

Digital Health Literacy and Healthy Lifestyle Behaviors Among Migrant University Students Living in Boarding Houses Near Campus

Annisa Fitri Nasution¹, Mahfuzi Irwan^{2*}, Mita Aulia³, Chintia Mentari⁴

¹⁻⁴Universitas Negeri Medan, Medan, Indonesia

ABSTRACT

This study aims to analyze the level of digital health literacy among migrant students living in boarding houses near campus and its association with healthy lifestyle behaviors. This study employed a quantitative approach using a survey design. Data were collected from migrant university students residing in boarding houses through a questionnaire based on the digital health literacy framework, encompassing four core dimensions: *access*, *understand*, *appraise*, and *apply*. Descriptive statistical analysis was used to examine patterns of digital health literacy and health-related behaviors. The findings indicate that most students demonstrate strong abilities in accessing and understanding digital health information, particularly through the internet and social media platforms. Students also show a relatively high level of awareness in verifying health information sources. However, a proportion of respondents remain uncertain when appraising the credibility of digital health information. In terms of application, the majority of students report engaging in positive health behaviors, including maintaining personal and environmental hygiene, regulating diet and hydration, performing light physical activity, and adopting adaptive coping strategies to support mental health. This study concludes that digital health literacy plays a significant role in shaping healthy lifestyle behaviors among migrant university students. Strengthening evaluative and applicative competencies through targeted digital health literacy education and campus-based health promotion programs is essential to support sustainable health behaviors in the digital era.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis tingkat literasi kesehatan digital mahasiswa perantauan yang tinggal di kos sekitar kampus serta keterkaitannya dengan perilaku hidup sehat. Penelitian ini menggunakan pendekatan kuantitatif dengan desain survei. Data dikumpulkan dari mahasiswa perantauan yang tinggal di kos menggunakan kuesioner berbasis kerangka digital health literacy yang mencakup empat dimensi utama, yaitu *access*, *understand*, *appraise*, dan *apply*. Analisis data dilakukan secara deskriptif untuk menggambarkan pola literasi kesehatan digital dan perilaku kesehatan mahasiswa. Hasil penelitian menunjukkan bahwa sebagian besar mahasiswa memiliki kemampuan yang baik dalam mengakses dan memahami informasi kesehatan digital, terutama melalui internet dan media sosial. Mahasiswa juga menunjukkan tingkat kesadaran yang cukup tinggi dalam memverifikasi sumber informasi kesehatan. Namun, masih terdapat sebagian responden yang ragu dalam mengevaluasi kredibilitas informasi kesehatan digital. Dari sisi penerapan, mayoritas mahasiswa telah menunjukkan perilaku hidup sehat, seperti menjaga kebersihan diri dan lingkungan, mengatur pola makan dan hidrasi, melakukan aktivitas fisik ringan, serta menerapkan strategi coping positif untuk menjaga kesehatan mental. Penelitian ini menyimpulkan bahwa literasi kesehatan digital berperan penting dalam membentuk perilaku hidup sehat mahasiswa perantauan. Penguatan dimensi evaluatif dan aplikatif melalui edukasi literasi kesehatan digital dan program promosi kesehatan berbasis kampus sangat diperlukan untuk mendukung keberlanjutan perilaku sehat di kalangan mahasiswa.

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* **Corresponding Author:** Mahfuzi Irwan (mahfuziirwan@gmail.com)



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Introduction

Health literacy has emerged as a critical determinant of individual and population health in the context of increasingly complex healthcare systems and digital information environments. Defined as the ability to access, understand, evaluate, and apply health related information for appropriate health decision making, health literacy is closely associated with health behaviors, disease prevention, and overall well being (Nutbeam, 2000; Sørensen et al., 2012). Inadequate health literacy has been linked to unhealthy lifestyle behaviors, delayed healthcare utilization, and poorer health outcomes, particularly among young adults who are navigating new social and environmental demands.

