



The Association between Reproductive Health Literacy and Preventive Sexual Behavior among Adolescents: A Cross-Sectional Study

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ABSTRACT

Adolescent sexual and reproductive health remains a major public health concern, particularly as limited reproductive health literacy may increase vulnerability to risky sexual behaviors and adverse health outcomes. This study aimed to examine the association between reproductive health literacy and preventive sexual behavior among adolescents. A cross-sectional study design was employed among adolescent students using a structured, self-administered questionnaire. Reproductive health literacy was assessed through dimensions of access, understanding, appraisal, and application of reproductive health information. At the same time, preventive sexual behavior was measured based on practices related to avoiding risky sexual activity, seeking reliable information, communicating about reproductive health, and utilizing appropriate health services. Data were analyzed using descriptive statistics and inferential tests to determine the relationship between reproductive health literacy and preventive sexual behavior. The findings indicated that adolescents with higher reproductive health literacy were more likely to demonstrate positive preventive sexual behaviors than those with lower literacy levels. Exposure to reproductive health information, school-based education, and family communication also appeared to support healthier decision-making. These findings suggest that reproductive health literacy is an important factor in promoting preventive sexual behavior among adolescents. Strengthening comprehensive reproductive health education and improving access to adolescent-friendly health information are essential strategies for reducing reproductive health risks.

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INTRODUCTION

Adolescence is a critical developmental period characterized by rapid biological, psychological, and social transitions that shape health-related attitudes and behaviors across the life course [1][2]. During this stage, adolescents begin to develop greater autonomy, form intimate relationships, and make decisions that may influence their sexual and reproductive health [3]. However, many adolescents continue to face limited access to accurate reproductive health information, inadequate communication with parents or health professionals, and social norms that restrict open discussion about sexuality [4]. These barriers may increase adolescents' vulnerability to misinformation, risky sexual behavior, unintended pregnancy, sexually transmitted infections, and other adverse reproductive health outcomes [5].

Reproductive health literacy has emerged as an important determinant of adolescents' ability to make informed and responsible decisions regarding their sexual and reproductive health [6]. It refers not only to the ability to access reproductive health information but also to the ability to understand, evaluate, and apply that information in daily life [7]. Adolescents with adequate reproductive health literacy are expected to be better equipped to recognize reproductive health risks, seek reliable information, communicate effectively about sexual health, and use preventive measures when needed. In contrast, low reproductive health literacy may limit adolescents' capacity to distinguish credible health information from misinformation, particularly amid increasing exposure to digital media and peer-based sources [8]. Preventive sexual behavior is a key component of adolescent reproductive health promotion. Such behavior includes avoiding risky sexual practices, delaying sexual initiation, using appropriate protection, seeking reproductive health counseling, and accessing adolescent-friendly health services [4]. Although comprehensive sexuality education and reproductive health services have been widely recommended to support adolescents' well-being, the effectiveness of these efforts depends partly on adolescents' ability to comprehend and use the information provided [9]. Therefore, reproductive health literacy may serve as a crucial pathway through which education and health communication influence preventive sexual behavior.

Previous studies have commonly examined adolescent reproductive health knowledge, attitudes, or sexual risk behaviors as separate constructs [10]. However, knowledge alone may not be sufficient to explain preventive behavior, as adolescents also require the skills to interpret information, assess risks, and translate knowledge into action [11]. The concept of reproductive health literacy provides a broader framework for understanding how adolescents process and use reproductive health information [2]. Despite its importance, empirical evidence regarding the association

between reproductive health literacy and preventive sexual behavior among adolescents remains limited, particularly in school-based adolescent populations [1].

Understanding this association is important for designing more effective reproductive health education and intervention programs. If reproductive health literacy is significantly associated with preventive sexual behavior, strengthening literacy-based approaches may help improve adolescents' capacity to make safer and healthier decisions [6]. Therefore, this study aims to examine the association between reproductive health literacy and preventive sexual behavior among adolescents using a cross-sectional study design. The findings are expected to inform evidence-based strategies to improve adolescent reproductive health education, promote preventive behaviors, and reduce reproductive health risks among young people.

METHOD

Study Design

This study employed an analytical cross-sectional design to examine the association between reproductive health literacy and preventive sexual behavior among adolescents. In this design, reproductive health literacy as the independent variable and preventive sexual behavior as the dependent variable were measured at the same time. This approach was considered appropriate for identifying relationships among variables in a school-based adolescent population.

Study Setting

The study was conducted at a senior high school. The school was selected because senior high school students are in a critical developmental period in which knowledge, attitudes, and behaviors related to reproductive health begin to develop. Data collection was conducted in the school setting after obtaining permission from the school authority. The questionnaire was administered according to an agreed schedule to avoid disruption to teaching and learning activities.

