Digital Health Literacy and Health Information Seeking Behavior among Adolescents in Indonesia

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ABSTRACT

***Background**: The widespread use of the internet among adolescents has transformed how they access health information. However, the abundance of unverified online content poses risks for individuals who lack the skills to assess its credibility. Digital health literacy is therefore essential for enabling adolescents to seek, evaluate, and use health information responsibly. **Objectives**: This study examined the relationship between digital health literacy and health information-seeking behavior among Indonesian adolescents, providing empirical evidence to inform digital health promotion strategies. **Methods**: A cross-sectional analytic study was conducted with 524 adolescents aged 12–19 years from five provinces in Indonesia. Data were collected using an online questionnaire comprising the eHealth Literacy Scale (eHEALS) and a Health Information-Seeking Behavior (HISB) instrument developed by the researchers. Descriptive statistics were used to profile respondents, and Spearman's rank correlation was applied to assess the relationship between variables. **Results**: Overall, 38.2% of adolescents demonstrated high, 46.7% moderate, and 15.1% low digital health literacy. Adolescents with higher literacy levels exhibited more active and critical health information-seeking behavior, including more frequent use of credible sources, information verification, and appropriate application of information in decision-making. A significant positive correlation was found between digital health literacy and health information-seeking behavior ($\rho = 0.307$; $p = 0.007$), indicating that digital health literacy substantially influences adolescents' engagement with online health information. **Conclusion**: Digital health literacy plays an important role in shaping adolescents' health information-seeking behavior. Strengthening digital health literacy should be prioritized in health promotion initiatives targeting young populations in the digital era.*

***Keywords**: Digital Health Literacy, Health Information Seeking Behavior, Adolescents, Health Promotion, Indonesia*

INTRODUCTION

The development of digital technology has transformed the health information landscape in society, particularly among adolescents. This age group is highly active online, frequently using the internet and social media to seek health information (Xiaohui Wang, Jingyuan Shi, 2021; Xiaoyun Jia, Yan Pang, 2021; Freeman, Caldwell and Scott, 2022). However, the abundance of online health information is not always accurate or credible. Exposure to incorrect or misleading information can influence adolescents' health-related decision-making and negatively affect their health behaviors (Freeman, Caldwell and Scott, 2020, 2022; Paakkari and Okan, 2020).

The increasing penetration of the internet and social media among adolescents has has significantly influenced their health information-seeking behavior. A survey by the Indonesian Internet Service Providers Association (APJII, 2023) reported that internet penetration reached 80.66%, or approximately 229 million users. Notably, adolescents aged 13–18 exhibited the highest penetration rate (Databoks, 2024). This positions adolescents as the population most frequently exposed to

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online health information—both credible content and misinformation. However, not all online information is reliable. Adolescents with limited digital health literacy are particularly vulnerable to misinformation, which may adversely influence their health behaviors.

Digital health literacy—defined as an individual's ability to search for, understand, evaluate, and appropriately use health information from digital sources (Norman and Skinner, 2006)—has been widely recognized as a key factor in shaping critical and responsible health information-seeking behavior (Paakkari and Okan, 2020; Xiaohui Wang, Jingyuan Shi, 2021). However, research on digital health literacy among adolescents in Indonesia remains limited, despite the fact that this group, as digital natives, is particularly vulnerable to misinformation and infodemics.

The concept of digital health literacy is essential to understand, referring to an individual's ability to search for, comprehend, evaluate, and appropriately use health information from digital sources (Norman and Skinner, 2006). Previous studies have shown that higher levels of digital health literacy are associated with more critical and selective health information-seeking behavior (Kevin Dadaczynski, Orkan Okan, Melanie Messer, Angela Y M Leung, Rafaela Rosário, Emily Darlington, 2021; Diyi Liu, Shuhang Yang, Calvin Yixiang Cheng, Lin Cai, 2024). Digital health literacy enables adolescents to identify, interpret, and utilize health information effectively (Norman and Skinner, 2006; Hee Yun Lee, Seok Won Jin, Carrie Henning-Smith, Jongwook Lee, 2021). Without these skills, adolescents are at risk of becoming overwhelmed by the infodemic, potentially leading to misguided health decisions and behaviors (WHO, 2022).

