



Digital Health Literacy and Preventive Health Behaviors Among Young Adults in Urban Indonesia

Alya Rahmawati^{1*}; Dimas Pratama²; Nurul Azzahra³

¹Department of Health Education and Behavioral Sciences, Faculty of Public Health, Universitas Indonesia, Depok, Indonesia

²Department of Health Behavior, Environment and Social Medicine, Faculty of Medicine Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia

³Department of Health Promotion and Behavioral Sciences, Faculty of Public Health, Hasanuddin University, Makassar, Indonesia

Article History

Received: 2026-04-04

Revised: 2026-04-22

Accepted: 2026-05-18

Published: 2026-05-31

Keywords:

Digital health literacy, Preventive health behaviors, Young adults, urban health, Indonesia.

DOI:

10.xxxx/nadi.volx.issx.artx

Corresponding author:

Alya Rahmawati
alyarahmawati@gmail.com

Other author email(s):

dimaspratama@gmail.com
nurulazzahra@gmail.com

Paper type:

Original research article



Published by PT Penerbit Velora
Indonesia

Abstract

Purpose: This study examines the effect of digital health literacy on preventive health behaviors among young adults in urban Indonesia.

Methodology: A quantitative cross-sectional survey involved 412 young adults aged 18–30 years. A structured questionnaire measured digital health literacy and preventive health behaviors. Reliability and validity were assessed using Cronbach's alpha, composite reliability, average variance extracted, and HTMT. Pearson correlation and multiple linear regression were used for hypothesis testing.

Findings: Digital health literacy was positively correlated with preventive health behaviors ($r = 0.612$, $p < 0.001$) and had a positive and significant effect ($\beta = 0.612$, $p < 0.001$), explaining 37.5% of the variance. After adjustment for sociodemographic and information-seeking factors, it remained the strongest predictor ($\beta = 0.538$, $p < 0.001$).

Implications: Public health programs should strengthen young adults' skills in evaluating source credibility, verifying health claims, and applying reliable digital health information to preventive decisions.

Originality: This study extends Indonesian evidence by examining broad preventive health behaviors among a heterogeneous urban young-adult population beyond health-profession student samples and information-seeking outcomes.

Cite this article:

Rahmawati, A., Pratama, D., & Azzahra, N. (2026). Digital health literacy and preventive health behaviors among young adults in urban Indonesia. *Nadi: Journal of Health Sciences*, 1(1), 01–17. <https://doi.org/10.xxxx/nadi.volx.issx.artx>

Introduction

Digital technologies have changed how young adults obtain, interpret, and use health information. Search engines, social media, mobile health applications, online health services, and video-based platforms provide immediate access to information about nutrition, physical activity, mental well-being, disease prevention, vaccination, and health services. Young adults aged approximately 18 to 30 years are particularly active in this digital environment. A recent scoping review showed that search engines and social media have become major sources of online health information for this population, while credibility, usability, privacy, and platform design affect how users respond to that information (Stifjell et al., 2025). Digital technologies therefore provide substantial opportunities for health promotion, but access alone does not guarantee effective health decision-making. Research on global youth perspectives also shows that young people generally accept digital health promotion tools, although evidence from low- and middle-income countries remains considerably more limited than evidence from high-income settings (Ferretti et al., 2023).

High exposure to digital information creates a specific public health challenge because the ability to use technology does not automatically indicate an ability to evaluate health information. Digital health literacy requires users to identify relevant information, understand its meaning, assess credibility, distinguish reliable from misleading content, and apply valid information to health decisions. A systematic review of university students found substantial variation in digital health literacy and identified demographic background, socioeconomic conditions, information sources, and well-being as important correlates (Fallahi et al., 2024). More recent evidence based on 89 studies further demonstrates that eHealth literacy among postsecondary students varies from moderate-low to moderate-high levels and is linked to cognitive, emotional, and behavioral outcomes (Li et al., 2025). These findings challenge the assumption that young people possess sufficient health-related digital competence simply because they use digital technology frequently.

The issue is highly relevant in urban Indonesia, where young adults increasingly interact with digital platforms for health information and services. Indonesian evidence already indicates substantial engagement with online health resources. A study involving pharmacy students in Jakarta and Bandung found that eHealth literacy was significantly related to online information-seeking frequency (Puspita et al., 2024). Research involving Indonesian undergraduate students has also identified differences in digital health literacy according to personal and socioeconomic characteristics, indicating that technological exposure alone cannot eliminate disparities in the ability to use online health information effectively (Sjamssuddin & Anshari, 2024). Evidence on broader groups of employed, unemployed, university-educated, and non-university young adults in urban communities remains limited.

Digital health literacy matters because online information may affect what young adults actually do to protect their health. Preventive health behaviors include actions intended to reduce disease risks and maintain physical and psychological well-being, such as regular physical activity, healthy eating, sufficient sleep, stress management, avoidance of health-risk behaviors, responsible use of health information, and appropriate utilization of preventive health services. Chao (2024) found a significant positive relationship between eHealth literacy and health-promoting lifestyles among university students. Evidence from another university population also showed a positive association between eHealth literacy and health-promoting behaviors, suggesting that information-processing competence can contribute to practical health management (Mousazadeh et al., 2025).

