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Sexual and Reproductive Health Literacy among Junior High School Students: Evidence from Surakarta, Indonesia

Murni Ramli[1*], Wafiyah Wahyuningsih Wilma Noor Syabani[2], Febriani Sarwendah Asri Nugraheni[3]

1- Research Group Biology Education, Department of Biology Education Faculty of Teacher Training and Education, Universitas Sebelas Maret, Surakarta, Indonesia. **(Corresponding Author)** mramlim@staff.uns.ac.id
2- Department of Natural Science Education, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Surakarta, Indonesia.
3- Department of Natural Science Education, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Surakarta, Indonesia.

Background and Objectives: Cases of early marriage and sexual violence remain prevalent in Indonesia, highlighting the urgent need for adolescents to possess adequate sexual and reproductive health literacy (SRHL). Junior high school students should have too to prevent risky sexual behaviors, such as premarital or casual sex. However, limited research has examined Indonesian adolescents' perspectives and understanding of SRHL, and factors influencing the literacy levels. This study aimed to investigate the level of SRHL among junior high school students in Surakarta and to analyze the factors that influence it.

Material and Methods: An ex post facto survey was conducted in 2023 involving 447 students aged 13–15 years from eight schools representing the diversity of Indonesia's school system (public, private, Islamic, and Catholic). Schools were purposively selected to ensure proportional representation, and students were randomly chosen. Data were collected through an online questionnaire consisting: demographic information, a 51-item knowledge test, and a 47-item attitude scale. Instrument validity and reliability were confirmed through expert judgment and field testing. Eta correlation was applied for nominal variables (age, gender, and school type), while Pearson's correlation was used to analyze relationships between interval variables (knowledge and attitude). SRHL levels were categorized as inadequate, problematic, sufficient, or excellent.

Results: Of the total participants, 53.2% demonstrated a sufficient level of SRHL, 19.7% were excellent, 25.5% problematic, and 1.6% inadequate. Weak correlations were found between SRHL and both age ($\eta^2 = 0.201$) and school type ($\eta^2 = 0.349$), while gender showed no significant relationship ($\eta^2 = 0.099$). Knowledge and attitude showed strong positive correlations with SRHL (R = 0.524 and R = 1.000, respectively).

Conclusion: Most junior high school students in Surakarta demonstrated sufficient SRHL. Knowledge and attitude were found to be strongly and positively associated with sexual and reproductive health literacy levels.

Keywords: Junior High School Student, Knowledge and Attitude, Survey, School Type

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Introduction

Adolescents' understanding of sexual and reproductive health literacy (SRHL) plays a crucial role in navigating the moral and social challenges of modern society. Adequate SRHL helps prevent risky sexual behaviors, including premarital or casual sexual relations (1). A survey conducted by Nurfadhilah and Ariasih (2) revealed that 81.6% of Indonesian teenagers acknowledged the importance of learning about sexual and reproductive health.

In Indonesia, several sexuality-related issues have raised serious concern, particularly early marriage and sexual violence. Data from 2018 indicated that one in nine Indonesian women aged 20–24 years had been married before the age of 18, amounting to approximately 1.2 million girls—placing Indonesia as the tenth-highest country globally for the number of child marriages (3). Furthermore, the number of sexual violence cases increased from 10,328 in 2020 to 11,682 in 2021, with adolescents aged 13–17 being the most frequent victims (4). Reports from East Java showed 449 applications for marriage dispensation among school-age teenagers in Mojokerto (5) and 19 similar cases in Surabaya in early 2023 (6). In Surakarta Municipality, Central Java, 338 early marriages were recorded in 2021 (7). These figures highlight the urgent need to strengthen SRHL among young people.

Indonesia, a diverse and pluralistic country with a population of over 270 million (8), faces unique challenges in implementing SRHL education. The majority of its citizens are Muslim (87.2%), with Javanese as the dominant ethnic group (40.22%). However, cultural conservatism often restricts open discussions on sexual and reproductive health, making it a sensitive or even taboo topic among families and schools (9).

