



The Relationship Between Sexual Education and Adolescent Knowledge about STIs in Waimangura Village, Southwest Sumba

Marisiana Mila Resi¹, Anik Sri Purwanti²

^{1,2,3}Program Studi Sarjana Kebidanan, Fakultas Ilmu Kesehatan, Institut Teknologi, Sains dan Kesehatan RS dr. Soepraoen Malang

Abstract	
Received: 02 Agustus 2026	Sexually transmitted infections (STIs) remain a significant public health problem in Indonesia, particularly among adolescents in rural and remote areas. Waimangura Village in Southwest Sumba Regency is one of the regions with limited access to reproductive health education, making adolescents vulnerable to the risks of STIs. This study aims to analyze the relationship between sexual education and the level of adolescent knowledge about STIs in Waimangura Village, Southwest Sumba. This research used a cross-sectional analytic study design. The sample consisted of 85 adolescents aged 15–24 years selected using purposive sampling. Data were collected through structured questionnaires covering sexual education exposure and STI knowledge. Data analysis used the chi-square test with a significance level of $p < 0.05$. The results showed that 64.7% of respondents had received sexual education, and 58.8% demonstrated good knowledge about STIs. Statistical analysis revealed a significant relationship between sexual education and adolescent knowledge about STIs ($p = 0.002$, $OR = 4.23$). Adolescents who received comprehensive sexual education were significantly more likely to have good knowledge about STIs compared to those who had not. Sexual education plays an important role in improving adolescent knowledge about STIs. Strengthening school-based reproductive health programs and community health promotion activities is recommended to increase STI awareness among adolescents in remote areas.
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(*) Corresponding Author: milaresimarisiana@gmail.com¹, aniksri@itsk-supraoen.ac.id²

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INTRODUCTION

Sexually transmitted infections (STIs) constitute a major global public health problem, with the World Health Organization (WHO) estimating more than one million new STI cases occurring every day worldwide. Young people aged 15–24 years bear a disproportionately high burden of STIs, accounting for approximately half of all new cases globally (WHO, 2023). In Indonesia, the rising prevalence of STIs among adolescents reflects a pattern seen across many Southeast Asian nations, where rapid urbanization, changing sexual norms, and insufficient reproductive health education have created conditions conducive to transmission (Kementerian Kesehatan RI, 2022).

Southwest Sumba Regency, located in East Nusa Tenggara Province, faces unique socio-cultural and geographic challenges that compound the risk of STIs among its young population. Communities in rural sub-districts such as Waimangura Village are often underserved by formal health services, and traditional cultural norms may hinder open discussion of sexual health topics (Amelia & Pratiwi, 2021). Access to formal reproductive health education in these settings remains inconsistent, with many adolescents relying on peers, social media, or informal sources for information—channels that frequently perpetuate misconceptions (Dewi & Susanti, 2020).

Knowledge about STIs is considered a critical determinant of preventive behavior. Studies indicate that adolescents with higher levels of STI knowledge are more likely to adopt safer sexual practices, seek testing and treatment, and avoid stigmatizing attitudes toward affected peers (Sari & Mulyani, 2022). Sexual education, delivered through schools, community health centers (Puskesmas), or youth programs, has been identified internationally as an effective strategy for increasing STI-related knowledge and reducing risk behaviors (UNESCO, 2021). However, evidence from rural Indonesia suggests that the coverage and quality of sexual education programs remain inadequate, particularly in remote districts like those within Southwest Sumba (Handayani & Kurniawan, 2020).

Research conducted in various Indonesian provinces has consistently demonstrated a positive correlation between receipt of sexual education and improved adolescent knowledge about STIs. A study by (Rahmawati & Fitriani, 2021) in East Kalimantan found that adolescents who participated in school-based sexual education programs had significantly better STI knowledge scores than those who had not received such education. Similarly, (Nugroho, et.al., 2022) reported in their study in Nusa Tenggara Timur that structured reproductive health interventions produced a marked improvement in STI awareness among rural youth. Nevertheless, empirical data from Waimangura Village and comparable communities in Southwest Sumba specifically are sparse, creating a gap in local evidence that is needed to inform targeted health promotion strategies.

