescents in low- and middle-income countries (Fitch, 2024; Morgan, Kelland and Cassie, 2024; Esteban *et al.*, 2026). In Indonesia, common conditions such as abnormal vaginal discharge (fluor albus), dysmenorrhea, and urinary tract infections (UTIs) affect a large proportion of adolescent girls (Diarsvitri & Utomo, 2022). Dysmenorrhea alone affects an estimated 64.5% of Indonesian female adolescents, while approximately

45% experience recurrent vaginal discharge. Although frequently dismissed as trivial or “normal,” these conditions can compromise quality of life, school attendance, and psychological wellbeing, and when left untreated may progress to pelvic inflammatory disease, infertility, or other long-term complications (Wu *et al.*, 2022; MacGregor *et al.*, 2023). These disorders are strongly linked to modifiable factors, particularly inadequate reproductive health knowledge and poor personal hygiene practices. Many Indonesian adolescents obtain reproductive health information from

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unreliable peer sources and rarely receive structured education from schools or health services (Karima, Pristya and Herbawani, 2023; Saparini, Simbolon and Ningsih, 2023; Sikoki *et al.*, 2024).

This information deficit perpetuates a cycle in which low literacy contributes to poor self-care, which in turn elevates the risk of reproductive tract infections and related disorders. Despite extensive documentation of the prevalence of individual reproductive health disorders in Indonesia, three gaps remain. First, most studies examine a single condition in isolation rather than profiling the co-occurring spectrum of disorders (vaginal discharge, dysmenorrhea, and UTIs) within one adolescent population (Sari, Utama and Amir, 2024; Sinaga and Silalahi, 2025). Second, few studies simultaneously analyze the factors associated with these disorders and test an intervention to address them, leaving the link between determinants and actionable solutions underexplored ((Situmorang *et al.*, 2024; Darto *et al.*, 2025). Third, evidence integrating prevalence, associated factors, and educational intervention outcomes within a single multi-school study is scarce, particularly in rural and semi-urban Indonesian settings (Imam, 2023; Kusbaryanto *et al.*, 2025).

This study offers an integrated approach by concurrently determining the prevalence of three common reproductive health disorders, identifying their associated factors, and evaluating the outcomes of a structured educational intervention within a single adolescent cohort drawn from three school types (general, vocational, and Islamic senior secondary schools) in Lamongan Regency, East Java. This combined prevalence–determinant–intervention design provides a more comprehensive evidence base than single-focus studies and directly informs school-based reproductive health programming. Accordingly, this study aimed to: (1) determine the prevalence of reproductive health disorders abnormal vaginal discharge, dysmenorrhea, and urinary tract infections among adolescents; (2) identify factors associated with these disorders; and (3) evaluate the outcomes of an educational intervention on adolescents' reproductive health knowledge and self-care

practices. The findings are intended to support evidence-based, school-based reproductive health promotion for Indonesian adolescents.

Methods

This study used a two-phase design within a single adolescent cohort. Phase one applied an analytical cross-sectional approach to determine the prevalence of reproductive health disorders and to identify their associated factors. Phase two applied a pre-experimental one-group pretest-posttest approach to evaluate the outcomes of an educational intervention on reproductive health knowledge and self-care practices. The two phases were conducted sequentially in the same participants, allowing the prevalence and determinant findings to contextualize the intervention outcomes. The overall participant flow is presented in Figure 1. The study was conducted in three secondary schools in Lamongan Regency, East Java, Indonesia, representing a general senior high school (SMA), a vocational high school (SMK), and an Islamic senior high school (MA). This multi-school setting was selected to capture adolescents from diverse academic, socioeconomic, and religious backgrounds. The target population comprised all grade 10 students enrolled in the three schools (N = 450) during the study period.

The sample size was determined using the Slovin formula, $n = N / (1 + Ne^2)$, with a 10% margin of error, yielding a minimum of 90 participants. Participants were recruited through simple random sampling, with 30 students selected proportionally from each school. Every eligible student had an equal and independent probability of selection, minimizing selection bias. Participants were included if they were actively enrolled grade 10 students aged 15–17 years and provided informed assent together with parental or guardian consent. Students were excluded if they were absent during the pretest or posttest, had previously received formal reproductive health education from school or health services, or had any condition that precluded engagement with the educational materials. Participants who withdrew consent at any stage were also excluded from the final analysis.