Sexual and reproductive health literacy is an integral part of health literacy, encompassing the ability to access, comprehend, and apply health-related information for informed decision-making (10, 11). SRHL contributes to the achievement of the Sustainable Development Goals (SDGs), particularly in health and gender equality (12). It not only supports physical well-being but also promotes emotional and social health by emphasizing respect for individual sexual rights.

Adequate SRHL enables adolescents to make informed decisions, avoid early pregnancy, and seek professional assistance when needed (13). Factors influencing SRHL include individual attitudes and family support (14–16). Families serve as primary educators, yet discussions about sexual health often remain limited due to taboos and misinformation (23, 24).

The education sector plays a pivotal role in promoting SRHL (16, 17). Indonesia's Ministry of Education and Ministry of Religious Affairs have introduced SRHL programs and guidelines for teachers (19), emphasizing curriculum integration, role models, and extracurricular initiatives. However, implementation varies across school types. Public, private, and religious schools—such as Islamic and Catholic institutions—often adopt distinct curricula that may influence students' exposure to and understanding of SRHL.

While schools and families are both expected to play vital roles, the extent to which these educational frameworks affect students' SRHL remains underexplored. Therefore, this study aims to investigate the level of sexual and reproductive health literacy among junior high school students in Surakarta Municipality, Indonesia, and to analyze the correlation between

SRHL and factors such as age, gender, and school type. Surakarta provides a relevant context due to its notable rates of underage marriage (23 cases in 2023) and child sexual crimes (59 cases, including 38 sexual offenses) (29, 30).

Despite national initiatives to strengthen sexual and reproductive health education in schools, there remains limited empirical evidence on adolescents' actual levels of sexual and reproductive health literacy (SRHL) and the factors influencing it in Indonesia. Understanding these factors is crucial for designing effective educational interventions tailored to the cultural and institutional diversity of the country.

Therefore, this study aimed to investigate the level of SRHL among junior high school students in Surakarta Municipality and to identify factors that may influence it. Specifically, the study sought to answer the following research questions:

(1) What is the overall level of SRHL among junior high school students?
(2) How do SRHL levels differ according to age, gender, and type of school?
(3) What is the relationship between students' knowledge and attitude toward sexual and reproductive health?

Materials and Methods

Research Design

This study employed an ex-post facto survey design with unmanipulated variables and a cross-sectional approach. The independent variables were age (13, 14, and 15 years), gender (male and female), and type of school (public junior high school, Islamic public junior high school, private junior high school, Islamic private junior high school, and Catholic private junior high school). The dependent variable was the level of sexual and reproductive health literacy (SRHL).

Participants

A total of 447 respondents were selected from approximately 30,465 junior high school students in Surakarta City, Indonesia. The participants were chosen using a simple random sampling technique from each school type to ensure proportional representation. The sample consisted of students from eight schools: two public schools ($n_1 = 81$, $n_2 = 29$), one Islamic public school ($n_3 = 71$), two private schools ($n_4 = 66$, $n_5 = 66$), one Islamic private school ($n_6 = 36$), and two Catholic private schools ($n_7 = 59$, $n_8 = 39$).

Surakarta is an urban city in Central Java Province with a population of 523,008, predominantly Javanese (49% male, 51% female). The majority (88%) of residents identify as Muslim, while the rest are Protestant, Catholic, Hindu, Buddhist, or other religions.

Instrument

The SRHL instrument was adapted from indicators developed by Ma et al. (11). It consisted of two parts:

1. Knowledge test – 51 multiple-choice questions assessing students' knowledge of sexual and reproductive health.
2. Attitude scale – 47 items (positive and negative statements) measured on a 4-point Likert scale. The 4-point scale was used to avoid central tendency bias, as respondents tend to choose neutral options (31, 32).

The instruments underwent expert validation by four experts — a biologist, pedagogist, psychologist, and researchers from the Center for Demography and Gender Studies, Sebelas Maret University. The experts reviewed the item quality and cultural sensitivity to ensure the ethical issue or questions would not harm respondents. Two field tests were conducted involving 60 students who were not part of the main survey. The result of validity and reliability test was figured out in **Table 1**.