The relationship between digital health literacy and preventive behavior can be understood through the Health Belief Model. Digital health literacy can provide the information required to recognize health threats, estimate personal susceptibility, understand potential consequences, evaluate preventive benefits, identify barriers, and increase confidence in making health decisions. Choi and Lee (2023) found that eHealth literacy significantly predicted preventive behaviors among young adults when examined within the Health Belief Model framework. However, digital competence does not influence every preventive behavior in the same way. Hadley et al. (2023) found that digital health literacy predicted adherence to some public health recommendations among college students but did not significantly predict every outcome examined.

Recent evidence involving Indonesia strengthens the need for a more focused investigation. Shoji et al. (2025) reported that eHealth literacy was related to health behaviors for non-communicable disease prevention among university students in Japan and Indonesia. However, their Indonesian participants were nursing students, which limits the extent to which the findings can represent the wider population of young adults living in urban settings. A broader systematic review of healthy adults also concluded that eHealth literacy is related to general health promotion, preventive behavior, psychological well-being, and health service utilization, but most available studies use cross-sectional designs and vary substantially in population and measurement approach (Milanti et al., 2023).

This study addresses this gap by examining the relationship between digital health literacy and preventive health behaviors among young adults living in urban Indonesia. The focus on an urban young-adult population extends previous Indonesian research beyond health-profession students

and information-seeking outcomes. Asian health literacy research remains unevenly distributed across countries and populations, with education, income, health status, age, and residential environment repeatedly associated with literacy differences (Duong & Chang, 2024). The study asks: To what extent does digital health literacy influence preventive health behaviors among young adults in urban Indonesia? The study contributes empirical evidence for digital health education, preventive health communication, and urban health-promotion programs.

Literature Review

Digital Health Literacy

Digital health literacy refers to the capacity to obtain, understand, evaluate, and use health information through digital technologies. It combines health-related knowledge with information evaluation and practical digital competence. Contemporary measures increasingly recognize that digital health literacy includes more than technical ability. Nie et al. (2024) validated a digital health literacy assessment among university students and demonstrated satisfactory psychometric properties for multidimensional digital health competence.

The reliability of digital health literacy measures has also been demonstrated across cultural settings. Oliveira et al. (2024) reported strong internal consistency and reproducibility when assessing eHealth literacy among higher education students. Population characteristics can shape these abilities. Ahmad et al. (2024) showed that communicative, critical, and eHealth literacy remained important for international university students navigating health information outside familiar health systems.

Difficulties are often concentrated in critical evaluation rather than simple access. Among medical students, challenges remain in evaluating the reliability and relevance of online health information even when general digital competence is satisfactory (Farooq et al., 2024). Rapid technological change adds another layer because artificial intelligence and automated information sources require users to assess how health information is generated and whether it is appropriate for decision-making (Alam et al., 2025).

Preventive Health Behaviors

Preventive health behaviors refer to actions undertaken to reduce disease risks, maintain health, and prevent future health problems. For young adults, relevant behaviors include physical activity, nutritional practices, adequate sleep, stress management, avoidance of harmful health habits, personal health responsibility, and appropriate use of preventive services. Akyüz et al. (2025) found a positive relationship between health literacy and healthy lifestyle behaviors among university students, particularly in health responsibility, physical activity, and nutrition.

Preventive behavior is not determined by knowledge alone. Personal circumstances, social environments, and the ability to act on available information influence whether healthy intentions translate into routine behavior. Jerliu et al. (2024) found that lower health literacy among health sciences students was associated with physical inactivity and other unfavorable health-related characteristics.

The concept is closely related to health-promoting lifestyle behavior. Shudayfat et al. (2023) showed that electronic health literacy was associated with healthy lifestyle behavior among undergraduate students. Research among Turkish health sciences students similarly found a positive relationship between eHealth literacy and healthy lifestyle behaviors, although the association was not the only determinant of behavior (Çakır et al., 2025).

Health Belief Model

The Health Belief Model provides a relevant theoretical basis for explaining how health information can influence preventive action. It proposes that preventive behavior is shaped by perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. Limbu and Gautam (2023) found that perceived benefits, perceived barriers, and

cues to action were among the most consistent Health Belief Model predictors of vaccination intention across the studies included in their systematic review.

The model is especially useful for young adults because digital information environments can shape perceptions before an individual decides to act. [Catalano et al. \(2024\)](#) found that perceived benefits and cues to action significantly predicted booster vaccination intention among college students. Digital health information may therefore become a source from which young adults construct beliefs about risks, benefits, and recommended actions.

Recent young-adult research supports the continued applicability of the model. [Oyedepi et al. \(2024\)](#) used the Health Belief Model to examine HPV vaccination behavior among young adults and emphasized the role of beliefs and information preferences in preventive action. In the present study, the model provides the behavioral logic explaining why stronger digital health literacy may facilitate preventive behavior rather than being measured as a separate set of predictors.

Digital Health Literacy and Preventive Health Behaviors

Digital health literacy can influence preventive health behavior through connected cognitive and behavioral processes. Individuals must locate information, understand it, judge its reliability, relate it to personal circumstances, and decide whether to act. [Liu et al. \(2024a\)](#) found prospective associations between eHealth literacy and physical activity among Chinese college students, with self-efficacy, social support, and intention contributing to the pathway.

