

Digital Health Literacy and Mental Health Information-Seeking Behaviour Among Adolescents in Balikpapan, East Kalimantan

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Article Information

Received: September 19, 2026

Revised: October 01, 2026

Online: October 12, 2026

Keywords

Digital Health Literacy, Mental Health Information-Seeking Behavior, Adolescents, Ehealth Literacy

ABSTRACT

Indonesian adolescents increasingly rely on digital platforms as their main source for mental health information due to widespread internet access; consequently, digital health literacy is crucial to mitigate misinformation risks. The connection between digital health literacy and adolescents' mental health information-seeking behavior was analyzed in this study, which focused on those living in Balikpapan, East Kalimantan. They hypothesized a positive association. A quantitative observational analytic cross-sectional design was employed for this study, which took place in May 2026. Multistage random sampling was used to select 162 students aged 15–18 from public and private senior high schools to participate. The Indonesian eHealth Literacy Scale (I-eHEALS) was used to assess their digital health literacy. A Health Information-Seeking Behavior instrument, comprising five domains, was used to measure information-seeking behavior. Supervised online questionnaires facilitated data collection, and Spearman's rank correlation was applied for analysis. Data revealed a mean digital health literacy score of 28.74 (SD 5.12) and a mean information-seeking behavior score of 68.31 (SD 11.47), showing a significant positive moderate correlation ($\rho = 0.46, p < 0.001$). This finding indicates that higher digital health literacy was associated with more directed searching, selective source choices, improved credibility evaluation, and constructive information use. The integration of critical digital health literacy into current school-based mental health programs is suggested by these findings for local health and education authorities. Digital health literacy significantly determines how adolescents seek information about mental health. Future longitudinal studies need to include more factors and validate instruments.



Keywords: Digital Health Literacy, Mental Health Information-Seeking Behavior, Adolescents, Ehealth Literacy

INTRODUCTION

Advances in information technology have fundamentally altered how young individuals access health information. Internet penetration in Indonesia reached 79.5 percent in early 2024, encompassing approximately 221.5 million users; Generation Z constitutes a significant portion of this demographic (APJII, 2024). The internet has emerged as a primary source for health information, including resources for mental health. Given adolescents' high susceptibility to psychological issues, this is a significantly important development. For instance, the Indonesia–National Adolescent Mental Health Survey (I-NAMHS) indicated that 34.9 percent of individuals aged 10–17 experienced at least one mental health disorder symptom within the previous 12 months, yet only 2.6 percent sought services (Wahdi et al., 2023).

There is a notable research gap stemming from the scarce empirical evidence regarding the link between digital health literacy and mental health information-seeking behavior (HISB) among Indonesian adolescents, especially those in urban East Kalimantan. Previous research has primarily focused on general internet use, mental health literacy, or overall health information-seeking behavior. Adolescents' specific ability to search for, assess the credibility of, choose, and use digital mental health information has not been directly examined. The unique social, cultural, and digital environmental context of adolescents in Balikpapan City may not be accurately reflected by findings from different regions.

The digital environment inherently introduces risks of inaccurate information, further emphasizing this urgency. Disinformation was present in 6.3 percent and misinformation about psychiatric conditions in 15.7 percent of 1,000 TikTok videos on mental health from over 16 countries, according to a recent analysis (Hudon et al., 2024). Therefore, merely having wide digital access does not guarantee that young people will obtain and use valid mental health information. The ability of an individual to find, understand, evaluate the credibility of, compare, and utilize health information via digital technology defines digital health literacy (Norman & Skinner, 2006). Among children and adolescents in Germany, a study showed that problematic digital health literacy was evident in 30.76 percent, while 4.63 percent had an inadequate level, particularly concerning information reliability and privacy protection (Stauch et al., 2025).