Population and Sample

The study population consisted of students enrolled at the selected senior high school. The study sample included 120 adolescents who met the inclusion criteria. The inclusion criteria were students who were actively enrolled at the school, aged approximately 15–18 years, willing to participate voluntarily, and able to complete the questionnaire independently. Students who were absent during data collection, declined participation, or submitted incomplete questionnaires were excluded from the study.

The sample was selected using a proportionate sampling technique based on grade level. This technique was used to ensure that students from different grades were adequately represented in the study. The final sample consisted of 120 respondents.

Study Variables

The independent variable was reproductive health literacy. Reproductive health literacy was defined as adolescents' ability to access, understand, appraise, and apply information related to reproductive health. The dependent variable was preventive sexual behavior, defined as adolescents' behaviors aimed at preventing sexual and reproductive health risks. These behaviors included avoiding risky sexual practices, seeking accurate reproductive health information, communicating with trusted people, and using appropriate reproductive health services when needed. Demographic characteristics were also collected, including age, sex, grade level, source of reproductive health information, exposure to reproductive health education, and communication with parents or guardians regarding reproductive health.

Research Instruments

Data were collected using a structured self-administered questionnaire. The questionnaire consisted of three sections. The first section included respondents' demographic characteristics. The second section measured reproductive health literacy using an adapted questionnaire. The third section measured preventive sexual behavior using an adapted safer sexual behavior questionnaire. Reproductive health literacy was measured based on four dimensions: access to reproductive health information, understanding of reproductive health concepts, appraisal of reproductive health information, and application of reproductive health information in daily decision-making. Preventive sexual behavior was assessed using items related to risk avoidance, information-seeking, communication about reproductive health, awareness of reproductive health services, and intention to engage in protective health behaviors. Responses were measured using a Likert scale. Higher scores indicated better reproductive health literacy and more positive preventive sexual behavior.

Validity and Reliability of the Instruments

This study used previously validated instruments. Reproductive health literacy was measured using the Reproductive Health Literacy Questionnaire for Chinese Unmarried Youth, developed by Ma et al., comprising 58 items. The instrument demonstrated strong reliability, with Cronbach's alpha of 0.919, Guttman split-half reliability of 0.846, and test-retest reliability coefficient of 0.720. Preventive sexual behavior was measured using an adapted Safe Sex Behavior Questionnaire developed by Dilorio et al. The instrument has been reported to have strong content

validity (98% content validity index) and acceptable internal consistency (Cronbach's alpha of 0.82).

Both instruments were translated and culturally adapted to fit the Indonesian senior high school context. The adapted questionnaire was reviewed by experts in public health, reproductive health, and adolescent health to ensure clarity, relevance, and cultural appropriateness before data collection.

Data Collection Procedure

Data collection was conducted after obtaining permission from the school authority. Before completing the questionnaire, students were informed about the purpose of the study, the voluntary nature of participation, confidentiality of responses, and their right to withdraw from the study at any time. The questionnaire was distributed in the classroom under the researcher's supervision. Respondents were asked to complete the questionnaire independently to minimize discussion or peer influence. The researcher provided general instructions before data collection and answered procedural questions when needed. Completed questionnaires were checked for completeness before data entry.

Data Analysis

Data were analyzed using statistical software. Descriptive statistics were used to summarize respondents' demographic characteristics, reproductive health literacy, and preventive sexual behavior. Categorical data were presented as frequencies and percentages, while numerical data were presented as mean and standard deviation or median and interquartile range, depending on data distribution. Bivariate analysis was conducted to examine the association between reproductive health literacy and preventive sexual behavior. The chi-square test was used when both variables were categorized. If the variables were analyzed as numerical scores, Pearson or Spearman correlation was used, depending on the data's normality. A p-value of less than 0.05 was considered statistically significant. To control for potential confounding variables, logistic regression analysis was conducted. Variables such as age, sex, grade level, exposure to reproductive health information, and parent-adolescent communication were considered in the model. The results were presented as odds ratios, 95% confidence intervals, and p-values.

RESULT AND DISCUSSION

Result

A total of 120 senior high school students participated in this study, and all questionnaires were included in the final analysis. The respondents were aged between 15 and 18 years, with a mean age of 16.33 ± 0.93 years. Most respondents were female (55.0%), and the distribution of students by grade level was relatively

balanced. More than two-thirds of respondents had previously received reproductive health education, while less than half reported having communication with parents or guardians about reproductive health issues.