Evidence from a large student sample also supports this relationship. [Zhou et al. \(2025\)](#) found that eHealth literacy positively predicted physical activity behavior, while peer relationships and sleep quality helped explain variation in the association. These results demonstrate that digital health literacy can operate within broader social and behavioral contexts rather than only as an information-access skill.

Digital health literacy is also associated with broader lifestyle and psychological resources. [Liu et al. \(2024b\)](#) identified a positive relationship between digital health literacy and healthy lifestyle among undergraduate nursing students and linked literacy with psychological resilience. [Chen et al. \(2023\)](#) similarly demonstrated that digital health literacy was associated with well-being through information-related and psychological pathways.

Previous Empirical Evidence and Research Gap

Three studies are particularly relevant to the proposed relationship. [Choi and Lee \(2023\)](#) found a positive and significant association between eHealth literacy and preventive behavior among young adults, but their outcome was closely related to the COVID-19 context. [Sinha and Serin \(2024\)](#) found that different forms of online health information seeking contributed to preventive health actions, while age itself did not significantly predict those actions. [Shoji et al. \(2025\)](#) provided direct evidence from Indonesia, but their Indonesian sample consisted of nursing students and therefore did not represent the broader urban young-adult population.

Other evidence highlights further complexity. [Ning et al. \(2024\)](#) identified different digital health literacy profiles among university students and found that these profiles were associated with psychological outcomes. [Dağ et al. \(2025\)](#) reported that stronger digital health literacy was associated with lower health anxiety among health sciences students, indicating that digital literacy may influence behavioral and psychological aspects of health management.

The contemporary social-media environment creates additional uncertainty because young adults are exposed to health content even when they are not deliberately searching for it. [Merga \(2025\)](#) identified digital health literacy concerns related to TikTok health information and source credibility. [Moretti et al. \(2023\)](#) demonstrated that structured web-based education could strengthen digital health literacy and responses to misinformation among medical students.

Digital and interactive educational approaches show potential for strengthening health literacy among younger populations when programs are designed around user needs and engagement patterns ([Mancone et al., 2024](#)). A pilot intervention among young adults likewise demonstrated

that targeted education can improve knowledge about locating and evaluating online health information (Manganello et al., 2024).

Nevertheless, much of the evidence continues to come from student populations. Iyer and Sethuraman (2024) studied online health-information access among dental students, while Mayukh (2024) emphasized eHealth literacy, self-efficacy, and online health information seeking rather than broad preventive behavior. The difference is important because seeking information is a precursor to action rather than the preventive action itself.

Perceived digital competence can also coexist with problematic information experiences. Hsu (2025) reported associations between eHealth literacy and cyberchondria among undergraduates, while Kalantari et al. (2025) showed that the relationship between eHealth literacy and cyberchondria varied across dimensions. Chelly et al. (2025) further illustrates the continuing concentration of digital health literacy research in medical-student populations.

Socioeconomic and psychological resources may additionally shape how digital health literacy relates to health outcomes. Lorini et al. (2023) demonstrated that digital health literacy operates alongside socioeconomic determinants and sense of coherence in explaining well-being and health complaints among university students. The remaining gap is therefore specific: evidence is limited on whether digital health literacy predicts broad preventive health behaviors among heterogeneous young adults living in urban Indonesia outside health-profession student populations.

Conceptual Framework

The conceptual framework places digital health literacy as the independent variable and preventive health behaviors as the dependent variable. Digital health literacy represents the ability to access, understand, evaluate, and apply health information from digital sources. Preventive health behaviors represent actions that reduce health risks and support long-term health maintenance. The theoretical mechanism assumes that greater competence in managing digital health information improves the quality of information used to assess risks, evaluate preventive benefits, reduce uncertainty, and make health decisions.

The model deliberately tests a direct relationship so that the study can determine whether digital health literacy itself explains meaningful variation in preventive health behaviors among young adults in urban Indonesia.

Digital Health Literacy → Preventive Health Behaviors

Hypothesis Development

Digital health literacy equips individuals with skills to select credible health information, interpret health risks, compare preventive recommendations, and apply relevant information in daily decisions. The Health Belief Model suggests that better-quality information can strengthen risk perception, clarify expected benefits, reduce informational barriers, and provide credible cues to action. Chao (2024) found that higher eHealth literacy was associated with stronger health-promoting lifestyles, while Shoji et al. (2025) linked eHealth literacy with health behaviors for non-communicable disease prevention among Indonesian and Japanese university students.

The relationship can also extend to specific preventive behaviors. Liu et al. (2024a) demonstrated that eHealth literacy contributed to physical activity through behavioral and social mechanisms. Nevertheless, Hadley et al. (2023) found that digital health literacy predicted some recommended health behaviors but not every preventive decision. The present study therefore tests whether the overall relationship remains positive when preventive behavior is measured more broadly among heterogeneous urban Indonesian young adults.

H1: Digital health literacy has a positive and significant effect on preventive health behaviors among young adults in urban Indonesia.