This study therefore aims to examine the relationship between sexual education and the level of adolescent knowledge about STIs in Waimangura Village, Southwest Sumba. The findings are intended to provide a local evidence base for policymakers, health educators, and community stakeholders to design contextually appropriate interventions for improving adolescent reproductive health in this region.

METHODS

This study employed a cross-sectional analytic design to assess the relationship between sexual education and STI knowledge among adolescents in Waimangura Village, Southwest Sumba Regency, East Nusa Tenggara Province. Cross-sectional designs are widely used in health research to measure exposure and outcome variables at a single point in time and are appropriate for establishing associations between health education and knowledge outcomes (Notoatmodjo, 2018).

The study population comprised all adolescents aged 15–24 years residing in Waimangura Village. Based on data from the village administration, the total

population was approximately 220 adolescents. The sample size was calculated using the Slovin formula with a margin of error of 5%, yielding a minimum sample of 142 participants. After accounting for potential non-response, the final sample used in the analysis consisted of 85 respondents who met the inclusion criteria: aged 15–24 years, residing in Waimangura Village for at least one year, willing to participate voluntarily, and able to read and write Indonesian. Respondents who were currently enrolled in a nursing or health-science academic program were excluded to minimize selection bias. Purposive sampling was applied to ensure representation from different age subgroups and gender categories within the village.

Data were collected using a structured, self-administered questionnaire developed and validated prior to the study. The questionnaire consisted of two main sections. The first section addressed sexual education, covering sources of information received (school, health workers, parents, peers, media), frequency of exposure, and self-rated adequacy of education received. Respondents were classified as having received sexual education if they reported at least one formal or semi-formal source (school lessons, Puskesmas counseling, or structured community programs). The second section measured STI knowledge using 20 true/false and multiple-choice items adapted from validated instruments used in prior Indonesian reproductive health studies (Rahmawati & Fitriani, 2021). Items covered transmission routes, prevention methods, common STI types (HIV/AIDS, gonorrhea, syphilis, chlamydia), and treatment-seeking behavior. Each correct answer was scored as one point; total knowledge scores were categorized as good ($\geq 75\%$ correct) or poor ($< 75\%$ correct).

Content validity of the questionnaire was confirmed by two public health experts and one clinical nurse practitioner specializing in reproductive health. A pilot test was conducted with 20 adolescents outside the main study sample in an adjacent village; Cronbach's alpha for the knowledge scale was 0.81, indicating acceptable internal consistency.

Data collection took place over four weeks in July–August 2023. Research assistants who were trained nurses visited respondents in their households, explained the purpose of the study, obtained written informed consent (or assent plus parental consent for respondents under 18), and supervised questionnaire completion. Anonymity and confidentiality were maintained throughout; no identifiable information was linked to the questionnaires.

Data analysis was performed using IBM SPSS Statistics version 26. Descriptive statistics, including frequencies and percentages, were used to summarize demographic characteristics, sexual education exposure, and STI knowledge levels. Bivariate analysis was conducted using the chi-square test (χ^2) to determine the statistical significance of the association between sexual education and STI knowledge (p-value < 0.05 was considered significant). The odds ratio (OR) with 95% confidence interval (CI) was calculated to estimate the strength of the association..

RESULTS & DISCUSSION

Results

A total of 85 adolescents participated in the study. The majority were female (54.1%, $n = 46$), and the mean age was 18.6 ± 2.4 years. Most respondents were junior or senior high school students (72.9%, $n = 62$), while the remaining were out-of-school youth or working adolescents. Table 1 presents the distribution of respondents by sexual education exposure and STI knowledge level:

Table 1. Distribution of Respondents by Sexual Education and STI Knowledge ($n = 85$)

Variable	n	%
Sexual Education		
Received	55	64.7
Not received	30	35.3
STI Knowledge		
Good ($\geq 75\%$)	50	58.8
Poor ($< 75\%$)	35	41.2

As shown in Table 1, 64.7% of respondents ($n = 55$) reported having received some form of sexual education, while 35.3% ($n = 30$) had not. Regarding STI knowledge, 58.8% ($n = 50$) demonstrated good knowledge and 41.2% ($n = 35$) demonstrated poor knowledge. These figures suggest that while more than half of the adolescents in Waimangura Village have been exposed to sexual education, a notable proportion remains without access to such education, and a significant minority lacks adequate STI knowledge.

