

Digital literacy as a predictor of mental health understanding among adolescent: evidence from Yogyakarta, Indonesia

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Abstract. Adolescents are increasingly exposed to digital environments that shape their mental health awareness through access to and processing of online information. However, evidence on this relationship in Indonesia remains limited. This study aimed to examine whether digital literacy predicts adolescents' understanding of mental health issues in the context of Yogyakarta. This cross-sectional study involved 350 high school students in Yogyakarta, chosen by a multistage random sampling technique. Data were obtained through two standardized instruments the *Digital Literacy Scale for Adolescents (DLSA)* and the *Mental Health Awareness Scale (MHAS)*. The analytical procedure comprised descriptive analyses followed by correlation testing and multivariate regression techniques. Digital literacy showed a significant positive correlation with mental health awareness ($r = 0.52$, $p < 0.001$). Regression analysis revealed that digital literacy was the strongest predictor ($\beta = 0.45$, $p < 0.001$), accounting for 26% of the variance ($R^2 = 0.26$) in mental health awareness. Internet use exceeding six hours daily was negatively associated ($\beta = -0.11$, $p = 0.041$). Adolescents understanding of mental health issues is strategically enhanced by digital literacy. Including digital literacy in public health initiatives and school curricula could improve resilience and long-term psychological health.

1 Background

The prevalence of mental disorders in adolescents varies greatly. Some studies report figures between 5% and 22% [1] While others estimate a global combined prevalence of around 13.4%. Specific disorders such as anxiety and depressive disorder have prevalence rates of 6.5% and 2.6%, respectively. This condition has an impact on declining academic performance quality of life as well as increasing the risk of harmful behaviours including substance abuse and suicide [2]. In Indonesia, the I-NAMHS survey shows that around 17 million adolescents (aged 10–17 years) are vulnerable to mental health problems. However, only 2.6% have sought professional help in the past year. This situation is exacerbated by

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increasingly intense exposure to digital media, which often triggers anxiety, mood disorders as well as suicidal ideation especially when media use shows signs of addiction, such as mood swings when not online [4]. Therefore, increasing mental health awareness in adolescents is an important step in early prevention and promotion efforts of mental health at the global and national levels.

In the information age, digital literacy has become a crucial competency. adolescents must possess the capacity to critically seek, assess, and apply health information. A study in Germany noted that about 30% of adolescents have problematic digital health literacy and demographic variables are closely related in this disparity. Furthermore, e-health literacy has been demonstrated to predict a number of health-promoting behaviors, including stress management, physical activity, and diet, according to cross-sectional research conducted in Turkey; however, it has not been explicitly studied in relation to mental health awareness. In Indonesia, digital literacy problems are also related to the quality of life of adolescents, for example in those addicted to online games. Additionally, in the digital age, adolescents' mental health has gotten worse due to home education that is unsuitable for Generation Z kids [5].

. However, most of these studies still focus on interventions or theoretical narratives, and none have examined quantitatively (cross-sectionally) the connection between digital literacy level and mental health awareness, especially in Indonesia or similar regions. Other literature also shows that social factors such as bullying play an important role in adolescent psychological states [6]. Family support and self-regulation skills have also been shown to be protective factors that increase academic resilience and psychological well-being [7].

The integration of digital literacy and mental health awareness as quantitatively quantified through a cross-sectional rather than interventional methodology is one of the two primary unique components of this study. Second, this study focuses on Indonesian high school students who have not received enough attention in the country's and the world's literature. As a result, this study closes the gap in international-local research on the relationship between digital literacy and mental health awareness and offers empirical data supported by evidence that can serve as the foundation for digital mental health promotion initiatives in communities and schools. Adolescent mental health in Indonesia continues to encounter several obstacles, particularly in cities like Yogyakarta where there is a high level of digital exposure. Due to its reputation as a student city and the large number of teenagers and students living there, Yogyakarta is a demographic that is particularly vulnerable to social change, academic pressure, and excessive exposure to digital media.

The Special Region of Yogyakarta has a 9.3% prevalence of mental and emotional illnesses, which is higher than the national average, according to data from Riskesdas [8]. This condition suggests that Yogyakarta's youth require a more creative marketing approach, particularly by using digital literacy as a gateway to raise awareness of mental health issues. among order to serve as the foundation for school- and community-based interventions, research that looks at the relationship between digital literacy and mental health awareness among Yogyakarta teenagers is highly pertinent. Through cross-sectional surveys and the analysis of demographic variables and digital conditions as covariates, the study seeks to determine the degree to which digital literacy can predict teenagers' awareness of mental health issues. The following are some advantages of this research: (a) it gives education and health policy makers empirical data regarding digital literacy-based interventions ; (b) it supports the creation of a digital literacy curriculum that includes mental health content ; (c) it provides early screening indicators on vulnerable groups of adolescents who lack awareness; and (d) it strengthens the theoretical foundation for additional research and interventions from the field of digital health promotion.