Table 1. Validity and reliability of the instrument

Type of Validity	Aspect	No. of Items	Valid Items	Invalid Items	Reliability Coefficient
Expert Judgment	Knowledge	56	56	0	NA
	Attitude	68	68	0	NA
Field Test 1	Knowledge	56	48	8	0.89
	Attitude	68	38	30	0.70
Field Test 2	Knowledge	51	51	0	0.90
	Attitude	47	47	0	0.92

Procedure

Respondents that have been determined in each school were received an invitation to fill in the data. The participation was voluntary. Data collection was conducted online using Google Forms, with an average completion time of approximately one hour. Most respondents completed the questionnaire independently at home, while others did so at school under supervision by researchers or teachers. Each participant was allowed to submit only one response.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. The ordinal attitude scores were transformed into interval data using the successive interval method before being combined with knowledge scores. The final SRHL score for each participant was computed using the following formula, adapted from the Health Literacy European Index (33):

$$\text{SRHL Score} = \frac{(\text{Knowledge Score} + \text{Attitude Score})}{239} \times 50$$

The SRHL scores were categorized into four levels (25), as shown in **Table 2.**

Table 2. Categories for scoring sexual and reproductive health literacy

SRHL Level	Score Range
Inadequate	0-25
Problematic	26-33
Sufficient	34-42
Excellent	43-50

Descriptive statistics included the mean, median, mode, minimum and maximum scores, standard deviation, and percentage. Eta correlation tests were used to examine relationships

between nominal/ordinal independent variables (age, gender, and school type) and the interval dependent variable (SRHL level). Pearson correlation was used to determine the relationship between two interval variables (knowledge and attitude).

Results

The demographic characteristics of participants are presented in **Table 3**.

Overall Level of Sexual and Reproductive Health Literacy

The distribution of students' SRHL levels is summarized in **Table 4**. More than half of the respondents (53.2%) demonstrated a sufficient level of SRHL, while 19.7% achieved an excellent level. Meanwhile, 25.5% were categorized as problematic, and 1.6% as inadequate.

The mean SRHL score was 36.74 (SD = 5.39), with scores ranging from 23 to 48, a median of 37, and a mode of 38.

Table 3. Demographic of participants

Category	Subcategory	n	%
Gender	Boy	207	46.3
	Girl	240	53.7
Age Level	Aged 13	208	46.5
	Aged 14	136	30.4
	Aged 15	103	23.0
School type	Public state JHS	110	24.6
	Islamic state JHS	71	15.9
	Public-private JHS	66	14.8
	Islamic private JHS	102	22.8
	Catholic private JHS	98	21.9

Total participants = 447

Table 4. General sexual and reproductive health literacy profile

Category	N (%)
Inadequate	7 (1.6)
Problematic	114 (25.5)
Sufficient	238 (53.2)
Excellent	88 (19.7)

Total participants = 447

SRHL by Age Group

Table 5 shows that the majority of students across all age groups were at the sufficient level of SRHL. Students aged 14 years achieved the highest mean score (M = 38.22±5.38), followed by those aged 15 (M = 37.08±5.93) and 13 (M = 35.61±5.50). This trend suggests a gradual improvement in SRHL with increasing age, although the correlation analysis (η^2 = 0.201) indicated only a weak association between age and SRHL.

Table 5. Sexual and reproductive health literacy profile based on age level

Category	N (%)		
	Age 13	Age 14	Age 15
Inadequate	2 (0.96)	2 (1.47)	3 (2.91)
Problematic	69 (33.17)	23 (16.91)	22 (21.36)

Sufficient	111 (53.37)	74 (54.41)	53 (51.46)
Excellent	26 (12.50)	37 (27.21)	25 (24.27)
Mean ± SD	35.61±5.50	38.22±5.38	37.08±5.93
Minimum Score	23	23	24
Maximum Score	48	48	48
Total N	208	136	103
Total	208	136	103

Total participants = 447

SRHL by Gender

As shown in **Table 6**, both male and female students were mostly at the sufficient level of SRHL (50.2% and 55.4%, respectively). The mean SRHL score for females (M = 37.80±5.53) was slightly higher than for males (M = 35.69±5.58). However, the correlation coefficient (η^2 = 0.099) indicated that the relationship between gender and SRHL was weak and statistically insignificant.