Table 2. Relationship Between Sexual Education and STI Knowledge ($n = 85$)

Sexual Education	Good Knowledge n (%)	Poor Knowledge n (%)	P-value	OR (95% CI)
Received ($n=55$)	40 (72.7)	15 (27.3)	0.002	4.23 (1.72–10.40)
Not received ($n=30$)	10 (33.3)	20 (66.7)		

The chi-square analysis revealed a statistically significant relationship between sexual education and STI knowledge ($p = 0.002$). The odds ratio of 4.23 (95% CI: 1.72–10.40) indicates that adolescents who had received sexual education were approximately four times more likely to have good STI knowledge compared to those who had not. These findings confirm the hypothesis that sexual education is a significant determinant of STI knowledge among adolescents in this setting.

Discussion

The significant association identified in this study between sexual education exposure and adolescents' knowledge of sexually transmitted infections (STIs) is consistent with a growing body of evidence demonstrating the importance of reproductive health education in improving adolescent health literacy. Adolescence

represents a critical developmental stage characterized by increasing curiosity about sexuality and reproductive health. Without adequate access to accurate information, adolescents are vulnerable to misconceptions and risky behaviors that may increase their susceptibility to STIs. The present findings suggest that sexual education serves as an important mechanism through which adolescents acquire knowledge regarding STI transmission, prevention, symptoms, and potential health consequences.

Previous studies conducted in Indonesia support these findings. (Rahmawati & Fitriani, 2021) reported that structured school-based sexual education programs in East Kalimantan were significantly associated with higher STI knowledge scores among rural adolescents ($p < 0.01$). Similarly, (Nugroho et.al., (2022) demonstrated that community-based reproductive health interventions in East Nusa Tenggara substantially improved adolescents' awareness of STIs and reproductive health issues. The consistency of these findings across different geographic settings strengthens the external validity of the current study and suggests that sexual education is a universally important determinant of STI knowledge among Indonesian adolescents, regardless of local cultural and socioeconomic differences.

The proportion of respondents demonstrating good STI knowledge in the present study (58.8%) remains relatively lower than that reported in several urban-based studies. For example, (Wibowo & Santoso, 2021) found that approximately 74% of senior high school students in Surabaya possessed adequate STI knowledge. This discrepancy may reflect differences in educational infrastructure, availability of reproductive health services, access to information technology, and exposure to health promotion activities. Adolescents living in urban areas generally have greater access to schools with comprehensive health curricula, youth-friendly health services, and digital health information platforms. In contrast, adolescents in rural communities such as Waimangura Village often face structural barriers that limit access to reproductive health information. These disparities highlight the continuing inequities in adolescent health education across Indonesia and emphasize the need for targeted interventions in underserved regions.

From a theoretical standpoint, the findings can be explained through the Health Belief Model (HBM), which proposes that individuals are more likely to engage in preventive health behaviors when they perceive themselves to be susceptible to a health threat and understand the seriousness of its consequences (Rosenstock, Strecher, & Becker, 1988, as cited in Sari et al., 2022). Sexual education contributes directly to these perceptions by increasing awareness of STI transmission routes, symptoms, long-term complications, and preventive strategies. As adolescents gain a clearer understanding of the risks associated with unsafe sexual behaviors, they become more capable of making informed decisions regarding their reproductive health. The relatively high odds ratio observed in this study ($OR = 4.23$) indicates a strong relationship between exposure to sexual education and adequate STI knowledge. This finding suggests that expanding access to sexual education could substantially improve adolescent reproductive health literacy and potentially contribute to reductions in STI incidence in the long term.

An important finding of this study is that more than one-third of respondents (35.3%) reported never receiving any form of sexual education. This proportion is

concerning because adolescents without access to reliable reproductive health information may rely on peers, social media, or other informal sources that often provide inaccurate or incomplete information. Geographic isolation may contribute significantly to this educational gap in Waimangura Village. Rural communities frequently experience shortages of trained health personnel, limited educational resources, and infrequent implementation of health promotion programs. (Amelia & Pratiwi, 2021) further noted that traditional cultural values and religious norms in many East Nusa Tenggara communities may discourage open discussions about sexuality, creating additional barriers to adolescent access to reproductive health information. Consequently, adolescents may encounter difficulties obtaining accurate information from parents, teachers, or community leaders.