Information-seeking behavior regarding mental health involves more than just search frequency; it also relates to the sources used, search strategies employed, credibility assessment, and information utilization. According to a review of 62 articles, mental health is emerging as an increasingly central theme in adolescents' health information-seeking behavior (Saraipour et al., 2025). Adolescents in Barcelona primarily sought mental health information using search engines, family, or friends, though some did not actively search (Angles et al., 2024). These results underscore that evaluating the quality of information seeking involves understanding not just how often information is accessed, but also the capacity to choose and assess it.

Theoretically, adolescents possessing greater digital health literacy should demonstrate enhanced capabilities in determining search strategies, identifying credible sources, and reducing their dependence on invalid information. Previous research has established a link between adolescents' mental health literacy and their help-seeking behavior (Sanguino et al., 2024). The interplay between school climate and help-seeking behavior among Indonesian adolescents is influenced by mental health literacy and stigma (Lesmana & Chung, 2024). It is important not to confuse digital health literacy with mental health literacy, as these two terms describe different competencies.

Research is especially needed within the Indonesian context. The 2023 Indonesian Health Survey (SKI) indicated that the prevalence of depression in the 15–24 age group was 2 percent, exceeding the national prevalence of 1.4 percent (Kemenkes RI, 2023). Kaligis et al. (2021) stressed the importance of instruments specifically tailored to the Indonesian context, given that knowledge, attitudes, and behaviors related to mental health are shaped by cultural factors. The prevalence of depression in East Kalimantan is 2.2 percent. The Balikpapan City Government has implemented school-based programs, such as the Mental Health School and Youth Health Cadre initiatives (Dinkes, 2025). Despite high levels of technological access in urban areas, this cannot be directly assumed to indicate digital health literacy or effective mental health information-seeking behavior.

By investigating the relationship between digital health literacy and mental health information-seeking behavior in secondary school adolescents in Balikpapan City, this study addresses a significant gap. Information-seeking behavior was operationalized by researchers through various aspects, which encompassed search frequency, sources, search strategies, credibility assessment, and information utilization. More specific empirical evidence is offered by this approach when compared to studies that only quantify internet use intensity or general mental health literacy.

The relationship between digital health literacy and mental health information-seeking behavior among adolescents in Balikpapan City, East Kalimantan, is the subject of this study's analysis. Whether a relationship exists between the level of digital health literacy and mental health information-seeking behavior in secondary school adolescents in Balikpapan is explored by the central research question. The research hypothesis (H1) postulates a positive and significant relationship between digital health literacy and mental health information-seeking behavior.

METHODS

A quantitative, observational analytic cross-sectional design was utilized in this study. The relationship between digital health literacy, which was the independent variable, and mental health information-seeking behavior, the dependent variable, was investigated by researchers. The investigation took place in May 2026.

The target population for this research consisted of students aged 15–18 years from public and private senior high schools in Balikpapan City, East Kalimantan. A multistage random sampling strategy was used, first selecting 15 schools and 3 classes, then using simple random sampling to identify eligible students. A power analysis for a two-sided correlation test was conducted in order



to determine the necessary sample size. This calculation used an alpha (α) of 0.05, a statistical power of 80%, and an anticipated effect size (r) of 0.25, yielding a minimum of approximately 123 participants. Accounting for a 10% non-response rate, the minimum sample increased to around 137 participants. A final sample of 162 respondents completed the study.

Specific eligibility criteria guided respondent selection. Participants needed to meet several inclusion criteria: (1) being 15–18 years old, (2) being actively enrolled in a selected school, (3) owning a smartphone with internet access, (4) agreeing to participate, and (5) providing parental consent in addition to informed assent or consent. Students receiving active treatment for severe mental disorders that could impede questionnaire completion faced exclusion from the study. Regarding incomplete data, respondents with more than 10% unanswered items were excluded, while those with 10% or fewer missing items had their data managed according to predetermined procedures. No analyzed respondent exceeded the specified missing data threshold.