2 Methods

This study used a cross-sectional, quantitative approach to investigate the predictive impact of digital literacy on mental health awareness among adolescents in Yogyakarta. The population consisted of students aged 15–18 years from public and private high schools, as well as vocational schools. A total of 350 students were selected through multistage random sampling to represent variations across school types and urban–suburban areas. The sample size exceeded the minimum requirement of 77 respondents, as determined by Gower analysis ($f^2 = 0.15$, $\alpha = 0.05$, power = 0.80), ensuring adequate statistical power and external validity.

The research instruments comprised three parts: (1) the Digital Literacy Scale for Adolescents (DLSA) to measure the ability to critically access, evaluate, use, and create digital content; (2) the Mental Health Awareness Scale (MHAS) to assess knowledge, stigma, and attitudes toward mental health; and (3) a demographic questionnaire covering age, gender, school type, internet use intensity, and gadget access. All scales were translated using a forward–backward translation procedure, validated by public health and psychiatric nursing experts, and demonstrated acceptable reliability (Cronbach’s $\alpha \geq 0.7$).

Data were collected both online (using Google Forms) and offline (in classrooms under the researcher’s supervision). Participation was voluntary, and informed consent was obtained before data collection. Ethical approval was granted by the Health Research Ethics Committee of STIKES Surya Global Yogyakarta (No.8.11/KEPK/SSG/VII/2025). Data were analysed using IBM SPSS Statistics.

3 Results and discussion

3.1 Results

Table 1. Characteristic distribution of respondents (N = 350)

Characteristics	Category	n	%
Gender	Male	160	45.7
	Female	190	54.3
Age	15	85	24.3
	16	110	31.4
	17	100	28.6
	18	55	15.7
Type of School	State High School	180	51.4
	Senior High School	95	27.1
	Vocational High School	75	21.5
Internet Intensity	< 3 hours/day	70	20.0
	3–6 hours/day	180	51.4
	> 6 hours/day	100	28.6

The distribution of respondent characteristics can be seen in Table 1. This study involved 350 adolescent respondents from high school and vocational schools in Yogyakarta City. Most respondents were female (54.3%), with the highest age distribution being 16 (31.4%). Most respondents came from public high schools (51.4%), and more than half (51.4%) used the internet for 3-6 hours daily.

Table 2. Digital literacy and mental health awareness score distribution

Variable	Mean	SD	Min	Max
Digital Literacy (DLSA)	72.5	8.9	50	95
Mental Health Awareness (MHAS)	68.7	9.5	45	92

The average digital literacy score (DLSA) is 72.5 (SD=8.9), while the average mental health awareness score (MHAS) is 68.7 (SD=9.5). These results show that, in general, adolescents have relatively moderate to high levels of digital literacy and mental health awareness (Table 2).

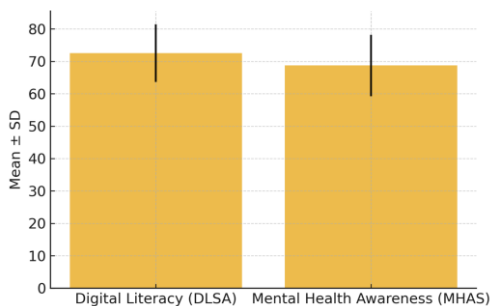


Fig.1. Mean scores of digital literacy and mental health awareness among adolescents

As illustrated in Figure 1, adolescents showed a slightly higher mean score in digital literacy compared to mental health awareness. The difference reflects that while students are generally proficient in digital technology, their understanding and attitudes toward mental health remain moderate.

Table 3. Correlation between digital literacy and mental health awareness

Variable	r	p-value
Digital Literacy ↔ Mental Health Awareness	0,52	<0,001

Digital literacy and mental health awareness were shown to be significantly positively correlated by the Pearson correlation test ($r=0.52$; $p<0.001$), indicating that the higher the digital literacy, the higher the mental health awareness level (Table 3).