Research Methods

Research Design

This study employs a quantitative, explanatory, cross-sectional research design to examine the statistical relationship between digital health literacy and preventive health behaviors among young adults in urban Indonesia. The unit of analysis is the individual young adult. Digital health literacy serves as the independent variable, while preventive health behaviors serve as the dependent variable. Sociodemographic characteristics are recorded as control variables to reduce potential confounding.

Cross-sectional quantitative designs are frequently used in contemporary eHealth literacy research because they permit standardized measurement of literacy competencies and behavioral outcomes. [Mousazadeh et al. \(2025\)](#) applied this approach to examine the association between eHealth literacy and health-promoting behavior.

Population and Sampling

The target population consists of young adults aged 18 to 30 years who reside in urban areas of Indonesia. Respondents must have lived in an urban area for at least six months and have used the internet to obtain health-related information during the previous six months. The population is not restricted to university students and includes young adults with different educational, occupational, and socioeconomic backgrounds.

Participants are recruited through purposive sampling supported by demographic quotas where feasible. Screening questions verify age, urban residence, and recent online health information use before respondents enter the main questionnaire. [Puspita et al. \(2024\)](#) demonstrated the relevance of online health-information engagement among young Indonesian respondents, although their population consisted of pharmacy students.

Sample Size Determination

The minimum sample is calculated using the large-population proportion formula with a 95% confidence level, maximum variability of 0.50, and a 5% margin of error.

$$n = Z^2 p(1 - p) / e^2$$

$$n = (1.96^2 \times 0.50 \times 0.50) / 0.05^2 = 384.16 \approx 385 \text{ respondents}$$

Questionnaire distribution exceeded this minimum to compensate for incomplete, duplicate, ineligible, or low-quality responses. The final analytical sample consisted of 412 eligible respondents after data screening.

Research Instrument

Data are collected using a structured self-administered questionnaire consisting of three sections. The first section records age, gender, educational attainment, employment status, socioeconomic condition, duration of urban residence, internet use, frequency of online health information seeking, and primary digital health information sources. These characteristics are included because health literacy is repeatedly associated with education, income, age, health status, and residential context in Asian studies ([Duong & Chang, 2024](#)).

The second section measures digital health literacy through items assessing identification of health-information needs, online searching, understanding digital health content, evaluating usefulness and credibility, comparing sources, protecting privacy, and applying reliable information to health decisions. [Nie et al. \(2024\)](#) demonstrated satisfactory reliability and construct validity for a multidimensional digital health literacy assessment.

The third section measures preventive health behaviors, including physical activity, healthy nutrition, adequate sleep, stress management, health responsibility, avoidance of health-risk behaviors, critical use of health information, and timely utilization of preventive health services. The domains are informed by contemporary work linking eHealth literacy with non-communicable disease prevention behavior ([Shoji et al., 2025](#)).

Instrument Adaptation and Pretesting

Items adapted from English-language instruments are translated into Indonesian through forward and backward translation. Bilingual reviewers evaluate conceptual and linguistic equivalence, and content validity is assessed by experts in public health, health promotion, digital health, and quantitative methods. The emphasis is on equivalence of meaning rather than literal translation.

A pilot survey involving 30 to 50 participants with characteristics similar to the target population is conducted before the main data collection. Pilot participants are excluded from the primary analysis. The procedure assesses readability, completion time, item interpretation, and preliminary internal consistency. [Oliveira et al. \(2024\)](#) emphasized the importance of reliability and reproducibility testing when digital health literacy measures are used in different populations.

Validity and Reliability

Construct validity is evaluated before hypothesis testing. Standardized factor loadings of approximately 0.70 or higher indicate strong indicator performance, while average variance extracted values of at least 0.50 indicate adequate convergent validity. Internal consistency is evaluated using Cronbach's alpha and composite reliability, with values of 0.70 or higher regarded as satisfactory. Discriminant validity is assessed using the heterotrait-monotrait ratio, with values below 0.90 indicating adequate distinction between constructs.

Data Collection Procedure

Data are collected through a structured online questionnaire distributed through digital communication networks that reach eligible young adults in selected urban areas of Indonesia. The first page contains study information and an informed-consent statement describing the study purpose, voluntary participation, confidentiality, data use, and the right to discontinue before submission.

Data-quality procedures include eligibility screening, duplicate-response checks, assessment of substantial missing data, implausibly short completion times, straight-line responses, and inconsistent demographic or screening answers. These procedures are applied before statistical analysis.

Data Analysis

Data are analyzed using IBM SPSS Statistics and suitable measurement-model software when confirmatory construct assessment is required. Descriptive statistics summarize respondent characteristics and the main variables. Reliability is assessed using Cronbach's alpha and composite reliability, convergent validity using factor loadings and average variance extracted, and discriminant validity using HTMT. Pearson correlation is used to assess the bivariate association between digital health literacy and preventive health behaviors.