Digital health literacy was measured by the Indonesian version of the eHealth Literacy Scale (I-eHEALS). This instrument contains eight Likert-type items, each scored from 1 to 5. With a Cronbach's alpha (α) of 0.91, the I-eHEALS in Indonesian showed good internal reliability. The Health Information-Seeking Behavior (HISB) instrument was used to evaluate mental health information-seeking behavior. Researchers developed this tool based on existing adolescent health information-seeking literature, specifically citing Saraipour et al. (2025). With its items scored on a five-point Likert scale, the HISB covers five domains: search frequency, information sources, search strategies, source credibility evaluation, and information utilization.

The Content Validity Index (CVI) evaluated content validity. A pilot test then involved 30 respondents who were not part of the main study sample. Item-total correlation assessed item-level construct validity, while Cronbach's alpha measured internal consistency. Data collection occurred through a supervised online questionnaire delivered via Google Forms. School guidance and counseling teachers provided assistance during this process. Before starting the questionnaire, respondents learned about the study's objectives, procedures, confidentiality protocols, the voluntary nature of their participation, and their right to withdraw. Both parental consent and informed assent were required from respondents under 18 years. The questionnaire, which took roughly 15–20 minutes to complete, included sections on respondent characteristics, the I-eHEALS, the HISB, and an attention-check component.

IBM SPSS Statistics version XXIII was used for data analysis. Descriptive analysis was performed by researchers, reporting frequencies, percentages, means, standard deviations, medians, and ranges as appropriate, for summarizing respondent characteristics and study variable distributions. The Shapiro–Wilk test evaluated data distribution. To examine the relationship between digital health literacy and mental health information-seeking behavior, Spearman's rank correlation was used because the study variables were based on Likert-type responses and did not meet normality assumptions. Spearman's rank correlation coefficient is denoted by ρ in this analysis, while d represents the difference between paired ranks, and n signifies the number of observations. A statistical significance level of $\alpha = 0.05$ was set. Colton's criteria interpreted correlation strength:

0.00–0.25 indicated weak, 0.26–0.50 denoted moderate, 0.51–0.75 represented strong, and 0.76–1.00 showed very strong correlations.

Ethical approval for the study, with approval number 226/EC-PKP/VIII/2026, was granted by the Research Ethics Committee. Voluntary participation was secured through informed consent or assent; for respondents under 18, parental consent was mandatory. Respondent identities stayed anonymous, and data received confidential treatment, used exclusively for research purposes. Participants also received information regarding available school counseling services in case emotional distress arose during or after their involvement.

RESULTS

162 teenagers between the ages of 15 and 18 who attended public and private high schools in Balikpapan City participated in this study. Every piece of analysed data passed the attention check for response quality and satisfied the inclusion requirements.

1. Respondent Characteristics

Table 1 presents the distribution of demographic characteristics and internet usage patterns of respondents.

Table 1. Respondent Characteristics (N = 162)

Characteristics	Category	n	Persentase (%)
Gender	Male	68	42.0
	Female	94	58.0
Age (years)	15	41	25.3
	16 – 17	100	61.7
	18	21	13.0
Grade level	X	55	34.0
	XI	61	37.7
	XII	46	28.4
Duration of internet usage per day	< 3 hours/day	29	17.9
	3–5 hours/day	67	41.4
	> 5 hours/day	66	40.7

162 teenagers from Balikpapan City's public and private senior high schools, ages 15 to 18, participated in this study. Every examined response passed the attention check and satisfied the predetermined eligibility requirements. The percentage of female respondents was somewhat higher than that of male respondents (58.0% vs. 42.0%). The majority of responders (61.7%) were between the ages of 16 and 17, followed by those who were 15 (25.3%) and 18 (13.0%). The distribution was fairly even across grade levels, with Grade XI having the highest percentage (37.7%), followed by Grade X (34.0%) and Grade XII (28.4%). There was a comparatively high level of internet exposure: 82.1% of respondents said they used the internet for at least three hours a day, with 40.7% reporting more than five hours and 41.4% reporting three to five hours. This trend suggests that the majority of participants had significant exposure to digital information settings, offering a suitable setting for evaluating online mental health information-seeking behaviour and digital health literacy.