Table 6. Sexual and reproductive health literacy profile based on gender

Category	Frequency (%)	
	Male	Female
Inadequate	1 (0.48)	4 (1.67)
Problematic	64 (30.92)	39 (16.25)
Sufficient	104 (50.24)	133 (55.42)
Excellent	38 (18.36)	64 (26.67)
Mean ± SD	35.69±5.58	37.80±5.53
Total	207 (100)	240 (100)

Total participants = 447

SRHL by School Type

Table 7 summarizes SRHL levels based on school type. Catholic private JHS students showed the highest SRHL levels, with 88.8% categorized as sufficient or excellent. Conversely, Islamic private JHS students recorded the lowest SRHL performance, with only 53.9% achieving sufficient or excellent levels. The correlation coefficient between school type and SRHL (η^2 = 0.349) indicated a moderate relationship.

As presented in **Table 7**, the mean SRHL scores varied across school types. Islamic state JHS students scored the highest (M = 39.68±4.81), followed by Catholic private JHS (M = 38.93±5.26). The lowest mean score was found among Islamic private JHS students (M = 34.51±5.97).

Table 7. Sexual and reproductive health literacy profile based on school type

Category	N (%)				
	A	B	C	D	E
Inadequate	3 (2.7)	0 (0.0)	1 (1.5)	3 (2.9)	0 (0.0)
Problematic	31 (28.2)	8 (11.3)	20 (30.3)	44 (43.1)	11 (11.2)
Sufficient	63 (57.2)	38 (53.5)	35 (53.0)	41 (40.2)	61 (62.2)
Excellent	13 (11.8)	25 (35.2)	10 (15.2)	14 (13.7)	26 (26.5)

Mean ± SD	35.61±5.15	39.68±4.81	35.67±5.19	34.51±5.97	38.93±5.26
Minimum Score	24	25	23	23	25
Maximum Score	46	48	46	48	48
Total	110 (100)	71 (100)	66 (100)	102 (100)	98 (100)

Total participants = 447

Note: A: public state JHS, B: Islamic state JHS, C: public private JHS, D: Islamic private JHS, E: Catholic private JHS

Assumption Tests

Before conducting the correlation analysis, assumption tests were carried out to ensure that the dataset met the statistical prerequisites. Two main assumption tests were applied: the normality test and the homogeneity test.

First, the normality test was conducted using the Kolmogorov–Smirnov method with a 5% significance level ($\alpha = 0.05$). The results showed a significance value of 0.048, which was slightly below the conventional threshold of 0.05. However, given the relatively large sample size ($n = 447$), minor deviations from normality were considered acceptable according to the Central Limit Theorem, which posits that the distribution of sample means tends to approximate normality as the sample size increases. Therefore, the data were deemed sufficiently normal for parametric statistical analysis.

Second, the homogeneity test was performed using Levene's Test to assess the equality of variances across groups. The result indicated a significance value greater than 0.05, suggesting that the data were homogeneous, meaning the variance among the different groups (age, gender, and school type) was statistically equal. This confirmed that there were no significant differences in data dispersion across categories.

Overall, the results of the assumption tests demonstrated that the dataset met the requirements for conducting subsequent correlation analyses. The normality and homogeneity assumptions were adequately satisfied, thereby ensuring the validity and reliability of the statistical interpretations derived from the data.

Correlation Analysis

Following the assumption tests, correlation analyses were conducted to examine the relationships among key variables influencing students' sexual and reproductive health literacy (SRHL). The analysis focused on determining whether age, gender, and type of school were associated with variations in SRHL levels, and whether knowledge and attitude were correlated with each other within the SRHL construct.

The Eta correlation test was used to analyze the relationship between the categorical independent variables (age, gender, and school type) and the continuous dependent variable (SRHL level). The findings revealed that age demonstrated a weak correlation with SRHL, with a coefficient value of $\eta^2 = 0.201$. This suggests that age differences among the respondents (13–15 years old) did not substantially influence their level of sexual and reproductive health literacy.