Data were collected in two stages corresponding to the study phases. In the

cross-sectional phase, the occurrence of three reproductive health disorders—abnormal vaginal discharge (fluor albus), dysmenorrhea, and urinary tract infections (UTIs)—was assessed using a structured questionnaire capturing self-reported symptoms over the preceding three months, alongside data on hypothesized associated factors including age, personal hygiene practices, reproductive health knowledge, and prior exposure to reproductive health information. In the intervention phase, reproductive health knowledge and self-care practices were measured immediately before (pretest) and after (posttest) the educational intervention using validated instruments administered under standardized, supervised conditions. The educational intervention consisted of a structured reproductive health education program delivered through animated audiovisual media covering reproductive

anatomy, hygiene practices, recognition of common disorders, and appropriate self-care and care-seeking behavior. All instruments were pretested for content validity and internal consistency reliability before use.

Data were analyzed using statistical software. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize participant characteristics and to determine the prevalence of each reproductive health disorder. To identify factors associated with the disorders, bivariate analysis was performed using the chi-square test, and variables with $p < 0.25$ were entered into a multivariate logistic regression model to determine independent associations, with adjusted odds ratios (aOR) and 95% confidence intervals reported. For the intervention phase, the normality of knowledge and practice scores was assessed using the Shapiro-Wilk

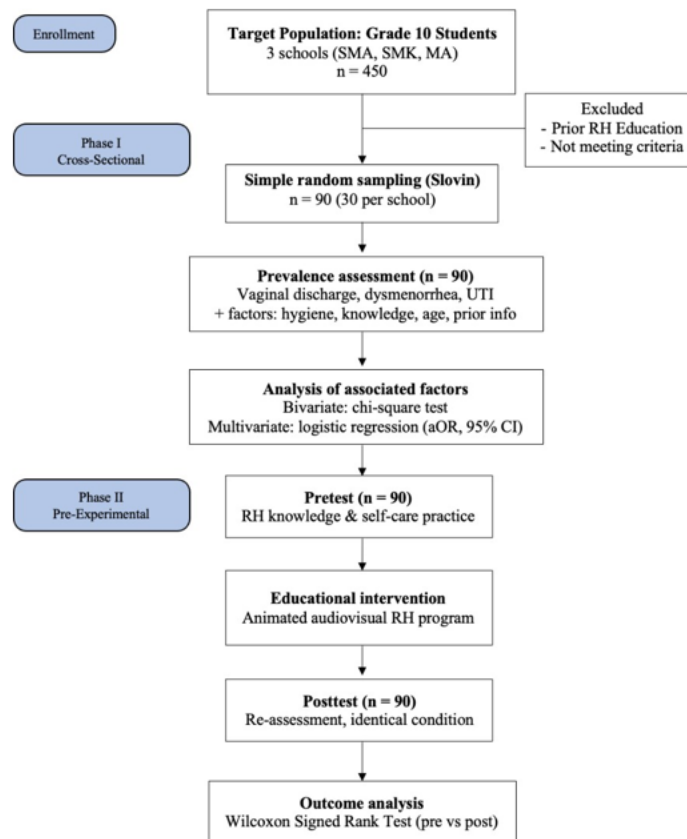


Figure 1. Study flow diagram

test; as the data were not normally distributed, the Wilcoxon Signed-Rank Test was used to compare pretest and posttest scores. Statistical significance was set at $p < 0.05$.

This study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the relevant institutional research ethics committee before data collection, and institutional permission was granted by each participating school (No Protocol: 316.6/II.3.AU/F/KEPK/X/2025). Because all participants were minors, written parental or guardian consent was obtained in addition to participant assent. Participation was voluntary, and participants could withdraw at any time without consequence. No personally identifiable information was recorded; each participant was assigned a unique code to ensure anonymity and confidentiality. All participants received the complete educational program regardless of their phase allocation, ensuring equitable benefit.

Results and Discussion

A total of 90 grade 10 adolescents

participated and completed both study phases (response rate 100%). Participants were evenly distributed across the three school types (30 each; 33.3%). Most were aged 16 years (63.3%). More than half reported poor personal hygiene practices (57.8%), and the majority (72.2%) had never received formal reproductive health (RH) information. Participant characteristics are presented in Table 1.