2. Description of Digital Health Literacy and Mental Health Information Seeking Behavior

The I-eHEALS (theoretical range 8–40) was used to test digital health literacy scores. The instrument's five components were added together to determine the mental health information-seeking behaviour (HISB) scores (theoretical range 20–100). Table 2 presents descriptive results.

Table 2. Description of Digital Health Literacy Scores and Mental Health Information Seeking Behavior (N = 162)

Variables	Mean	SD	Median	Minimum	Maximum
Digital health literacy (I-eHEALS)	28.74	5.12	29.00	15	39
Mental health information seeking behavior	68.31	11.47	69.00	38	94

The average I-eHEALS score was 28.74, with a standard deviation of 5.12. The middle value, or median, was 29.00, and the scores ranged from 15 to 39. Compared to the theoretical midpoint, the average score was about 4.74 points higher, showing that people generally felt they had a moderate to relatively good level of understanding about digital health. The mean and median being fairly close also show that the scores had a steady average. Although the range shows a lot of differences, some teenagers have much lower digital health literacy compared to the average of the group. So, having a lot of exposure to digital technology among the respondents doesn't mean they all have high digital health literacy.

The average HISB score was 68.31, with a standard deviation of 11.47. The middle score, or median, was 69.00, and the scores ranged from 38 to 94. Compared to the theoretical middle point of 60, the average was 8.31 points higher, showing that people mostly reported a moderate to fairly high level of seeking mental health information. The range from 38 to 94 shows a lot of differences in how teenagers looked for, chose, judged, and used mental health information. The standard deviation of 1.47 shows that there are important differences among the respondents, meaning that not all teenagers who use digital tools a lot use them in the same way to find information effectively.

Overall, the results show that participants generally reported fairly positive levels of both their digital health knowledge and their behavior in seeking mental health information. However, the differences in both measures show that just being exposed to digital content doesn't mean all teenagers develop the same skills or ways of looking for information. These findings help set the stage for understanding the later correlation analysis.

3. The Relationship between Digital Health Literacy and Mental Health Information Seeking Behavior

The results of the Spearman correlation analysis are presented in Table 3.

Table 3. Spearman Correlation between Digital Health Literacy and Mental Health Information Seeking Behavior (N = 162)

Independent variable	Dependent variable	ρ	p-value
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Digital health literacy	Mental health information seeking behavior	0.46	< 0.001
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Spearman's rank correlation found a statistically significant moderate positive link between digital health literacy and how people seek mental health information ($\rho = 0.46$, $N = 162$, $p < 0.001$). So, teenagers who have better digital health knowledge were more likely to look for good mental health information. The positive trend shows that as digital health literacy improved, people became better at looking for, choosing, judging, and using mental health information in a more suitable way.

The study says that a ρ value of 0.46 is considered moderate based on their set guidelines. It's important to note that the result shows a link, not necessarily a cause-and-effect relationship, because the study's design doesn't show whether one thing happened before the other. The result also shows that digital health literacy is important but not the only factor that affects how people seek out mental health information. Other people, relationships between people, school environment, and other surrounding factors might cause differences in HISB.

DISCUSSION

A statistically significant, moderate positive association between high school students' digital health literacy and their mental health information-seeking behavior in Balikpapan City was uncovered by Spearman correlation analysis. This outcome suggests that adolescents demonstrating higher digital health literacy generally engage in more focused information searches, choose sources more critically, assess credibility with greater effectiveness, and apply mental health information constructively in decision-making processes. The association's moderate strength ($\rho = 0.46$), falling short of a strong or very strong link, indicates digital health literacy's importance without suggesting it as the sole determinant of adolescent mental health information-seeking. A significant portion of the variance in information-seeking behavior likely stems from unexamined individual, interpersonal, contextual, and environmental factors.