Similarly, gender showed a very weak association with SRHL ($\eta^2 = 0.099$), indicating that boys and girls had relatively comparable levels of understanding and awareness of sexual and reproductive health.

In contrast, the type of school exhibited a more noticeable relationship with SRHL ($\eta^2 = 0.349$), signifying a moderate association. This finding implies that variations in the school environment—such as curriculum differences, institutional culture, and religious or pedagogical orientations—may influence students' SRHL levels. In particular, students from faith-based schools (e.g., Catholic or Islamic schools) demonstrated differences in literacy levels that reflected the contextual emphasis placed on sexuality and health education.

The Pearson product-moment correlation was applied to explore the relationship between knowledge and attitude components within SRHL. The analysis yielded a correlation coefficient (r) of 0.524, indicating a strong and positive relationship between the two variables. This means that students with higher knowledge of sexual and reproductive health tended to demonstrate more positive attitudes toward related issues, including responsible behavior, respect for bodily autonomy, and awareness of reproductive rights. The result suggests that enhancing students' cognitive understanding of SRH is likely to foster more constructive and informed attitudes, contributing to healthier decision-making among adolescents.

Overall, the correlation analyses indicate that while demographic variables such as age and gender exert minimal influence on SRHL, contextual factors like the type of school and internal components such as knowledge and attitude play a more significant role in shaping adolescents' literacy on sexual and reproductive health.

Discussion

This discussion aims to interpret the survey findings in relation to the study objective, which was to assess the level and determinants of sexual and reproductive health literacy (SRHL) among junior high school students in Surakarta, Indonesia. By analyzing the levels of SRHL and examining the correlations between demographic and educational factors, this study seeks to provide a comprehensive understanding of the factors influencing adolescents' literacy in this critical area. Interpreting the results in light of previous research and theoretical perspectives allows for a deeper exploration of the implications for educational and public health interventions.

A total of 238 out of 447 respondents were at the sufficient literacy level, equivalent to 53.3% of the research sample, with a mean value of 36.74 and a standard deviation of 5.67. Many factors may have influenced adolescents' achievement of a sufficient SRHL in Surakarta, including educational factors and the level of internet use within their daily lives. Adolescents can acquire sexual and reproductive health education from both the home and school environments. At home, parents can provide sex education according to age development, teach religious values and applicable norms, and increase knowledge about reproductive health in the digital world (34). Within the education system, sexual and reproductive health tends to focus solely on knowledge of biological aspects, especially within the context of studying science subjects (35). Nevertheless, teachers can set an example by displaying an open, non-judgmental, responsive, and critical attitude and by knowing the limits of privacy in discussions about sexuality with students (36).

Several external factors may have influenced the results of the SRHL survey. First, demographic factors include school location, home location, parents' education and employment, and access to the Internet and health services. Different school and home locations may produce different test results. Adolescents who attend school and live in urban areas have been found to obtain significantly higher scores (33). Furthermore, parents' education and employment influence the SRHL levels of adolescents, as parents play a crucial role in their children's educational attainment. The more parents are involved in their children's development, the better their academic status will be (37). Meanwhile, internet coverage in the city of Surakarta is evenly distributed across both cellular and fiber networks. Access to health services is adequate, with 17 community health centers, two hospitals under the authority of the Surakarta City Government, and many private health service centers (38).

The following external factors are relevant to the level of sex education obtained from the community or school. School- and community-based sex education can be an appropriate and economical way to prevent sexually aberrant behavior among adolescents while simultaneously increasing their knowledge of sexual and reproductive health (39). Providing education to adolescents through socialization and intervention can increase their knowledge, skills, and attitudes toward sexual and reproductive health (40–43).

Based on the correlation test results, age level is related to SRHL; however, the relationship between the two variables is weak. The results of this correlation test support the mapping data showing that 14-year-olds have better SRHL than 13-year-olds while also having better literacy than 15-year-olds. Adolescents aged 14, or equivalent to grade VIII, were found to have the best SRHL scores. This is attributable to factors related to the learning material received. At age 13, students receive material on the human organ system, which includes the human reproductive system. The logical memory of adolescents aged 14 can work to control and remember new things and events that have happened in the past and consciously coordinate all these processes for specific purposes (44).