In Indonesia, digital literacy still faces various challenges. A study by Sarah et al. found that adolescents' perceptions of digital literacy remain uneven (Sarah-Louise Jones, 2023), while research by Sujarwo et al. emphasized the importance of community-based approach to strengthen digital literacy skills (Sujarwo, Tristanti, 2022). Meanwhile, Megan et al. highlighted that social media, particularly Instagram, is a dominant channel for adolescents to access health information, despite susceptibility to misinformation and hoaxes (Megan S C Lim, Annika Molenaar, Linda Brennan, Mike Reid, 2022).

Therefore, this study aims to analyze the relationship between digital health literacy and health information-seeking behavior (HISB) among Indonesian adolescents.

METHODS

This research employed a quantitative study with a cross-sectional analytical design. he study population consisted of adolescents aged 12–19 years residing in five Indonesian provinces (East Java, West Java, Central Sulawesi, South Kalimantan, and South Sumatra). These provinces were purposively selected to represent Indonesia's geographic, socio-cultural, and digital diversity. East Java and West Java were included because they have the largest adolescent populations and the highest densities of internet users (APJII, 2023; BPS, 2023). Meanwhile, Central Sulawesi, South Kalimantan, and South Sumatra were selected to represent regions outside Java that differ in internet penetration, socioeconomic development, and cultural characteristics. This variation enabled the study to capture a broad range of digital access patterns and health information-seeking behaviors. Additionally, these provinces have reported increasing trends in tobacco and e-cigarette use among adolescents (GYTS, 2020; BPS, 2024), which aligns with the study's focus on digital exposure and health-related behaviors.

The sample was obtained using a convenience sampling technique through an online questionnaire. A total of 524 respondents met the inclusion criteria: (1) aged 12–19 years, (2) had internet access, and (3) provided informed consent to participate. Most respondents were 18 years old and therefore able to give their own consent. For participants under 18 years of age, parental or guardian approval was obtained through an additional consent field included in the online.

Recruitment was conducted online by distributing a Google Form link across popular social media platforms, including Instagram, WhatsApp, Facebook, and TikTok. Most respondents were recruited through Instagram (45%) and WhatsApp (30%), with the remainder coming from

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Facebook and TikTok. These patterns reflect the dominant social media preferences of Indonesian adolescents, who primarily use visual platforms and instant messaging applications.

The research instruments consisted of the eHealth Literacy Scale (eHEALS) (Norman and Skinner, 2006) to measure digital health literacy and the HISB instrument developed by researchers based on health information seeking indicators. The eHealth Literacy Scale (eHEALS) instrument, developed by Norman & Skinner (2006), consists of 8 Likert scale items (1 = strongly disagree to 5 = strongly agree), with a score of 8–40. This instrument was used to measure the level of digital health literacy of respondents. The Health Information Seeking Behavior (HISB) instrument, developed by the research team, consists of 12 items with indicators: search frequency, source type, information verification, and application of health information.

The instruments used in this study have undergone validity and reliability testing. The eHealth Literacy Scale (eHEALS) has been widely used in various countries and has proven valid with a Cronbach's Alpha value of 0.88 (Norman and Skinner, 2006). In this study, the Indonesian version of eHEALS was obtained through a forward–backward translation procedure and tested on 30 adolescents. The reliability test results showed a Cronbach's Alpha value of 0.87, indicating good internal consistency. Meanwhile, the Health Information Seeking Behavior (HISB) instrument was validated through item-total correlation analysis with a value range of r = 0.42–0.73 ($p < 0.05$) in 30 adolescents. The reliability test produced a Cronbach's Alpha value of 0.85, thus concluding that this instrument has adequate internal consistency. Overall, the results of the validity and reliability tests confirm that both instruments are suitable for measuring digital health literacy and health information-seeking behavior in the adolescent population in Indonesia.

Data analysis was performed in two stages: descriptive and analytical. Descriptive analysis was used to summarize respondent characteristics, digital health literacy levels, and health information-seeking behaviors. Analytical testing was conducted using Spearman's rank correlation to examine the relationship between digital health literacy and HISB, with a significance level set at $p < 0.05$.

This study received ethical approval from the Health Research Ethics Committee of STIKES Yayasan RS Dr. Soetomo (Number: KEPK/YRSDS/017b/STIKES/II/2025). Participation was voluntary, with informed consent collected online. All respondent identities were kept confidential through data anonymity.