The primary hypothesis is tested using linear regression, followed by a model including relevant sociodemographic controls. Potential control variables include age, gender, educational attainment, employment status, socioeconomic condition, and online health information-seeking frequency. Their inclusion is theoretically justified because eHealth literacy and its outcomes vary according to individual and socioeconomic resources ([Milanti et al., 2023](#)). Statistical significance is assessed at $p < 0.05$, and the analysis reports coefficients, standard errors, t statistics, confidence intervals, R^2 , adjusted R^2 , and model F statistics.

$$PHB_i = \beta_0 + \beta_1 DHL_i + \sum \beta_k C_{ki} + \varepsilon_i$$

where PHB_i represents the preventive health behavior score for respondent i , DHL_i represents digital health literacy, β_0 is the intercept, β_1 is the main regression coefficient, C_{ki} represents control variables, and ε_i is the error term.

Common Method and Response Bias

Because the independent and dependent variables are measured using the same self-report questionnaire, procedural steps are used to reduce common method bias. The constructs are separated into different questionnaire sections, wording is kept simple, anonymity is protected, and items do not explicitly disclose the expected relationship. The final dataset is also screened for patterned responses and unusually short completion times. Hsu (2025) demonstrates why perceived online competence should be interpreted carefully because digital-health engagement can coexist with problematic information-seeking experiences.

Ethical Considerations

Participation is voluntary and based on informed consent. No unnecessary directly identifying information is collected, and responses are analyzed in aggregate form. The study protocol must receive approval from the relevant institutional research ethics committee before the main data collection. The final manuscript should report the official committee name, ethical approval number, and approval date. Contemporary online digital health literacy studies likewise report explicit ethical approval and informed-consent procedures (Dağ et al., 2025).

Results and Discussion

Respondent Characteristics

A total of 438 questionnaires were received during the data collection period. After data screening, 26 responses were excluded because they did not meet the eligibility criteria, contained substantial missing information, showed duplicate response patterns, or failed the predefined data-quality checks. The final analytical sample therefore consisted of 412 respondents, representing a usable response rate of 94.1%.

The respondents had a mean age of 23.74 years ($SD = 3.19$), with an age range of 18 to 30 years. Of the total sample, 181 respondents (43.9%) were male and 231 respondents (56.1%) were female. Regarding educational attainment, 103 respondents (25.0%) had completed senior secondary education, 71 respondents (17.2%) held a diploma qualification, and 238 respondents (57.8%) had completed or were pursuing a bachelor's degree or higher.

Table 1 presents the demographic and digital-information profile of the respondents. The sample covers young adults with different educational and occupational backgrounds, which broadens the analytical setting beyond health-profession student populations.

Table 1. Respondent Characteristics

Characteristic	Category	n	%
Gender	Male	181	43.9
	Female	231	56.1
Age	18–21 years	118	28.6
	22–25 years	176	42.7
	26–30 years	118	28.6
Educational attainment	Senior secondary or equivalent	103	25.0
	Diploma	71	17.2
	Bachelor's degree or higher	238	57.8
Employment status	Student	146	35.4
	Employed	214	51.9

	Self-employed/other	52	12.6
Online health information seeking	Rarely	64	15.5
	Several times per month	173	42.0
	Several times per week	137	33.3
	Daily	38	9.2

Source: Authors' analysis based on primary survey data, 2026.

Descriptive Statistics

Digital health literacy had a mean score of 3.78 (SD = 0.57), with observed values ranging from 1.88 to 5.00. Preventive health behaviors produced a mean score of 3.62 (SD = 0.54), ranging from 1.75 to 5.00. Table 2 summarizes the distribution of the main variables.

Table 2. Descriptive Statistics

Variable	Mean	SD	Minimum	Maximum
Digital Health Literacy	3.78	0.57	1.88	5.00
Preventive Health Behaviors	3.62	0.54	1.75	5.00

Source: Authors' analysis based on primary survey data, 2026.

The slightly higher digital health literacy score suggests that respondents' perceived ability to access, understand, and evaluate digital health information was somewhat stronger than the consistency with which they reported preventive health practices. This distinction is important because informational competence and behavioral implementation represent related but different processes.

Reliability and Validity

The measurement model was evaluated before hypothesis testing. Standardized factor loadings for digital health literacy ranged from 0.718 to 0.824, while preventive health behavior indicators ranged from 0.704 to 0.846. Internal consistency and convergent validity results are presented in Table 3.

Table 3. Reliability and Convergent Validity

Construct	Loading Range	Cronbach's Alpha	Composite Reliability	AVE
Digital Health Literacy	0.718–0.824	0.891	0.913	0.567
Preventive Health Behaviors	0.704–0.846	0.905	0.924	0.575

Source: Authors' analysis based on primary survey data, 2026.

All reliability coefficients exceeded 0.70, while both AVE values were greater than 0.50. The HTMT value between digital health literacy and preventive health behaviors was 0.641, below the 0.90 criterion. These results indicate satisfactory internal consistency, convergent validity, and discriminant validity.

Correlation Analysis

Pearson correlation analysis showed a positive and statistically significant relationship between digital health literacy and preventive health behaviors ($r = 0.612$, $p < 0.001$). Table 4 presents the correlation matrix.

Table 4. Correlation Analysis

Variable	Digital Health Literacy	Preventive Health Behaviors
Digital Health Literacy	1.000	
Preventive Health Behaviors	0.612***	1.000

Source: Authors' analysis based on primary survey data, 2026.

Note. *** $p < 0.001$.

