



REPRODUCTIVE HEALTH LITERACY AMONG ADOLESCENTS IN PEKANBARU: A CROSS- SECTIONAL STUDY

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Abstract

Reproductive health literacy is a foundational element in promoting sustainable public health, particularly among adolescents. Despite its importance, global and national studies consistently report low literacy levels in this domain. This cross-sectional study aimed to assess the reproductive health literacy of junior high school students in Pekanbaru, Indonesia, with a specific focus on gender-based disparities. A total of 323 students were purposively selected and surveyed using a highly reliable instrument adapted from the Health Literacy Measure for Adolescents (HELMA), which evaluates five key domains: accessing, reading, understanding, appraising, and applying health information. Findings revealed that 91.02% of respondents fell into the “inadequate” literacy category, with no participants achieving an “excellent” level. Gender analysis showed that 95.04% of male and 87.91% of female students were classified as having inadequate literacy, while only 3.72% reached a “sufficient” level. Although female students exhibited slightly higher proportions in the “problematic” and “sufficient” categories, the overall literacy remained critically low across both genders. Domain-specific analysis indicated stronger conceptual understanding among adolescents but significant weaknesses in functional and critical literacy skills. This study contributes novel insights by documenting lower literacy levels than previously reported in national and international contexts, and by offering a detailed breakdown across literacy domains. The results underscore the urgency of implementing targeted, domain-based, and gender-sensitive educational interventions. Furthermore, the findings advocate for a locally grounded, collaborative approach involving schools, healthcare providers, families, and digital media to cultivate a supportive information ecosystem that empowers adolescents in making informed reproductive health decisions.

Keywords: *adolescents; cross-sectional study; health education; reproductive health literacy*

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INTRODUCTION

Adolescent reproductive health literacy constitutes a critical component in the advancement of sustainable public health development. This literacy encompasses adolescents' ability to access, comprehend, and effectively utilize information related to reproductive health in their daily decision-making processes. Nevertheless, in recent years, numerous studies have indicated that the level of reproductive health literacy among adolescents remains considerably low on a global scale, including in Indonesia.

Cross-national studies conducted in Ethiopia, Lao PDR, Myanmar, Ghana, and China consistently report that the majority of adolescents possess limited knowledge and skills concerning reproductive health. In Ethiopia, approximately 70–82% of adolescents were found to have low literacy levels regarding sexual and reproductive health. In Indonesia, only 13–20% of adolescents exhibit adequate literacy, while more than half are categorized as having insufficient knowledge (Batu et al., 2024; Debella et al., 2024; Kelecha et al., 2024). In Lao PDR, over 90% of early adolescents are classified as having problematic literacy, with female scores significantly lower than those of males (Lee et al., 2022). Myanmar reports that only 43% of adolescents demonstrate a sound understanding of pregnancy health literacy (Lat et al., 2022). Studies in Ghana and China likewise highlight persistent informational gaps and poor knowledge (Nkrumah et al., 2024; Xuemei et al., 2021). Similar trends are seen in Indonesia, where only 13–20% of adolescents demonstrate adequate literacy, while over half have insufficient knowledge (Kistiana et al., 2023; Kustin, 2023; Wardiati et al., 2023).

The low level of reproductive health literacy among adolescents is influenced by various determinant factors, including socioeconomic conditions (Kistiana et al., 2023), gender disparities (Lee et al., 2022; Xuemei et al., 2021), limited access to credible sources of information (Debella et al., 2024; Kistiana et al., 2023; Kustin, 2023), and sociocultural norms that restrict open discussions on reproductive issues (Wardiati et al., 2023). Adolescents from low-income families, rural areas, and public schools tend to exhibit lower literacy levels (Kelecha et al., 2024; Kistiana et al., 2023; Lat et al., 2022). Female adolescents also frequently demonstrate lower literacy levels compared to their male counterparts (Lee et al., 2022). Access to healthcare professionals, books, the internet, and school-based education is positively correlated with higher literacy; however, many adolescents lack reliable sources of information (Kistiana et al., 2023; Nkrumah et al., 2024). On the other hand, stigma and the absence of open dialogue hinder information access, particularly in conservative or rural settings (Wardiati et al.,

2023). Amid these challenges, various interventions have been developed, such as school-based education (Diarsvitri & Utomo, 2022) and peer support programs, which show potential in enhancing literacy levels (Sitiyaroh et al., 2024). Digital and mass media are increasingly becoming vital channels for reaching adolescents, although access disparities persist.