RESULTS

A total of 524 adolescents participated in this study. The majority of respondents were female (59.5%), and most were in the 16–19 age group (62.2%). Participants were distributed across five provinces, with the largest proportion from East Java (27.1%), followed by West Java (22.9%), Central Sulawesi (18.1%), South Kalimantan (16.6%), and South Sumatra (15.3%) (Table 1). These findings indicate that the study included adolescents from a geographically diverse distribution, although the sample was still predominantly concentrated in the provinces located on the island of Java.

Table 1. Characteristics of Research Respondents

Characteristics	**Category**	**n**	**%**
Gender	Man	212	40.5
	Female	312	59.5
Age	12–15	198	37.8
	16–19	326	62.2
Province	East Java	142	27.1
	West Java	120	22.9
	Central Sulawesi	95	18.1
	South Kalimantan	87	16.6
	South Sumatera	80	15.3
Social Media Distribution	Instagram	236	45
	WhatsApp	157	30
	Facebook	79	15
	TikTok	52	10

The majority of respondents were young women in their mid- to late teens. This aligns with national data showing that Indonesian women and older adolescents are active internet users, including for seeking health information. The respondent distribution also reflects a fairly diverse regional representation,

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although provinces on the island of Java remained dominant. The online questionnaire was disseminated through social media, with most respondents recruited via Instagram (45%), followed by WhatsApp (30%), and the rest from Facebook (15%) and TikTok (10%). These findings confirm that Instagram and WhatsApp are the most effective platforms for reaching Indonesian adolescents for online research participation.

Based on measurements using the eHEALS scale, most respondents fell into the moderate digital health literacy category (46.7%), followed by the high (38.2%) and low (15.1%) categories (Table 2).

Table 2. Distribution of Respondents' Digital Health Literacy Levels

Digital Health Literacy Levels	n	%
High	200	38.2
Medium	245	46.7
Low	79	15.1

These results indicate that while most adolescents possess adequate skills in accessing and understanding digital health information, a notable proportion still has low literacy levels. This group is particularly vulnerable to misinformation and requires targeted educational interventions.

Health information-seeking behavior also varied across indicators. Most adolescents demonstrated moderate to high levels of search frequency, diversity of sources used, information verification practices, and application of health information in daily life (Table 3).

Table 3. Distribution of Respondents' Health Information Seeking Behavior

Indicator	Low n (%)	Medium n (%)	High n (%)
Frequency of information searches	84 (16.0)	218 (41.6)	222 (42.4)
Sources of information used	102 (19.5)	210 (40.1)	212 (40.5)
Verify the accuracy of the information	125 (23.9)	190 (36.3)	209 (39.9)
Application in decision making	96 (18.3)	201 (38.4)	227 (43.3)

Most adolescents reported efforts to use credible sources and verify the information they accessed, although approximately 20% still relied on less reliable sources. This highlights an important gap in the quality of health information-seeking behavior that requires further attention.

The results of the Spearman correlation test showed a significant positive relationship between digital health literacy and health information-seeking behavior ($\rho = 0.307$; $p = 0.007$) (Table 4).

Table 4. Relationship between Digital Health Literacy and Health Information Seeking Behavior

Variable	ρ (Spearman)	p-value
Digital health literacy vs HISB	0,307	0,007

These findings indicate that higher digital health literacy is associated with more active and critical health information-seeking behavior among adolescents. Conversely, low literacy increases adolescents' susceptibility to invalid or misleading health information. Correlation analysis showed a significant positive relationship between digital health literacy and health information-seeking behavior ($\rho = 0.307$, $p < 0.05$). Adolescents with high digital health literacy tend to engage more actively in seeking health information, use more credible sources (such as official health websites, academic journals, and government portals), verify the accuracy of information, and apply it appropriately in daily health decision-making. In contrast, adolescents with low literacy tend to rely heavily on social media without verification, increasing their risk of exposure to misleading or inaccurate health information.

DISCUSSION

This study demonstrates that digital health literacy has a significant relationship with health information-seeking behavior among Indonesian

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adolescents. The positive correlation (ρ = 0.307; p = 0.007) reinforces the understanding that digital literacy encompasses more than technical proficiency in using the internet; it also includes cognitive and critical skills that shape how adolescents search for, evaluate, and use health information.