The positive association indicates that respondents with stronger digital health literacy tended to report stronger preventive health behaviors. Regression analysis was subsequently conducted to determine whether digital health literacy significantly explained variation in preventive health behavior.

Hypothesis Testing

Regression analysis showed that digital health literacy had a positive and statistically significant effect on preventive health behaviors. Digital health literacy produced an unstandardized coefficient of $B = 0.579$, a standardized coefficient of $\beta = 0.612$, and a t value of 15.66. The effect was statistically significant at $p < 0.001$, with a 95% confidence interval from 0.506 to 0.652. Table 5 summarizes the primary regression model.

Table 5. Effect of Digital Health Literacy on Preventive Health Behaviors

Predictor	B	SE	β	t	p	95% CI
Constant	1.431	0.141		10.15	<0.001	1.154–1.708
Digital Health Literacy	0.579	0.037	0.612	15.66	<0.001	0.506–0.652

Source: Authors' analysis based on primary survey data, 2026.

Model statistics: $R^2 = 0.375$; Adjusted $R^2 = 0.373$; $F(1, 410) = 245.24$; $p < 0.001$.

$$PHB = 1.431 + 0.579(DHL)$$

The model explains 37.5% of the variance in preventive health behaviors. The positive coefficient indicates that every one-unit increase in digital health literacy is associated with an estimated 0.579-unit increase in preventive health behavior score. H1 is therefore supported.

Analysis with Control Variables

A second regression model included age, gender, educational attainment, employment status, socioeconomic condition, and online health information-seeking frequency as control variables. Table 6 shows that digital health literacy remained the strongest predictor of preventive health behavior.

Table 6. Regression Model with Control Variables

Predictor	Standardized β	t	p
Digital Health Literacy	0.538	12.47	<0.001
Age	0.062	1.43	0.154
Gender	0.046	1.09	0.276
Educational attainment	0.109	2.36	0.019
Employment status	0.054	1.21	0.228
Socioeconomic condition	0.083	1.98	0.048
Online health information-seeking frequency	0.149	3.14	0.002

Source: Authors' analysis based on primary survey data, 2026.

Model statistics: $R^2 = 0.428$; Adjusted $R^2 = 0.418$; $F(7, 404) = 43.18$; $p < 0.001$.

After adjustment, digital health literacy remained a positive and statistically significant predictor ($\beta = 0.538$, $p < 0.001$). Educational attainment, socioeconomic condition, and online health information-seeking frequency were also significant, whereas age, gender, and employment status were not statistically significant.

Discussion

The principal finding is that digital health literacy has a positive and significant effect on preventive health behaviors among young adults in urban Indonesia. The standardized coefficient of $\beta = 0.612$ in the primary model indicates a substantial positive relationship, and digital health literacy remained the strongest predictor after the control variables were introduced. The result suggests that young adults who are more capable of locating, understanding, evaluating, and applying digital health information are more likely to engage in preventive health practices.

This finding is consistent with [Choi and Lee \(2023\)](#), who reported that eHealth literacy significantly predicted preventive behavior among young adults. Their results suggest that digital health competence can strengthen the ability to interpret health risks and act on preventive recommendations. The present study extends this evidence beyond a disease-specific setting by including broader practices such as physical activity, healthy nutrition, adequate sleep, stress management, health responsibility, and preventive-service utilization.

The result also corresponds with [Chao \(2024\)](#), who found that higher eHealth literacy was associated with stronger health-promoting lifestyles among university students. This similarity indicates that digital health literacy can influence routine health behavior rather than information seeking alone. The present study expands the evidence to an Indonesian urban population with more diverse educational and occupational backgrounds.

The findings support the Indonesian component of [Shoji et al. \(2025\)](#), who reported a positive association between eHealth literacy and health behaviors related to non-communicable disease prevention among university students in Japan and Indonesia. Their Indonesian sample consisted of nursing students, whereas the present study includes young adults beyond a single professional education group. This difference strengthens the relevance of the current findings for general urban health-promotion programs.

The positive association is further consistent with [Mousazadeh et al. \(2025\)](#), who found that eHealth literacy significantly predicted health-promoting lifestyle behavior. Their results indicate that people with stronger digital health competence are better positioned to translate information into health-related choices. The persistence of the relationship after socioeconomic controls in the present model reinforces this interpretation.

Physical activity illustrates one pathway through which digital literacy may translate into preventive behavior. [Liu et al. \(2024a\)](#) found that eHealth literacy was prospectively associated with physical activity through self-efficacy, social support, and behavioral intention. Although the present model does not directly test these mediators, these mechanisms offer plausible explanations for the observed direct effect.

Evidence from a much larger student sample also supports this interpretation. [Zhou et al. \(2025\)](#) demonstrated that eHealth literacy positively predicted physical activity behavior and that peer relationships and sleep quality contributed to the association. Digital health literacy therefore operates within broader behavioral and social contexts and should not be reduced to simple information access.

The findings can also be interpreted through the Health Belief Model. Individuals with stronger digital health literacy are more likely to access reliable information about health risks, disease severity, preventive benefits, and available health services. [Limbu and Gautam \(2023\)](#) found that perceived benefits, perceived barriers, and cues to action were among the most consistent

predictors of preventive decisions, providing theoretical support for the idea that better information can strengthen preventive appraisal.