Table 4. Multiple linear regression analysis results: predictors of mental health awareness

Predictor	B	SE	Beta	t	p-value
Constanta	25,3	4,2	–	6,02	<0,001
Digital Literacy	0,48	0,06	0,45	8,00	<0,001
Age	0,35	0,15	0,10	2,33	0,020
Gender (0=M,1=F)	2,10	0,95	0,12	2,21	0,027
Internet Intensity (>6 jam)	-1,85	0,90	-0,11	-2,05	0,041

Demographic characteristics (age, gender, and level of internet use) were included as covariates in multiple linear regression analysis. The most important predictor of mental health awareness was determined to be digital literacy ($\beta=0.45$; $p<0.001$). Additionally, there was a positive correlation between mental health awareness and both female gender ($\beta=0.12$; $p=0.027$) and age ($\beta=0.10$; $p=0.020$). However, there was a significant negative link ($\beta=-0.11$; $p=0.041$) between spending more than six hours a day online and being aware of mental health issues. This regression model explains 34% of the variation in mental health awareness ($R^2=0.34$; $F=44.6$; $p<0.001$) (Table 4).

3.2 Discussion

The findings showed a strong and favourable correlation between teenage mental health awareness and digital literacy ($r = 0.52$; $p < 0.001$). According to regression analysis, digital literacy accounted for 26% of the variance in mental health awareness ($R^2 = 0.26$), making

it the strongest predictor ($\beta = 0.45$; $p < 0.001$). These results imply that teenagers who are more digitally literate typically comprehend and are more conscious of mental health issues. This finding supports previous studies, which have shown that digital literacy enhances psychological well-being by promoting informed help-seeking and reducing exposure to misinformation [9].

Digital literacy serves not only as a technical skill but also as a protective cognitive competence, enabling adolescents to critically evaluate online information and avoid stigma or false beliefs related to mental illness [10]. In the digital age, where adolescents rely heavily on social media for health information, such literacy helps them differentiate between credible sources and misleading content, mitigating the risks of self-diagnosis or maladaptive behaviours [11]. This capacity to filter information positions digital literacy as a psychological safeguard in maintaining adolescents' mental health.

Age and gender also influenced mental health awareness, with older and female students scoring higher, consistent with previous findings [12]. These patterns may be related to developmental and socio-emotional factors older adolescents exhibit higher levels of reflective thinking, while girls are generally more open to discussing emotional issues [13]. Nevertheless, these factors contributed less than digital literacy, highlighting that improving digital competence remains a more universal strategy for all adolescent groups, regardless of demographic variations.

On the other hand, mental health awareness was inversely correlated with excessive internet use (>6 hours per day) ($\beta = -0.11$; $p = 0.041$), confirming long-term evidence that compulsive media use is linked to anxiety and sadness. [14]. This suggests that the quality of digital engagement, guided by literacy, is more important than duration alone. Promoting digital well-being through literacy education can prevent problematic internet use (PIU) and enhance healthy online interactions [15].

This study adds fresh quantitative data from Indonesia, where prior research has mostly relied on qualitative analysis or digital-based interventions. Future longitudinal or experimental research is required to confirm if increased digital literacy results in increased mental health awareness or vice versa, as the cross-sectional approach restricts causal inference. Furthermore, the single-region sample (Yogyakarta) restricts the generalizability of the results, and the self-report nature of the data may add bias. Future studies should include mixed techniques, multi-regional samples, and contextual elements as cultural effects, social media environments, and family support. Notwithstanding these drawbacks, the results highlight how crucial it is to strategically incorporate digital literacy into public health initiatives and school curriculum in order to support long-term adolescent mental health.

4 Conclusion

This study confirms that digital literacy is a significant predictor of adolescents' mental health awareness. Beyond technical proficiency, digital literacy represents a cognitive competence that enables young people to access and critically interpret mental health information. By equipping adolescents with these skills, schools and communities can foster resilience and reduce the psychological risks associated with unhealthy internet use.

The findings highlight the strategic significance of integrating digital literacy into national health education programs and school curricula as part of efforts to support adolescent mental health. Improving digital literacy can contribute to long-term improvements in mental health and align with Indonesia's broader goals for the development of its educational and health systems.

Longitudinal or mixed-method designs should be used in future research to elucidate causal pathways and look at contextual elements including cultural values, societal norms,

and family support. Additionally, conducting more research in a variety of geographical areas will strengthen the empirical basis for evidence-based interventions and improve the generalizability of results.

Acknowledgement

The authors would like to express their deepest gratitude to Universitas Muhammadiyah Yogyakarta for the fellowship support that made this research possible. The fellowship provided not only financial assistance but also access to academic resources and a supportive scholarly environment that greatly enhanced the quality of this study. The authors also sincerely thank the faculty members, research team, and partner schools in Yogyakarta for their invaluable cooperation and assistance during the data collection process. Special appreciation is extended to all student participants who generously contributed their time and insights, without whom this research would not have been completed.

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