The findings are consistent with studies in other countries. This is consistent with research by Lee in South Korea and Park & Liu in China, which found that higher digital health literacy supports more effective and selective health information-seeking behaviors (Hee Yun Lee, Seok Won Jin, Carrie Henning-Smith, Jongwook Lee, 2021; Diyi Liu, Shuhang Yang, Calvin Yixiang Cheng, Lin Cai, 2024).

The predominance of respondents recruited through Instagram and WhatsApp aligns with previous research showing that Indonesian adolescents frequently use visual and interactive platforms as their primary sources of health information (Karima, Pristya and Herbawani, 2023; Sutha *et al.*, 2025). This pattern highlights important implications for health promotion efforts: Instagram and WhatsApp offer substantial potential for delivering targeted, youth-friendly health information.

Adolescents with high digital health literacy are better able to sort out valid information, thus avoiding misinformation and disinformation. This is important considering that the WHO (2022) calls the infodemic phenomenon a major challenge in health promotion in the digital era. This finding aligns with a study by Liu (2024) in China, which found that students with high digital health literacy were more selective in choosing health information sources, tending to rely on official government portals or online health journals, and less likely to trust information from social media. A similar finding was also expressed by Lee (2021) in South Korea, who showed that digital health literacy was associated with increased preventive health behaviors, including seeking information on healthy eating and disease prevention.

Furthermore, digital health literacy should be viewed as a crucial determinant of adolescent health behavior in the digital age (Paakkari and Okan, 2020). Without adequate literacy skills, adolescents are vulnerable to health misinformation, especially amidst the rapid flow of the global infodemic (WHO, 2022).

The Indonesian context presents unique challenges. Although internet penetration among adolescents is very high (APJII, 2023), disparities in digital literacy remain substantial. Many adolescents rely heavily on social media as a primary source of health information, despite its susceptibility to hoaxes and disinformation. In line with this, approximately 20% of respondents in this study continued to rely on less credible sources without checking their accuracy, underscoring the need for targeted interventions.

In terms of health information-seeking behavior, the majority of adolescents in this study demonstrated moderate to high levels across key indicators, reflecting significant potential for digital-based health promotion efforts in Indonesia. However, the proportion of adolescents with high digital health literacy (38.2%) remains relatively low. This reinforces the need for educational strategies to strengthen adolescents' critical thinking and information evaluation skills. Paakkari and Okan (2020) emphasize the importance of integrating health literacy—including digital literacy—into school curricula to help adolescents navigate the increasingly complex digital information environment.

From a health promotion perspective, these findings align with the principles of health-promoting schools, which prioritize empowering adolescents to actively manage their health. Integrating formal education, digital literacy training, and evidence-based online health platforms can enhance adolescents' competence in filtering and applying health information. This study also supports WHO's (2022) emphasis on infodemic management as a key component of resilient health systems. Strengthening adolescents' digital health literacy equips them to act as agents of change within their communities by sharing accurate information and resisting misleading content.

Overall, this study provides empirical evidence that digital health literacy is a determinant of health information-seeking behavior among adolescents. Enhancing this capacity through school curricula, community-based programs, and cross-sector collaboration has the potential to cultivate a more informed, critical, and health-

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conscious generation prepared to face the challenges of the digital era. These findings also underscore the importance of school-based health education interventions that integrate digital health literacy (Nash *et al.*, 2021; Schulenkorf *et al.*, 2021). In addition, the involvement of health workers, teachers, and parents remains crucial in guiding adolescents to use digital platforms wisely as sources of health information. Policymakers should therefore prioritize the development of digital-based health promotion initiatives that not only provide accurate information but also strengthen adolescents' competencies in accessing, evaluating, and applying health information responsibly.

CONCLUSION

This study confirms that digital health literacy has a positive and significant relationship with health information-seeking behavior among adolescents in Indonesia. Adolescents with higher levels of digital literacy tend to be more critical, active, and selective when accessing online health information, while those with lower literacy are more vulnerable to misinformation and unreliable sources. These findings underscore the need to strengthen digital health literacy as an essential component of digital-based health promotion strategies, particularly for adolescents who are among the most active users of the internet.

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