While no relationship was identified between gender and the level of SRHL, the survey results showed that female adolescents had superior SRHL scores. Adolescent girls may achieve higher scores because they tend to be more open than teenage boys, including in terms of sexual health and reproduction (45). In addition, prior studies have shown that female adolescents can better express themselves, have more positive perceptions, and use technology more confidently (46–48).

Statistical tests showed a weak relationship between school type and SRHL level. Thus, while the type of school was not found to affect the quality of SRHL understanding, it remains a supporting factor. Schools can provide support through outreach activities to increase students' insights. These can be carried out in collaboration with health service centers, local city health offices, and experts related to SRHL, such as adolescent psychologists, sexual and reproductive health counselors, and others (41,49).

The statistical test results showed a strong relationship between knowledge and attitudes in SRHL. This finding aligns with the results of previous studies, which examined the relationship between knowledge and adolescents' attitudes toward the concept of premarital sex. Their results showed a correlation between knowledge and attitudes in premarital sex (50–52). Adolescents' attitudes were found to influence SRHL (14), and sex education was found to be

closely related to positive sexual behavior in students (53). Knowledge and good attitudes were also found to simultaneously reduce risky sexual behavior (54).

The Elaboration Likelihood Model (ELM) can explain the interrelationship between knowledge and attitudes. According to this theory, knowledge is essential in shaping individual attitudes. ELM theory explains that two routes can be used to process persuasive messages: the central and the peripheral routes. Individuals with broad knowledge will use the central route to analyze a message in depth, consider the relevance of the information, and evaluate it critically. Knowledge plays a role in increasing motivation because there is a perception that the issue is important and relevant. The length of this process impacts the formation of attitudes based on logical and rational considerations in line with the knowledge possessed. In contrast, individuals with limited knowledge tend to use the peripheral route in processing persuasive messages. In-depth analysis is more challenging due to limited knowledge. Therefore, this type of individual is more influenced by peripheral factors (such as the messenger's physical appearance and emotional connection), and attitudes are more susceptible to change. ELM explains that individuals' attitudes can be permanent or temporary based on the message processing flow. A permanent attitude is developed when a message is processed via a central route, meaning that motivation, ability, and opportunity are involved in elaborating on the contents of the message received. Conversely, if there is no motivation, ability, or opportunity, message processing can only occur via the peripheral route, and temporary attitudes are formed (55,56).

Overall, these findings highlight the multidimensional nature of SRHL and emphasize the need for holistic interventions addressing both cognitive and affective domains. Schools should integrate SRHL education across disciplines, involving teachers, health professionals, and parents to ensure consistent messaging. Future research could explore intervention models that combine digital literacy and parental engagement to enhance adolescents' SRHL. Additionally, longitudinal or mixed-methods designs may better capture the developmental and contextual factors influencing SRHL across different age groups and educational settings.

Conclusion

The majority of junior high school students in Surakarta City demonstrated a sufficient level of sexual and reproductive health literacy (SRHL) (53.2%), followed by problematic (25.5%), excellent (19.7%), and inadequate (1.6%) levels. Weak correlations were found between SRHL and both age and gender, whereas a moderate association emerged with school type. A strong positive correlation between knowledge and attitudes further indicates that improving adolescents' understanding can foster more responsible and positive perspectives toward sexual and reproductive health.

These findings suggest that while the current SRHL education framework in Indonesia provides a basic foundation, it remains insufficient to promote comprehensive literacy among adolescents. Efforts should focus on integrating SRHL topics into formal curricula through participatory and culturally sensitive learning strategies, supported by teacher capacity building and cross-sectoral partnerships between schools and health agencies. Parents and community leaders also play a crucial role in creating open communication channels that reinforce accurate information and healthy values.

Future research should examine additional determinants such as socio-economic background, digital media influence, and parental involvement using a mixed-method or longitudinal approach. Such studies would provide a more nuanced understanding of how SRHL develops and identify the most effective interventions for promoting adolescent well-being in diverse sociocultural settings.

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