University students represent a unique population in health literacy research, as they are simultaneously characterized by high digital exposure and transitional life circumstances. For migrant university students those who relocate from their hometowns to pursue higher education the challenge is even greater. Living independently in boarding houses near campus requires students to manage their own health related decisions, including nutrition, physical activity, hygiene, sleep patterns, and mental health, often without direct family supervision. Previous studies suggest that migrant students are more vulnerable to unhealthy behaviors due to lifestyle changes, academic stress, and limited social support (Hunt & Eisenberg, 2010; Zhang et al., 2022). The rapid expansion of digital technologies has transformed the way students obtain health information. Digital platforms, including search engines, social media, and health applications, have become primary sources of health related knowledge. While digital access offers opportunities for self-care and health empowerment, it also presents significant risks related to misinformation, commercial bias, and low quality health content (Chou et al., 2018). Consequently, digital health literacy the capacity to effectively navigate digital health information has become a crucial skill for young adults, particularly those living independently (van der Vaart et al., 2020).

In the Indonesian context, research on health literacy among university students remains limited, particularly studies that focus on migrant students living in boarding houses around campus. Existing studies tend to emphasize general student populations or focus on specific health behaviors without examining the broader literacy framework that underpins health decision making. Moreover, few studies integrate both physical and mental health dimensions within the concept of digital health literacy. This gap is particularly relevant given Indonesia's growing digital penetration and the increasing reliance of young adults on online health information. Therefore, this study aims to analyze the level of digital health literacy among migrant university students living in boarding houses near campus and to examine its relationship with healthy lifestyle behaviors. By adopting a comprehensive literacy framework and focusing on a population that is often overlooked, this study contributes to the growing body of health literacy research in higher education settings. The findings are expected to provide empirical evidence to support the development of targeted health promotion programs and digital health education initiatives within universities, ultimately enhancing students' capacity to manage their health effectively in the digital era.

Method

Research Design

This study employed a descriptive quantitative research design to examine the level of digital health literacy among migrant students living in boarding houses around the campus, as

well as its association with their physical health behaviors and mental health awareness. A descriptive approach was chosen to provide an empirical and objective portrayal of students' health-related competencies and behaviors without manipulating research variables. This design is appropriate for capturing patterns of digital health information use and health-related decision-making among young adults in natural settings.

Participants and Sampling

The participants consisted of 52 migrant students who were currently living in boarding houses (kost) around campus areas. Migrant students were selected because they represent a vulnerable group that must independently manage their health behaviors while facing academic pressure, social adaptation, and limited family support.

Participants were recruited using purposive sampling, with the following inclusion criteria:

1. active undergraduate students (minimum second semester),
2. living in a boarding house for at least three months, and
3. actively accessing digital health information at least twice per month.

This sampling technique was considered appropriate to ensure that respondents possessed characteristics relevant to the research objectives.

Research Instrument

Data were collected using a structured online questionnaire distributed via Google Forms. The instrument was developed by adapting established theoretical frameworks of health literacy, particularly Nutbeam's health literacy model and the Digital Health Literacy Instrument (DHLI) developed by van der Vaart et al.

Table 1. Structure of the Research Instrument and Measurement Dimensions

Variable	Dimension	Conceptual Definition	Sample Indicators
Digital Health Literacy	Access	Ability to search for and obtain health information through digital media	Searching health information via search engines, social media, or health-related websites when experiencing symptoms
	Understand	Ability to comprehend health-related terms, messages, and explanations presented in digital content	Understanding common medical terms and health messages found in digital platforms
	Appraise	Ability to critically evaluate the credibility, accuracy, and reliability of digital health information	Distinguishing trustworthy health information from misinformation or promotional content
	Apply	Ability to use digital health information to make appropriate health decisions and adopt healthy behaviors	Applying health information to seek medical care, adjust lifestyle, or prevent illness
Physical Health Behaviors	—	Daily behaviors related to physical health maintenance	Dietary regulation, hydration, physical activity, sleep quality, hygiene practices, avoidance of smoking/vaping
Mental Health Awareness	—	Awareness and management of psychological well-being	Stress recognition, emotional regulation, coping strategies, willingness to seek help
Response Scale	—	Measurement scale used for all items	Five-point Likert scale (1 = strongly disagree to 5 = strongly agree)

These dimensions reflect the progression of health literacy skills proposed by Nutbeam (2000) and are consistent with the DHLI framework, which emphasizes functional, interactive, and critical competencies in digital health contexts.