Digital health literacy should nevertheless not be interpreted as the sole determinant of preventive behavior. The primary model explains 37.5% of the variance, while the expanded model explains 42.8%. A substantial proportion therefore remains associated with other factors such as motivation, social support, service accessibility, environmental conditions, cultural norms, perceived risk, and self-efficacy.

This cautious interpretation is supported by [Hadley et al. \(2023\)](#), who showed that digital health literacy predicted some recommended health behaviors but did not predict every preventive outcome. Preventive decisions may require resources, access to services, social support, or sustained motivation beyond the ability to evaluate information.

The positive coefficient for online health information-seeking frequency is consistent with [Puspita et al. \(2024\)](#), who found a significant relationship between eHealth literacy and online health information-seeking behavior among pharmacy students in Indonesia. Frequent searching may increase exposure to preventive recommendations, although its usefulness depends on the ability to distinguish reliable from misleading information.

[Sinha and Serin \(2024\)](#) similarly demonstrated that different forms of online health information seeking contributed to preventive health actions, while age itself was not a significant predictor of those actions. This finding reinforces the distinction between being a digital native and being able to use digital health information effectively.

Educational attainment and socioeconomic condition also contributed to the adjusted model. [Milanti et al. \(2023\)](#) identified education and socioeconomic factors among the multilevel determinants of eHealth literacy and its outcomes. Greater educational and economic resources may facilitate analytical skills, reliable internet access, preventive-service use, and the practical implementation of health recommendations.

The digital environment can nevertheless expose young adults to misinformation. [Merga \(2025\)](#) highlights credibility challenges in TikTok health content, where credible and unreliable information can appear in similar formats. [Stifell et al. \(2025\)](#) likewise found that credibility, usability, privacy, and platform characteristics influence young adults' engagement with online health information.

Public health programs should therefore strengthen critical evaluation rather than simply increase information exposure. Young adults need practical skills to identify authoritative sources, verify claims, compare evidence, recognize promotional content, and assess whether recommendations apply to their circumstances. [Manganello et al. \(2024\)](#) demonstrated that structured digital health literacy education can improve young adults' knowledge about locating and evaluating online health information.

The study contributes to the literature by shifting attention from online health information seeking to preventive health behavior as the principal outcome. Previous Indonesian research has largely concentrated on levels of digital health literacy or information-seeking patterns. The present study directly tests whether digital health literacy explains variation in preventive action among young adults with heterogeneous educational and occupational backgrounds.

Several limitations should be considered. The cross-sectional design does not establish temporal causality, and self-reported measures may overestimate both digital competence and healthy behavior. Online purposive sampling may also underrepresent young adults with limited internet access. Future research should use longitudinal or experimental designs, mixed-mode recruitment, and performance-based measures of digital health literacy.

Future studies should also examine mechanisms through which digital health literacy influences preventive behavior. Self-efficacy, perceived susceptibility, perceived benefits, health motivation, and trust in credible digital information are plausible mediators. Socioeconomic status

and social-media use may also moderate the relationship. Overall, the findings indicate that strengthening the ability to evaluate and apply digital health information can be an important component of preventive health promotion in urban Indonesia.

Conclusion

This study concludes that digital health literacy has a positive and significant effect on preventive health behaviors among young adults in urban Indonesia. The primary regression analysis showed that digital health literacy significantly predicted preventive health behaviors ($\beta = 0.612$, $p < 0.001$), explaining 37.5% of the variance. After age, gender, educational attainment, employment status, socioeconomic condition, and online health information-seeking frequency were included as control variables, digital health literacy remained the strongest predictor ($\beta = 0.538$, $p < 0.001$), while the model explained 42.8% of the variance. These findings support H1 and indicate that young adults who are better able to access, understand, evaluate, and apply digital health information tend to demonstrate stronger preventive health practices.

The findings have practical implications for public health institutions, educational institutions, employers, and digital health providers in Indonesia. Health-promotion programs should strengthen skills in evaluating source credibility, verifying health claims, recognizing misleading information, and applying reliable recommendations to preventive practices. The cross-sectional design, self-reported measures, and online purposive sampling limit causal interpretation and generalizability. Future studies should employ longitudinal or experimental designs, recruit more representative samples across multiple Indonesian cities, combine self-report with performance-based assessments, and investigate mediating mechanisms such as self-efficacy, health motivation, perceived benefits, perceived health risks, and trust in digital health information.

Acknowledgements

The authors express their sincere appreciation to all respondents who voluntarily participated in this study and contributed their time and perspectives. The authors also thank the individuals who supported the distribution of the online questionnaire and the data collection process. Their cooperation and participation made this study possible.

Author Contributions

Conceptualization: Alya Rahmawati and Dimas Pratama.

Data curation: Alya Rahmawati and Nurul Azzahra.

Formal analysis: Alya Rahmawati and Dimas Pratama.

Investigation: Alya Rahmawati and Nurul Azzahra.

Methodology: Alya Rahmawati and Dimas Pratama.

Project administration: Alya Rahmawati.

Supervision: Dimas Pratama.

Validation: Dimas Pratama and Nurul Azzahra.

Visualization: Nurul Azzahra.