Table 1. Demographic Characteristics of Respondents

Characteristics	Frequency (n)	Percentage (%)
Age		
15 years	26	21.7
16 years	43	35.8
17 years	37	30.8
18 years	14	11.7
Sex		
Male	54	45.0
Female	66	55.0
Grade level		
Grade X	42	35.0
Grade XI	40	33.3
Grade XII	38	31.7
Previous exposure to reproductive health education		
Yes	82	68.3
No	38	31.7
Communication with parents/guardians about reproductive health		
Yes	51	42.5
No	69	57.5
The main source of reproductive health information		
School	45	37.5
Internet/social media	38	31.7
Health workers	17	14.2
Parents/family	12	10.0
Peers	8	6.7

The distribution of reproductive health literacy and preventive sexual behavior is presented in Table 2. Most respondents had a high level of reproductive health literacy (62.5%). Similarly, 66.7% of respondents demonstrated positive preventive sexual behavior.

Table 2. Distribution of Reproductive Health Literacy and Preventive Sexual Behavior

Variable	Category	Frequency (n)	Percentage (%)
Reproductive health literacy	Low	45	37.5
	High	75	62.5
Preventive sexual behavior	Negative	40	33.3
	Positive	80	66.7

The association between reproductive health literacy and preventive sexual behavior is shown in Table 3. Among respondents with high reproductive health literacy, 78.7% showed positive preventive sexual behavior. In contrast, only 46.7% of respondents with low reproductive health literacy demonstrated positive preventive sexual behavior. The chi-square test showed a statistically significant association between reproductive health literacy and preventive sexual behavior ($\chi^2 = 11.56$; $p =$

0.001). Respondents with high reproductive health literacy were 4.21 times more likely to demonstrate positive preventive sexual behavior compared with those with low reproductive health literacy.

Table 3. Association between Reproductive Health Literacy and Preventive Sexual Behavior

Reproductive Health Literacy	Negative Behavior n (%)	Positive Behavior n (%)	Total n (%)	OR	95% CI	p-value
Low	24 (53.3)	21 (46.7)	45 (100.0)	4.21	1.88-9.43	0.001
High	16 (21.3)	59 (78.7)	75 (100.0)			

OR = odds ratio; CI = confidence interval.

Discussion

This study examined the association between reproductive health literacy and preventive sexual behavior among adolescents in a senior high school setting. The findings showed that most respondents had a high level of reproductive health literacy and demonstrated positive preventive sexual behavior. More importantly, adolescents with high reproductive health literacy were significantly more likely to report positive preventive sexual behavior than those with low reproductive health literacy [12]. After controlling for age, sex, grade level, exposure to reproductive health education, and parent-adolescent communication, reproductive health literacy remained significantly associated with preventive sexual behavior. These findings suggest that reproductive health literacy is an important factor in shaping adolescents' ability to make informed and responsible decisions related to sexual and reproductive health [13][14]. The finding that adolescents with higher reproductive health literacy were more likely to demonstrate preventive sexual behavior is consistent with the theoretical concept of health literacy. Reproductive health literacy is not limited to knowledge about reproductive organs or sexual risks; it also includes the ability to access, understand, appraise, and apply reproductive health information in daily decision-making [15]. Adolescents with higher literacy are more likely to recognize risky situations, evaluate the credibility of information, seek appropriate support, and choose behaviors that reduce reproductive health risks. This may explain why respondents with high reproductive health literacy in this study were more likely to report positive preventive behavior [16].

This result is in line with the study by Manwong et al., which found an association between sexual health literacy and preventive behaviors related to pregnancy and sexually transmitted diseases among middle-school students [17]. Similar to the present study, their findings indicate that literacy plays an important role in translating information into preventive action. Adolescents who can understand and use sexual and reproductive health information are more likely to adopt behaviors that protect them from unintended pregnancy, sexually transmitted

infections, and other reproductive health risks. Therefore, literacy-based approaches may be more effective than interventions that only focus on increasing knowledge [18][19].

The present study also supports previous evidence showing that adolescent reproductive health behavior is influenced by access to information and education [20]. In this study, previous exposure to reproductive health education was significantly associated with positive preventive sexual behavior in the multivariable analysis. This finding is consistent with international recommendations emphasizing the importance of comprehensive sexuality education for adolescents [21]. School-based reproductive health education can provide adolescents with accurate, age-appropriate, and scientifically sound information. When delivered effectively, such education may improve knowledge, strengthen attitudes, and encourage safer decision-making [22]. The findings are also relevant to the Indonesian school context. Previous reviews of school-based sexual and reproductive health education in Indonesia have reported that reproductive health education is often fragmented across subjects such as biology, physical education, religious education, civic education, and extracurricular activities [23]. This fragmented delivery may limit students' ability to develop comprehensive reproductive health literacy [24]. The present study suggests that strengthening reproductive health literacy among senior high school students may contribute to more positive preventive sexual behavior. Therefore, reproductive health education should not only provide biological information but also develop students' critical thinking, communication skills, risk appraisal, and ability to access youth-friendly health services [25].