Within the preceding three months, dysmenorrhea was the most prevalent reproductive health disorder (64.4%), followed by abnormal vaginal discharge (60.0%) and symptom-based urinary tract infection (23.3%). Overall, 78.9% of participants reported experiencing at least one reproductive health disorder, as shown in Table 2.

Bivariate analysis identified poor personal hygiene, low RH knowledge, and no prior RH information as factors significantly associated with the occurrence of reproductive health disorders ($p < 0.05$). In the multivariate logistic regression model, poor personal hygiene (aOR = 3.84; 95% CI 1.72–8.57) and low RH knowledge (aOR = 2.61; 95% CI 1.13–6.03)

Table 1. Characteristics of Study Participants (n = 90)

Characteristic	Category	n	%
Age (years)	15	32	35.6
	16	57	63.3
	17	1	1.1
School type	SMA (General)	30	33.3
	SMK (Vocational)	30	33.3
	MA (Islamic)	30	33.3
Personal hygiene practice	Good	38	42.2
	Poor	52	57.8
Prior RH information	Ever received	25	27.8
	Never received	65	72.2

Source: Primary Data, 2025

Table 2. Prevalence of Reproductive Health Disorders Among Adolescents (n = 90)

Reproductive Health Disorder (last 3 months)	n	Prevalence (%)
Abnormal vaginal discharge (fluor albus)	54	60.0
Dysmenorrhea	58	64.4
Urinary tract infection (symptom-based)	21	23.3
At least one disorder	71	78.9

Source: Primary Data, 2025

remained independent predictors. Age was not significantly associated. Details are presented in Table 3.

Following the educational intervention, both reproductive health knowledge and self-care practice scores improved significantly. Mean knowledge scores increased from 15.23 (SD 2.40) at pretest to 20.51 (SD 1.60) at posttest, and self-care practice scores increased from 9.42 (SD 1.83) to 13.78 (SD 1.49). The Wilcoxon Signed-Rank Test confirmed both improvements were statistically significant ($p = 0.000$), as shown in Table 4.

This study found a high burden of reproductive health disorders among adolescents, with 78.9% reporting at least one disorder in the preceding three months. Dysmenorrhea was the most prevalent (64.4%), followed by abnormal vaginal discharge (60.0%) and symptom-based urinary tract infection (23.3%). These figures are consistent with national estimates indicating that dysmenorrhea affects approximately 64.5% of Indonesian female adolescents and that around 45% of Indonesian women aged 15–24 experience recurrent vaginal discharge. The high prevalence reflects both the physiological vulnerability of adolescence and the influence of Indonesia's tropical climate, which favors the growth of microorganisms associated with

vaginal infections (Gusain *et al.*, 2024; Adriati, Yuliasari and Sari, 2025; Thayib, Yusuf and Salawali, 2026).

Poor personal hygiene emerged as the strongest independent predictor of reproductive health disorders (aOR = 3.84). This finding aligns closely with prior Indonesian studies. A cross-sectional study among female adolescents reported a significant association between personal hygiene and the occurrence of leukorrhea ($p = 0.001$), and similarly found a significant link between hygiene practices and vaginal discharge ($p = 0.016$) (Saadah *et al.*, 2024; Heriani, 2025). The biological plausibility is well established: inadequate genital hygiene, such as improper cleansing direction, infrequent changing of sanitary products, and use of unclean water, creates conditions conducive to microbial overgrowth and reproductive tract infection. These findings are consistent with previous studies showing that inadequate reproductive health literacy and limited school-based reproductive health education contribute to poor personal hygiene practices among adolescents. Strengthening reproductive health education through schools can improve adolescents' health literacy and encourage healthier reproductive behaviors, thereby reducing the risk of reproductive health disorders (Rochmayani D.S., 2020)

Table 3. Between-group comparison of changes in stress and quality of life scores

Factor	Disorder	Disorder		p (bivariate)	aOR (95% CI)	p (adj.)
		+	-			
		(n)	(n)			
Poor personal hygiene		46	6	0.001*	3.84 (1.72–8.57)	0.001*
Low RH knowledge		44	12	0.004*	2.61 (1.13–6.03)	0.025*
No prior RH information		55	10	0.012*	2.18 (0.94–5.07)	0.069
Age (15 vs 16–17 yrs)		24	8	0.214	—	—

Source: Primary Data, 2025

Table 4. Reproductive health knowledge and self-care practice before and after intervention (n = 90)

Outcome	Pretest Mean (SD)	Posttest Mean (SD)	Z	p-value
RH Knowledge	15.23 (2.40)	20.51 (1.60)	−8.05	0.000*
Self-care Practice	9.42 (1.83)	13.78 (1.49)	−7.91	0.000*

* Significant at $p < 0.05$ (Wilcoxon Signed-Rank Test). SD = standard deviation.