This result aligns with the Lily Model framework, which posits digital health literacy as a multifaceted construct. This framework incorporates traditional, health, information, scientific, media, and computer literacies. These combined competencies empower individuals to locate, comprehend, evaluate, and utilize health information from electronic sources. Adolescents who achieve greater mastery of these various literacies enhance their capacity across different information-seeking stages. These stages encompass various activities, including identifying information requirements, choosing search approaches, evaluating credibility, and utilizing the results of searches. Wilson's (1997) Information Behavior Model, which describes literacy and cognitive skills as intermediate factors influencing how information needs translate into active seeking behaviors, also supports this interpretation.

Numerous prior studies corroborate the current finding. Chang et al. An increased online search for health and mental health information was observed among Taiwanese adolescents during the COVID-19 pandemic, according to (2023), a trend linked to higher digital health literacy and psychological distress. In a similar vein, Gulec et al. A connection between digital health literacy and health information-seeking behavior was identified among Czech adolescents by (2022); notably,



trust in online information showed no significant impact on this relationship. A significant influence of digital health literacy on health information-seeking behavior among Jordanian adolescents was stated by Hatamlah (2024), aligning with Social Cognitive Theory. Moreover, Liu et al. Digital health literacy was shown to enhance both engagement with online health information and its integration into daily health practices, as per (2024). Kim et al.'s (2022) systematic review and meta-analysis offer additional support, demonstrating a generally positive correlation between digital health literacy and various health-related behaviors, such as information-seeking.

Nevertheless, an interpretation of these results must account for data indicating that this relationship varies among diverse populations. For instance, Papp-Zipernovszky et al. No significant correlation ($r = 0.241$; $p = 0.191$) was found by (2021) linking digital health literacy and how often Hungarian Generation Z individuals searched for health information online. Partial causes for this disparity might include variations in sample attributes, socio-cultural and digital contexts, and the measurement tools employed. To assess five dimensions of mental health information-seeking behavior, high school adolescents in Balikpapan were specifically investigated in this study using the HISB instrument. The comparison study, in contrast, used a general measure of health information-seeking. Due to these methodological inconsistencies, the relationship between digital health literacy and information-seeking behavior may differ based on the specific population, the information area, the measurement method, and the wider socio-digital context.

1. Research Limitations

When interpreting these results, several limitations require careful attention. Initially, the cross-sectional design of the study restricts the ability to infer causation. An association between digital health literacy and mental health information-seeking behavior can be identified through their simultaneous measurement. However, this design cannot determine whether greater digital health literacy causes improved information-seeking, if frequent information seeking fosters digital health literacy, or if the relationship is bidirectional.

Secondly, despite the participation of 162 adolescents, both the sample size and the scope of the population were restricted to students from chosen public and private high schools within Balikpapan City. Consequently, full generalizability of the findings to adolescents outside formal education, different age groups, or populations in distinct geographic, socioeconomic, and digital environments remains uncertain. Consequently, the moderate correlation should be interpreted in the context of the study population's specific characteristics, not as a universal phenomenon.

Thirdly, constraints are also present regarding the measurement instruments. The Indonesian version of I-eHEALS assessed digital health literacy, demonstrating good internal reliability within this study. Although the HISB instrument was created by researchers using constructs from existing literature, and was subjected to content review and pilot testing, its psychometric standardization has not been thoroughly established, especially for Indonesian adolescents. This measurement constraint could explain some of the unmeasured variability in the observed relationship, indicating a need for additional validation of the instrument within larger and more varied adolescent groups.

Fourth, the sampling process, despite using multistage random sampling, might limit representativeness. By recruiting from schools, adolescents who have exited the education system or who systematically vary from current students in terms of digital resource access, mental health information, and support structures are excluded. Consequently, the results are chiefly representative of adolescents attending school within the specific study context.