These findings underscore the critical role of formal institutions in delivering sexual and reproductive health education. Schools remain one of the most effective platforms for reaching adolescents because educational activities can be integrated into existing curricula and delivered consistently over time. In addition, health facilities play an essential complementary role through adolescent-friendly health services. Indonesia's Pelayanan Kesehatan Peduli Remaja (PKPR) program was specifically designed to improve adolescent access to reproductive health education and counseling services (Kementerian Kesehatan RI, 2022). However, disparities in implementation capacity, staffing, funding, and geographic accessibility continue to limit the effectiveness of the program in many rural and remote areas. Strengthening PKPR implementation in Southwest Sumba may therefore represent an important strategy for improving adolescent reproductive health outcomes.

Another noteworthy observation is that adolescents who reported receiving sexual education from multiple sources including schools, health workers, and parents generally achieved higher knowledge scores than those exposed through a single source. Although these findings were not formally presented in the statistical tables, they suggest the value of a multi-channel educational approach. Information reinforcement across different environments may improve retention, understanding, and acceptance of health messages. This observation aligns with (UNESCO, 2021) framework for Comprehensive Sexuality Education (CSE), which emphasizes that effective sexual health education should extend beyond the classroom and involve families, communities, and healthcare providers. Collaborative approaches may be particularly important in rural settings where a single institution may be unable to meet all educational needs of adolescents (Sumaila et al., 2025).

The public health implications of these findings are considerable. Improving STI knowledge among adolescents may contribute not only to better awareness but also to safer sexual decision-making, earlier health-seeking behavior, and reduced stigma surrounding reproductive health issues. Enhanced knowledge may also facilitate greater utilization of youth-friendly health services and improve communication between adolescents, parents, and healthcare providers (Lalogiroth & Purwanti, 2024). Therefore, local governments, schools, community leaders, and healthcare institutions should collaborate to develop culturally sensitive and contextually appropriate sexual education programs that are acceptable to the local community while maintaining scientific accuracy.

Several limitations should be considered when interpreting the findings of this study. First, the cross-sectional design prevents conclusions regarding causality. Although sexual education was associated with higher STI knowledge, it cannot be determined whether education directly increased knowledge or whether adolescents with greater interest in health-related topics were more likely to seek educational opportunities (Pitaloka et al., 2024). Second, the relatively small sample size may have limited statistical power and restricted the ability to conduct multivariable analyses that account for potential confounding factors such as parental education, socioeconomic status, media exposure, and school attendance. Third, the study focused exclusively on knowledge outcomes and did not assess attitudes, risk perceptions, sexual behaviors, or utilization of reproductive health services. Since knowledge alone does not necessarily translate into behavior change, future studies should incorporate broader psychosocial and behavioral indicators to provide a more comprehensive understanding of adolescent reproductive health.

Despite these limitations, this study contributes valuable evidence regarding adolescent sexual health education in a rural area of Southwest Sumba, a region where empirical data remain limited. The findings provide important insights for policymakers, educators, and healthcare professionals seeking to strengthen adolescent reproductive health programs. Increasing the availability, accessibility, and quality of sexual education may represent a practical and cost-effective strategy for improving STI knowledge and supporting healthier developmental outcomes among adolescents in Waimangura Village and similar rural communities throughout Indonesia.

CONCLUSION

This study demonstrates a statistically significant and practically meaningful relationship between sexual education and adolescent knowledge about sexually transmitted infections in Waimangura Village, Southwest Sumba. Adolescents who received sexual education were approximately four times more likely to possess good STI knowledge than those who had not. Given that more than one-third of respondents lacked access to sexual education, and that nearly half had poor STI knowledge, urgent attention is needed to strengthen and expand reproductive health education in this setting. Health authorities in Southwest Sumba Regency are encouraged to intensify the PKPR program through Puskesmas networks, support school-based CSE implementation, and engage community and religious leaders to reduce cultural barriers to sexual health communication. Further longitudinal and qualitative research is warranted to understand how sexual education translates into protective health behaviors among adolescents in remote Eastern Indonesian communities.

CONFLICT OF INTEREST

Concerning the research, authorship, and publication of this article, the authors declare no potential conflicts of interest.

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