(Rochmayani D.S., 2020)(Rochmayani D.S., 2020) (Rochmayani & Budiono, 2020).

Low reproductive health knowledge was also an independent predictor (aOR = 2.61), and lack of prior reproductive health information showed a significant bivariate association. This is consistent with reports that over 80% of Indonesian adolescents lack adequate understanding of reproductive health, largely because information is obtained from unreliable peer sources rather than structured education (Karima, Pristya and Herbawani, 2023; Wulandari *et al.*, 2025; Harjana, Kowara and Januraga, 2026). The interrelationship is cyclical: limited knowledge leads to poor self-care practices, which elevate the risk of disorders. This reinforces the rationale for educational interventions that target knowledge as an upstream determinant of practice (Faruqui *et al.*, 2025; Stennett *et al.*, 2026). Limited access to accurate reproductive health information remains a major challenge for Indonesian adolescents. Many adolescents rely on informal sources of information, resulting in misconceptions regarding puberty, reproductive hygiene, and disease prevention. Providing comprehensive reproductive health education through schools and adolescent-friendly health services can improve knowledge and promote preventive behaviors. Moreover, introducing reproductive health education before adolescence may better prepare young people to manage the physical and psychological changes associated with puberty (Y.N.K., L. and A.A, 2021; R. *et al.*, 2023) (Rizqi *et al.*, 2021; Indraswari *et al.*, 2023). The educational intervention produced statistically significant improvements in both reproductive health knowledge and self-care practices ($p = 0.000$). This corroborates a growing body of evidence that audiovisual and animation-based health education effectively improves adolescent reproductive health outcomes. Previous Indonesian studies have demonstrated that audiovisual media significantly enhance knowledge of leukorrhea and that health education improves personal hygiene practices before and after the intervention (Mariana, 2024; Abu-Ras, Idris and Aboul-Enein, 2025; Suwanphan *et al.*, 2025). The effectiveness of audiovisual approaches is theoretically

supported by their capacity to engage multiple sensory channels, enhancing comprehension and retention compared with conventional methods (Pishghadam *et al.*, 2024; Yi, Dong and Qiao, 2024; Al-Jumaily and Alazzawi, 2025). Educational interventions should not only increase knowledge but also encourage sustainable behavioral changes through collaboration among schools, families, and healthcare providers. Integrating multimedia-based reproductive health education with adolescent-friendly health services may strengthen self-care practices and improve adolescents' reproductive health outcomes (Hermawan *et al.*, 2023; Prabamurti *et al.*, 2024; Lufthiani *et al.*, 2023). Taken together, these findings demonstrate a clear pathway from determinants to solution: the disorders are common, they are driven by modifiable factors (hygiene and knowledge), and a targeted educational intervention can address these factors. This integrated evidence supports the incorporation of structured, media-based reproductive health education into school health programs, particularly in settings where adolescents have limited access to formal reproductive health information. Overall, the present findings indicate that strengthening reproductive health literacy through structured school-based education and supportive health services is an effective strategy for improving adolescents' knowledge, personal hygiene practices, and reproductive health outcomes (Rochmayani & Budiono, 2020; Rizqi *et al.*, 2021).

Conclusion

Reproductive health disorders are highly prevalent among Indonesian adolescents, with poor personal hygiene and low reproductive health knowledge identified as key independent predictors. A structured, media-based educational intervention significantly improved adolescents' reproductive health knowledge and self-care practices. These findings underscore the importance of integrating targeted reproductive health education into school-based health programs to address the modifiable determinants of reproductive health disorders. Strengthening reproductive health literacy and hygiene practices among adolescents represents

a practical and scalable strategy to reduce the burden of these disorders and promote long-term reproductive well-being.

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