In addition to digital health literacy, the questionnaire included items measuring:

- **Physical health behaviors**, such as dietary patterns, physical activity, sleep habits, hygiene practices, hydration, and avoidance of smoking or vaping, adapted from national health behavior guidelines;

- **Mental health awareness**, including stress recognition, emotional regulation, coping strategies, and willingness to seek help, based on prior studies of student mental well-being.

All items were measured using a **five-point Likert scale**, ranging from strongly disagree to strongly agree.

Validity and Data Collection

Content validity was assessed through expert judgment involving two academics with expertise in public health and educational psychology to ensure clarity, relevance, and theoretical alignment of the questionnaire items. Data collection was conducted online on **26 November 2025** through social media platforms such as WhatsApp and Instagram. Participation was voluntary, and respondents completed the questionnaire based on their personal experiences while living in boarding houses.

Data Analysis

The collected data were analyzed using descriptive statistical techniques, including frequencies, percentages, and mean scores for each indicator and dimension. This analysis aimed to provide a comprehensive overview of students' digital health literacy levels across the four dimensions (*access, understand, appraise, apply*), as well as their physical and mental health behaviors. Descriptive analysis was deemed suitable to identify general trends and patterns relevant to the study objectives and to support interpretation within the digital health literacy framework.

Result and Discussion

Overview of Digital Health Literacy and Healthy Lifestyle Behaviors

Table 1 presents a summary of migrant students' digital health literacy and healthy lifestyle behaviors based on twenty key indicators. The indicators were organized to reflect the four dimensions of digital health literacy access, understand, appraise, and apply as well as related physical and mental health practices. Overall, the results indicate that most respondents demonstrated moderate to high levels of digital health literacy, accompanied by generally positive health behaviors, although certain dimensions showed areas requiring further improvement.

Table 2. Summary of Research Findings on Digital Health Literacy and Healthy Lifestyle Behaviors

No.	Dimension / Indicator	Key Findings (Agreement %)	Brief Interpretation
1	Searching health information online when experiencing symptoms	Agree 61.5%; Strongly agree 32.7%	Internet is the primary initial source for health information among migrant students
2	Ability to distinguish credible and non-credible health information	Agree 53.8%; Strongly agree 30.8%; Doubtful 11.5%	Most students show evaluative skills, but some remain uncertain in source verification
3	Caution before sharing health information on social media	Strongly agree 63.5%; Agree 34.6%	High awareness of social responsibility in health information dissemination
4	Checking source authenticity before trusting health information	Agree 59.6%; Strongly agree 36.5%	Students increasingly practice fact-checking behaviors
5	Willingness to seek medical examination when symptoms persist	Agree 61.5%; Strongly agree 26.9%	Balanced use of digital information and professional medical services
6	Trust in medical professionals over influencers	Strongly agree 45.1%; Agree 47.1%	Clear preference for credible, professional health sources
7	Understanding common medical and health-related	Agree 61.5%	Adequate functional health literacy among students

8	terms Awareness of promotional content disguised as health information	Agree 69.2%; Strongly agree 15.4%	Strong critical awareness toward commercial health content
9	Conducting additional verification of health tips from social media	Agree 64.7%; Strongly agree 21.6%	Advanced evaluative digital literacy is evident
10	Maintaining cleanliness of boarding house bathrooms	Strongly agree 55.8%; Agree 42.3%	High environmental health awareness and preventive behavior
11	Efforts to maintain regular eating patterns	Agree 58.8%; Strongly agree 25.5%; Doubtful 13.7%	Majority maintain healthy eating, though consistency remains a challenge
12	Engaging in light physical activity	Agree 71.2%; Strongly agree 13.5%	Students adopt practical and sustainable physical activity habits
13	Maintaining adequate sleep quality	Agree 53.8%; Strongly agree 17.3%; Doubtful 13.5%	Awareness of sleep importance is high, though routines vary
14	Avoiding smoking and vaping	Agree 58.8%; Strongly agree (majority)	Strong preventive health orientation
15	Limiting fast food and sugary drink consumption	Agree 58.8%	Conscious dietary control despite independent living challenges
16	Drinking sufficient water daily	Agree 57.7%; Strongly agree 32.7%	Good basic health maintenance behavior
17	Awareness of the importance of mental health	Strongly agree 53.8%; Agree 44.2%	Very high mental health awareness
18	Ability to recognize stress symptoms	Agree 59.6%; Strongly agree 19.2%; Doubtful 19.2%	Most students can identify stress, but some need further guidance
19	Willingness to seek help when facing serious problems	Agree 55.8%; Strongly agree 21.2%; Doubtful 11.5%	Help-seeking intention exists, but psychological barriers remain
20	Engaging in positive coping activities	Agree 71.4%	Strong adaptive coping strategies and resilience