Despite ongoing efforts to enhance adolescent reproductive health literacy, recent data indicate that literacy levels remain inadequate. The local context plays a crucial role in understanding the dynamics of reproductive health literacy, as knowledge and its influencing factors vary significantly across regions, urban-rural divides, and cultural settings. Consequently, findings from one city cannot be generalized to other areas. Pekanbaru, as an urban center in Indonesia, may exhibit a distinct literacy pattern that has yet to be comprehensively mapped. Cross-sectional research among adolescents in Pekanbaru is therefore highly relevant for generating accurate and context-specific data. Such data can serve as a foundation for policymakers and educators in formulating targeted interventions. In the absence of current, locally grounded data, reproductive health education programs risk failing to meet specific needs or overlooking critical gaps. Given the prevailing low literacy levels, gender disparities, and regional variations, cross-sectional research among junior high school adolescents in Pekanbaru is imperative. Emphasizing gender-based comparisons will provide valuable insights for developing reproductive health education that is more effective, inclusive, and capable of delivering long-term impact.

METHODS

This study was conducted at a junior high school located within the watershed area (Daerah Aliran Sungai/DAS) of Pekanbaru City, Riau Province. The research was carried out from August to September 2025. It employed a descriptive-analytic approach with a cross-sectional design. The study population consisted of 330 students enrolled in grades VII, VIII, and IX. A total sampling technique was applied to recruit participants. Exclusion criteria included students who declined to participate and those absent during the data collection period.

Data collection was conducted through a survey utilizing a reproductive health literacy instrument adapted from the Health Literacy Measure for Adolescents (HELMA). This instrument (Rahmadhani, 2023) demonstrated a Cronbach's Alpha value of 0.9 (Pearson correlation), indicating a very high level of reliability. It comprises 22 items, each rated on a scale from 0 to 4, where 0 represents –never, and scores from 1 to 4 reflect a frequency range from –rarely to –always. The assessment results were evaluated using a score index divided into four

categories: inadequate (0–44), problematic (>45–58), sufficient (>59–73), and excellent (>74–88). These scores reflect the respondents' ability to access, comprehend, appraise, and apply information related to sexual and reproductive health.

To uphold ethical research principles, this study underwent ethical review and approval by the Research Ethics Committee of the Faculty of Nursing, Universitas Riau, under approval number 2929/UN19.5.1.8/KEPk.FKp/2025. As the study involved participants under the age of 18, both parental consent and child assent forms were utilized. Prior to completing the questionnaire, the researcher provided a clear explanation to respondents, encouraging honest and confident responses while maintaining physical distance between participants to minimize response bias. The researcher also ensured the confidentiality of all respondent data. The collected data were analyzed using SPSS software version 24.0. Descriptive analysis was employed to illustrate the characteristics of respondents and the levels of reproductive health literacy based on mean scores, standard deviations, and frequency distributions across each literacy category by gender. This approach was utilized to provide a comparative overview in a descriptive manner

RESULT AND DISCUSSION

This study involved a total of 323 respondents, with several prospective participants excluded due to unwillingness to participate, absence during data collection, or school discontinuation. The profile of respondents is presented in table 1.

Based on the frequency distribution of 323 respondents, the demographic characteristics reveal a nearly balanced composition between early adolescents aged 11–13 years (50.4%) and middle adolescents aged 14–17 years (49.6%). The majority of respondents were female (56.3%) and predominantly of Minang ethnicity (52.6%). The highest level of parental formal education was senior high school (SMA), with over 50% of both fathers and mothers attaining this level. Most respondents reported parental income below the regional minimum wage (UMK) (75.9%). Access to technology was relatively high, with 81.1% of respondents having internet access. Regarding public services, the majority (67.8%) perceived access to healthcare services as –Moderately Easy. In terms of artificial intelligence (AI) usage, Meta AI emerged as the most frequently used platform (54.2%), followed by ChatGPT (21.1%), although 18% of respondents had never used AI technology.