In addition, the role of digital media should be considered. Many adolescents obtain reproductive health information from the internet and social media [26]. Although digital platforms can increase access to information, they may also expose adolescents to misinformation, incomplete information, or content that is not age-appropriate. Adolescents with higher reproductive health literacy may be better able to distinguish reliable sources from misleading information [27]. This is particularly important in the current digital environment, where adolescents often search for sensitive health information privately [28]. Thus, reproductive health literacy programs should include digital health literacy components, such as identifying credible sources, evaluating online health claims, and knowing when to seek professional advice [29]. Parent-adolescent communication was positively associated with preventive sexual behavior, although the association was not statistically significant in the adjusted model. This finding suggests that communication with parents or guardians may play a protective role, but cultural barriers, communication quality, and the sensitivity of reproductive health topics may influence its effect. In many contexts, including Indonesia, discussions about

sexuality and reproductive health are still considered taboo [30][12]. As a result, adolescents may be reluctant to ask questions, while parents may feel uncomfortable or lack sufficient knowledge to provide accurate explanations. Previous studies have shown that open parent-adolescent communication about sexual and reproductive health can support safer behavior among adolescents [31]. Therefore, future school-based programs should involve parents or guardians to improve communication skills and reduce stigma surrounding reproductive health discussions.

The non-significant association between sex and preventive sexual behavior in this study suggests that both male and female adolescents require equal access to reproductive health literacy programs. Reproductive health education is often perceived as more relevant to girls, particularly because of menstruation, pregnancy, and maternal health. However, boys also need adequate reproductive health literacy to understand consent, sexually transmitted infection prevention, responsible relationships, and shared responsibility in reproductive health [8]. Gender-sensitive reproductive health education should therefore address the needs of both male and female adolescents while challenging harmful gender norms that may increase vulnerability to risky behavior [32][21]. Age was also not significantly associated with preventive sexual behavior in the adjusted analysis. This finding may be due to the relatively narrow age range of the respondents, as most senior high school students were between 15 and 18 years old. Within this age group, differences in preventive behavior may be more strongly influenced by exposure to information, literacy, peer influence, family communication, and the school environment than by age alone. This result highlights the importance of providing reproductive health education throughout adolescence rather than assuming that older students automatically have a better understanding or safer behavior [33][25].

The main implication of this study is that reproductive health literacy should be integrated into adolescent health promotion programs in schools. Interventions should move beyond one-way information delivery and focus on developing practical literacy skills [26]. These include the ability to search for reliable information, understand reproductive health risks, evaluate misinformation, communicate with trusted adults or health professionals, and apply preventive strategies in real-life situations. Teachers, school health units, nurses, counselors, and local health workers can collaborate to deliver structured and adolescent-friendly reproductive health education [20]. This study also highlights the need for supportive school policies. A school environment that allows accurate, respectful, and non-judgmental reproductive health education may help reduce stigma and encourage adolescents to seek information and support [16]. Collaboration between schools, families, and health services is essential. Youth-friendly health services should also be made more visible and accessible so that students know where to

obtain confidential and reliable reproductive health support [14]. Several limitations should be acknowledged. First, the cross-sectional design limits the ability to establish causal relationships between reproductive health literacy and preventive sexual behavior. Although a significant association was found, it cannot be concluded that reproductive health literacy directly causes preventive sexual behavior. Second, data were collected using self-administered questionnaires, which may be subject to social desirability bias, especially because sexual and reproductive health is a sensitive topic among adolescents. Third, the study was conducted at a single senior high school with a sample of 120 respondents, which may limit the generalizability of the findings to adolescents in other schools or regions. Fourth, preventive sexual behavior was measured based on self-report, and actual behavior may differ from reported behavior.

Despite these limitations, this study provides important evidence that reproductive health literacy is associated with preventive sexual behavior among adolescents. The findings suggest that improving reproductive health literacy may be a strategic approach to reducing reproductive health risks among senior high school students. Future studies should consider using longitudinal or intervention designs to examine whether improvements in reproductive health literacy lead to changes in preventive sexual behavior over time. Further research involving larger and more diverse samples is also recommended to understand better the role of family, peers, digital media, the school environment, and youth-friendly health services in shaping adolescent reproductive health behavior.

CONCLUSION

This study demonstrates that reproductive health literacy is significantly associated with preventive sexual behavior among adolescents in a senior high school setting. Adolescents with higher reproductive health literacy were more likely to demonstrate positive preventive behaviors, including seeking reliable reproductive health information, avoiding risky sexual practices, communicating about reproductive health, and recognizing the importance of appropriate health services. These findings highlight that reproductive health literacy is not limited to knowledge acquisition but also involves the ability to access, understand, evaluate, and apply information to make responsible health decisions. Therefore, strengthening reproductive health literacy through comprehensive, culturally appropriate, and school-based reproductive health education is essential to support safer decision-making and reduce sexual and reproductive health risks among adolescents.

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