Results Based on Digital Health Literacy Dimensions

The access dimension shows that a large proportion of students actively seek health information online when experiencing health-related symptoms. More than 90% of respondents agreed or strongly agreed that they rely on the internet as an initial source of health information. This finding indicates that digital platforms play a central role in supporting independent health management among migrant students living in boarding houses.

In the understand dimension, most respondents reported the ability to comprehend commonly used health and medical terms presented in digital content. This suggests that students possess adequate functional health literacy, enabling them to interpret basic health information related to diet, physical activity, sleep, and mental well-being. However, some respondents expressed uncertainty when encountering more complex health information, indicating partial limitations in comprehension depth.

The appraise dimension reveals that while most students demonstrate awareness of the importance of verifying health information sources, a notable minority remains uncertain in distinguishing credible information from unreliable or promotional content. Although a majority reported checking the authenticity of health information and conducting additional searches to confirm health tips found on social media, the presence of doubtful responses suggests that critical evaluation skills are not yet uniformly developed among all students.

In the apply dimension, the results show that many students are able to translate digital health information into practical health behaviors. The majority of respondents reported maintaining personal hygiene, regulating eating patterns, engaging in light physical activity, ensuring adequate hydration, avoiding smoking and vaping, and practicing positive coping strategies for mental health. These findings indicate that digital health literacy is reflected in students' daily lifestyle choices. Nevertheless, behaviors requiring long-term consistency, such as maintaining regular sleep schedules and seeking professional help for mental health issues, showed slightly lower agreement levels, suggesting the influence of contextual and psychological barriers.

Mental Health Awareness and Coping Practices

Beyond physical health behaviors, the results demonstrate high awareness of the importance of mental health. Nearly all respondents acknowledged the significance of mental well-being and reported engaging in adaptive coping activities, such as hobbies, exercise, religious practices, and social interaction. However, a proportion of students expressed hesitation in seeking external help when facing serious problems, indicating the persistence of stigma or limited access to mental health support services.

Access to Digital Health Information

The results indicate that most migrant students living in boarding houses demonstrated a good level of ability to access digital health information. Respondents reported frequently using search engines, social media platforms, and health-related websites to obtain information about physical health, nutrition, exercise, and mental well-being. This finding reflects the high level of digital exposure among university students and supports previous studies showing that young adults rely heavily on online sources as their first point of reference for health-related concerns (Zhang et al., 2022; van der Vaart et al., 2020).

For migrant students who live independently and are separated from family support systems, digital platforms serve as a practical and immediate source of health information. However, reliance on digital access alone does not guarantee appropriate health decision-making. Without adequate skills in understanding and evaluating information, easy access may increase exposure to misleading or low-quality content (Chou et al., 2018). Therefore, access represents a foundational but insufficient component of digital health literacy.

Understanding Digital Health Information

In terms of understanding, the findings show that most respondents were able to comprehend general health messages, including information related to healthy eating, sleep hygiene, and stress management. This suggests that students possess sufficient functional health literacy to interpret basic health information presented in digital formats. Such competence is consistent with Nutbeam's (2000) concept of functional health literacy, which emphasizes basic reading and comprehension skills.