The analysis of Table 2, which presents the frequency distribution of reproductive health literacy among adolescents (n = 323), indicates a significant concern regarding literacy levels. A substantial proportion of respondents, totaling 294

individuals (91.02%), were classified as having Inadequate literacy. In contrast, only a small minority were categorized as Problematic (5.26%) and Sufficient (3.72%), with no respondents achieving the Excellent literacy level (0%). In terms of demographic composition, female

Table 2. Frequency Distribution Based on Reproductive Health Literacy Among Adolescents (n=323)

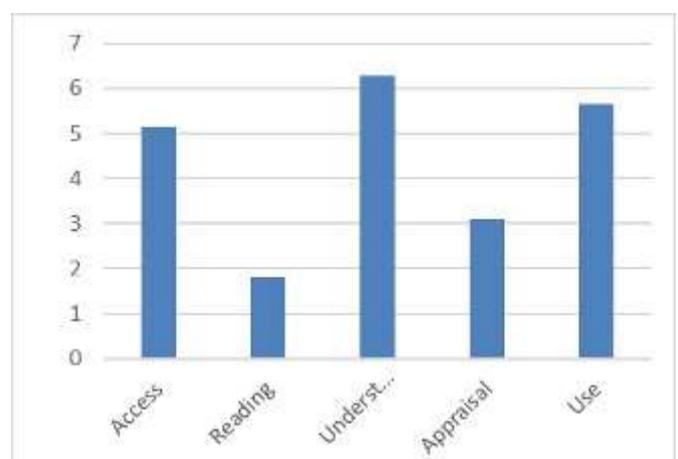
Reproductive Health Literacy Level	Frequency	Percentage (%)	Gender	
			Male	Female
Inadequate	294	91,02	134	160
Problematic	17	5,26	4	13
Sufficient	12	3,72	3	9
Excellent	0	0	0	0
Total	323	100	141	182

respondents constituted the majority (182 individuals) compared to male respondents (141 individuals) within the total sample.

Descriptive analysis showed that there was variation in the level of adolescent reproductive health literacy in the five domains measured. The domains with the highest average score were Understanding (Mean = 6.27 ± 5.40), followed by Use (Mean = 5.65 ± 6.11), Access (Mean = 5.15 ± 4.69), Appraisal (Mean = 3.10 ± 3.13), and Reading (Mean = 1.81 ± 1.95).

The findings of this study indicate that adolescent reproductive health literacy is at a critically low level, with the majority of respondents (91.02%) classified in the Inadequate category. This condition reflects limited adolescent capacity to access, comprehend, appraise, and utilize information related to reproductive health. Low reproductive health literacy during adolescence may lead to suboptimal decision-making regarding health behaviors, utilization of reproductive health services, and prevention of risks such as teenage pregnancy and sexually

Figure 1. Average reproductive health literacy score by Domain (ability to access, read, understand, appraise and use)



transmitted infections (Niltakan, 2024).

When examined by gender, both male and female adolescents exhibited a similar trend, with the majority falling into the Inadequate category. Of the 141 male respondents, 134 individuals (95.0%) were classified as having inadequate reproductive health literacy. Among the 182 female respondents, 160 individuals (87.9%) were similarly categorized. Although proportionally more females were represented in the Problematic and Sufficient categories, overall reproductive health literacy remains low across both genders.

Descriptive analysis of the five domains of reproductive health literacy reveals variation in adolescents' abilities to access, understand, appraise, read, and apply health information. The highest mean score was observed in the Understanding domain (Mean = 1.26), followed by Appraisal (Mean = 1.05), Access (Mean = 1.03), Reading (Mean = 0.91), and Use (Mean = 0.82). These findings suggest that adolescents are relatively stronger in comprehending information compared to other functional competencies. Although the Understanding and Use domains recorded higher mean scores, the elevated standard deviation in the Use domain indicates disparities among individuals in applying health information. Conversely, the Reading domain showed the lowest mean and standard deviation, reflecting limited functional literacy in interpreting symbols and health promotion texts. The Appraisal domain fell within a moderate range, indicating adolescents' limited ability to evaluate the credibility of health information.

These findings are consistent with a previous study by Ramadhaniati conducted in Bengkulu City in 2021 (Ramadhaniati et al., 2023) which revealed that adolescents more easily comprehend information delivered verbally by teachers, healthcare professionals, or parents compared to written texts. This phenomenon can be explained through the health literacy model (Sørensen et al., 2012), which emphasizes four core processes: access, understanding, appraisal, and application of information, with understanding being the domain that tends to develop more rapidly during adolescence. The low score observed in the Reading domain also highlights a gap in digital and media health literacy, exacerbated by the use of technical language and medical symbols that are difficult to interpret (Amanu et al., 2023; Whitehead et al., 2023). A lack of familiarity with complex scientific texts poses a major barrier, despite readability being a critical prerequisite for enhancing comprehension (Estrela et al., 2023; Fitzpatrick, 2023).