Fifth, several potentially crucial confounding variables were not directly measured. Among these unmeasured factors are parental guidance, the stigma associated with mental health, support from peers, psychological suffering, the drive to find information, previous experience with mental health education, and the availability of professional health services. Such factors have the potential to influence both the digital health literacy and the information-seeking behaviors of adolescents. Because these were not included, the observed correlation cannot be understood as digital health literacy's independent effect. The moderate strength of the association also suggests that several factors may be at play concurrently.

2. Hypothesis and Direction for Future Research

These findings lead to several hypotheses that can be tested in future research, rather than treating the suggested mechanisms as proven. Subsequent studies should first investigate whether parental mediation, peer social support, mental health stigma, psychological distress, and involvement with school-based mental health education act as mediators or moderators in the connection between digital health literacy and mental health information-seeking behavior. Secondly, future research should explore if digital health literacy acts as a prerequisite cognitive state, while motivation, perceived necessity, social support, and situational accessibility influence whether that capacity evolves into actual, optimal information-seeking behavior. Even with sufficient technical and evaluative abilities, adolescents might not actively look for or properly utilize mental health information if their perceived need or motivation is lacking.

A third point is that the psychometric properties of the HISB instrument necessitate additional examination through validation efforts on a larger scale. Such assessment should encompass construct validity, criterion-related validity, test-retest reliability, and measurement invariance when suitable. This work would aid in determining if the moderate association identified in this study truly reflects the substantive relationship between constructs or if it is partially affected by measurement characteristics.

To establish temporal directionality and, where possible, causal effects, future research ought to employ longitudinal, prospective, or experimental designs as well. Structured digital health literacy programs could be specifically tested through intervention studies to see if they enhance adolescents' capacity to identify credible mental health sources, evaluate misinformation, formulate appropriate searches, and convert information into suitable help-seeking or health-related actions. Such studies would offer stronger evidence regarding whether improvements in digital health literacy lead to meaningful enhancements in mental health information-seeking behavior.



CONCLUSIONS

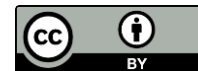
Adolescents' digital health literacy and their mental health information-seeking behavior showed a statistically significant moderate positive relationship. This finding specifically involved students in public and private high schools across Balikpapan City, East Kalimantan, showing a correlation of $q = 0.46$, with $p < 0.001$. Adolescents exhibiting greater digital health literacy generally displayed more focused information-seeking approaches. When assessing information sources, they also displayed greater selectivity and utilized mental health information more constructively. The relationship, however, registered as moderate, not strong, suggesting digital health literacy by itself does not fully account for optimal mental health information-seeking behavior.

These findings carry significant practical implications. Digital health literacy, the data indicate, represents a necessary element for optimal mental health information seeking in adolescents but remains insufficient on its own. Educational interventions should therefore expand beyond merely teaching adolescents to access digital information. Such programs should also integrate the critical appraisal of source credibility, the recognition of misinformation, and the appropriate interpretation of mental health information. Adolescents need to be guided on when to get help from trusted adults, school services, or health professionals. These skills could be integrated by the Balikpapan City government through schools and community health centers into existing adolescent health and mental health education programs, such as Mental Health School and Youth Health Cadre.

Future research efforts should employ longitudinal or experimental designs. These designs would help clarify causal direction and enable the evaluation of digital health literacy interventions' effectiveness. Studies ought to incorporate potential confounding and contextual variables as well. Illustrative examples include variables such as parental mediation, mental health stigma, peer social support, psychological distress, motivation, and access to professional services. It is also suggested by researchers that the HISB instrument undergo further psychometric validation for Indonesian adolescents. The reliability, validity, and generalizability of these findings would be further enhanced by replication in various regions and socioeconomic contexts.

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Miracle Get Journal, Vol. 03, No. 3, August 2026

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