Nevertheless, the data also indicate that students experienced difficulties when encountering complex medical terminology or contradictory health messages online. This challenge has been documented in previous studies, which note that even digitally literate students may struggle to fully understand health information that lacks clear explanations or uses technical language (Osborne et al., 2013). These findings imply that understanding digital health information among migrant students remains partial and context-dependent, highlighting the need for clearer, student-oriented health communication.

Appraising the Credibility of Digital Health Information

The appraisal dimension emerged as one of the weakest aspects of digital health literacy among respondents. While students actively accessed and understood health information, many expressed uncertainty in evaluating the credibility and reliability of online sources, particularly content shared through social media. Some respondents reported difficulty distinguishing between information produced by health professionals and content generated by influencers or commercial entities.

This finding is consistent with international research demonstrating that appraisal skills

are often underdeveloped among young adults, even in populations with high digital engagement (Laursen, 2021; Zhang et al., 2022). According to Nutbeam (2000), critical health literacy—represented by appraisal skills requires higher-order cognitive abilities and is strongly influenced by educational experiences. Limited appraisal capacity may increase susceptibility to misinformation, which poses significant risks in health-related decision-making, especially for students managing their health independently.

Applying Digital Health Information to Daily Life

Despite limitations in appraisal skills, the findings indicate that many students were able to apply digital health information to their daily lives. Respondents reported adopting healthier behaviors such as maintaining personal hygiene, regulating sleep patterns, consuming balanced meals, engaging in light physical activity, and implementing stress management strategies. This suggests that digital health literacy contributes to practical health behavior change, particularly when information is perceived as relevant and easy to implement.

The application of health information reflects Nutbeam's interactive health literacy level, where individuals actively use information to improve their quality of life. Previous studies have similarly found that higher levels of digital health literacy are associated with better self-care behaviors and health autonomy among university students (Osborne et al., 2013; WHO, 2020). However, inconsistent application was observed in behaviors requiring sustained discipline, such as regular exercise and mental health help-seeking, indicating that structural and motivational factors also play a role.

Interrelationship Between Digital Health Literacy Dimensions and Healthy Lifestyle Behaviors

Overall, the findings suggest that digital health literacy among migrant students functions as a progressive process, beginning with access and culminating in application. Students with stronger abilities in accessing and understanding information were more likely to engage in healthy behaviors, while weaknesses in appraisal limited the consistency and quality of health-related decisions. This pattern reinforces the multidimensional nature of health literacy proposed by Nutbeam (2000) and highlights that improvements in one dimension do not automatically translate into competence in others.

The results underscore the importance of strengthening appraisal and application skills through targeted health education interventions within higher education institutions. By enhancing students' critical evaluation abilities and supporting the practical translation of health information into daily routines, universities can play a pivotal role in promoting sustainable healthy lifestyles among migrant students living independently. The results demonstrate that while migrant students possess adequate access to and understanding of digital health information, limitations in appraisal skills may constrain the effective and consistent application of such information in daily health practices.

Conclusion

This study concludes that migrant university students living in boarding houses near campus generally demonstrate moderate to high levels of digital health literacy, which are reflected in their daily physical and mental health behaviors. Students show strong competence in accessing and understanding digital health information, particularly in using online platforms as initial sources for health related guidance. These abilities support independent health

management among students who live away from family supervision.

However, the findings also indicate that critical appraisal skills remain uneven. Although many students actively verify health information and demonstrate caution toward misleading or promotional content, a proportion of respondents still experience uncertainty in evaluating the credibility of digital health information, especially on social media platforms. This limitation may affect the consistency and quality of health related decision-making.

In terms of application, most students are able to translate health information into positive lifestyle practices, including maintaining personal hygiene, regulating diet and hydration, engaging in light physical activity, avoiding smoking and vaping, and adopting adaptive coping strategies for mental health. Nevertheless, behaviors requiring sustained self-regulation such as maintaining regular sleep patterns and seeking professional help for mental health concerns remain influenced by contextual and psychological barriers.

Overall, the study highlights digital health literacy as a multidimensional competence that plays a critical role in shaping healthy lifestyles among migrant students. Strengthening appraisal and application skills through targeted digital health education and campus-based health promotion programs is essential to support sustainable health behaviors and enhance students' well being in the digital era.

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