The substantial variation observed in the Use domain reflects disparities in access to information sources, personal experiences, and cultural norms that restrict open communication about reproductive health issues (Batu et al., 2024; Kelecha et al., 2024). To address these barriers,

educational materials must be adapted to match the target audience's literacy level, utilizing infographics and visual texts that have been proven effective in enhancing readability and information retention (Kong et al., 2025; Traboco et al., 2022).

The Understanding domain plays a critical role in shaping healthy behaviors, as limited comprehension of reproductive concepts—such as pregnancy, contraception, and sexually transmitted infections—can increase the likelihood of risky behaviors. Poor conceptual understanding is directly correlated with low utilization of health services, which, in the Indonesian context, may be attributed to limited discussion of reproductive topics in schools and cultural norms that regard sexual issues as taboo (Kelecha et al., 2024). Meanwhile, the low performance in the Appraisal domain indicates that adolescents are not yet capable of critically evaluating the credibility of information, particularly in the digital era saturated with content from social media. Stormacq et al. (2024) emphasize the importance of strengthening critical health literacy, defined as the ability to assess scientific evidence and distinguish valid information from misinformation, thereby opening opportunities for digital literacy-based educational interventions.

The Use domain reflects the ability to translate information into real-life behaviors, and the low score in this domain indicates adolescents' limited capacity to convert knowledge into action—such as utilizing reproductive health services or adopting preventive behaviors. Individuals with higher health literacy are twice as likely to access reproductive health services, underscoring the need for literacy enhancement to be accompanied by behavioral interventions and the provision of accessible services (Kelecha et al., 2024). From a demographic perspective, the predominance of female respondents (56%) does not necessarily correlate with higher literacy levels compared to males, suggesting that gender alone is not a determining factor. This variable interacts with other factors such as educational attainment, exposure to information, and sociocultural roles.

The study by Htun et al. (2025) highlights that gender differences in health literacy are often shaped by social expectations and distinct learning experiences. Therefore, health education policies must consider equitable access and adopt gender-sensitive approaches. Overall, these findings affirm that improving reproductive health literacy cannot be achieved solely through information transfer; rather, it requires a multidomain approach encompassing enhanced access, readability, conceptual understanding, critical appraisal, and behavioral application. These findings imply the need to integrate literacy-based reproductive health education into secondary school curricula, alongside strengthening the capacity of teachers and healthcare professionals as facilitators of health literacy. Additionally, the

development of interactive educational media tailored to adolescents' literacy levels may serve as an effective strategy to improve comprehension and application of reproductive health information.

CONCLUSION

The majority of adolescents demonstrated inadequate levels of reproductive health literacy, with only a small proportion reaching the —Sufficient category and none attaining an —Excellent level. These findings underscore the urgent need for comprehensive literacy improvement strategies, including enhanced access to information, development of easily understandable educational materials, and strengthened critical skills in evaluating and applying health information. This study offers novelty by identifying literacy levels that are lower than those reported in national and international studies, along with a domain-specific analysis of literacy competencies. Efforts to improve literacy should adopt a domain-based and gender-sensitive approach, supported by cross-sector collaboration among schools, healthcare professionals, families, and digital media to build an empowering information ecosystem for adolescents.

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Table 1.
Frequency Distribution of Respondent Characteristics

No	Characteristic	Frequency (n)	Percentage (%)
1	Age		
	- Early Adolescents (11-13 years)	163	50.4
	- Middle Adolescents (14-17 years)	160	49.6
2	gender		
	- Male	141	43.7
	- Female	182	56.3
3	Ethnicity		
	- Malay	63	19.5
	- Minang	170	52.6
	- Batak	46	14.2
	- Nias	19	5.9
	- Javanese	25	7.8
4	Father's Education		
	- Primary School	34	10.5
	- Junior High School	109	33.7
	- Senior High School	164	50.8
	- Higher Education	16	5.0
5	Mother's Education		
	- Primary School	41	12.7
	- Junior High School	87	26.9
	- Senior High School	177	54.8
	- Higher Education	18	5.6
6.	Parental Income		
	- Below Minimum Wage (UMK)	245	75.9
	- Above Minimum Wage (UMK)	78	24.1
7	Internet Access		
	- Yes	262	81.1
	- No	61	18.9
8	Access to Health Services		
	- Very Easy	51	15.8
	- Moderately Easy	218	67.8
	- Very Difficult	25	7.7
	- Moderately Difficult	29	9.0
9	Use of AI		
	- Never	58	118
	- Meta AI	175	54.2
	- Chat GPT	68	21.1
	- Gemini	7	2.2
	- Cici	15	4.5
	Jumlah	323	100