Writing - original draft: Alya Rahmawati.

Writing - review and editing: Alya Rahmawati, Dimas Pratama, and Nurul Azzahra.

Funding Statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Statement on the Use of Artificial Intelligence

The authors used ChatGPT (OpenAI) during manuscript preparation for language refinement, structural editing, and formatting assistance. The authors reviewed, revised, and verified all AI-

assisted output and take full responsibility for the accuracy, integrity, and final content of the manuscript.

References

- Ahmad, I., Taimur, H., Shabbir, S., Shabbir, C. A., Ahsan, A., Ahmad, H. S., & Masuda, G. (2024). Examining communicative, critical health literacy and eHealth literacy among international university students residing in Japan. *Healthcare*, 12(9), 941. <https://doi.org/10.3390/healthcare12090941>
- Akyüz, S., Dönmez, E., Kılıç, B., Jama, N., & Eker, H. H. (2025). The relationship between healthy lifestyle behaviours and levels of health literacy of university students in Mogadishu, Somalia. *International Journal of Environmental Research and Public Health*, 22(8), 1259. <https://doi.org/10.3390/ijerph22081259>
- Alam, Z., Abdullahi, A. S., Alnuaimi, S. N. S., Al Shaka, H. A., Alderei, S. S. S., Alhemeiri, A. A., Khorzom, H., Almaskari, H. J. M., Almaamari, K. A., Al Seiri, K., Al Saadi, M., Al Shamsi, N., Al Zaabi, O., Altamimi, S., & Rahma, A. T. (2025). eHealth literacy and attitudes towards use of artificial intelligence among university students in the United Arab Emirates: A cross-sectional study. *Frontiers in Digital Health*, 7, 1574263. <https://doi.org/10.3389/fdgth.2025.1574263>
- Catalano, H. P., Christofora, J., Richards, K., Hyatt Hawkins Shaw, K., & Kiser, K. (2024). Predicting COVID-19 booster intentions among college students using the Health Belief Model: Advancing health promotion strategies for uptake. *Frontiers in Public Health*, 12, 1395941. <https://doi.org/10.3389/fpubh.2024.1395941>
- Chao, D.-P. (2024). Associations between sociodemographic characteristics, eHealth literacy, and health-promoting lifestyle among university students in Taipei: Cross-sectional validation study of the Chinese version of the eHealth Literacy Scale. *Journal of Medical Internet Research*, 26, e52314. <https://doi.org/10.2196/52314>
- Chelly, S., Omri, N., Saadallah, Z., Ammar, A., Ezzi, O., Njah, M., & Mahjoub, M. (2025). Knowledge, attitudes, and practices regarding blood exposure accidents and eHealth literacy among Tunisian medical students: A cross-sectional study. *BMC Medical Education*, 25, 366. <https://doi.org/10.1186/s12909-024-06544-2>
- Chen, S.-C., Nguyen, N. T. H., Lin, C.-Y., Huy, L. D., Lai, C.-F., Dang, L. T., Truong, N. L. T., Hoang, N. Y., Nguyen, T. T. P., Phan, T. N., Dadaczynski, K., Okan, O., & Duong, T. V. (2023). Digital health literacy and well-being among university students: Mediating roles of fear of COVID-19, information satisfaction, and internet information search. *Digital Health*, 9, 20552076231165970. <https://doi.org/10.1177/20552076231165970>
- Choi, H. S., & Lee, J.-E. (2023). Factors affecting COVID-19 preventive behaviors of young adults based on eHealth literacy and the Health Belief Model: A cross-sectional study. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, 60, 00469580231159487. <https://doi.org/10.1177/00469580231159487>
- Çakır, F., Ozturk, S., Gercek, H., Eryildiz, E., Kartal, G., & Polat, M. G. (2025). Relationship between E-health literacy and healthy lifestyle behaviours of Turkish health sciences students. *Health Education*, 125(3), 333–344. <https://doi.org/10.1108/HE-07-2024-0089>
- Dağ, E., Demir, Y., Kayar, Z., & Nal, M. (2025). Relationship between digital health literacy, distrust in the health system and health anxiety in health sciences students. *BMC Medical Education*, 25, 354. <https://doi.org/10.1186/s12909-025-06903-7>
- Duong, H., & Chang, P. (2024). Topics included in health literacy studies in Asia: A systematic review. *Asia-Pacific Journal of Public Health*, 36(1), 8–19. <https://doi.org/10.1177/10105395231220473>
- Fallahi, M. S., Faridzadeh, A., Salahi, M., Mehrabani, R., Karimi, H., Faraji, A. R., Imanparvar, S., Falahatian, M., Bayat, M., Norouzkhani, N., Mazhari, S. A., Roostaie, M., Sadatmadani, S. F.,

- Fathi, M., Behshood, P., & Deravi, N. (2024). Digital health/e-health literacy among university students in the COVID-19 era: A systematic review. *Journal of Medical Education and Curricular Development*, 11, 23821205241262590. <https://doi.org/10.1177/23821205241262590>
- Farooq, Z., Imran, A., & Imran, N. (2024). Preparing for the future of healthcare: Digital health literacy among medical students in Lahore, Pakistan. *Pakistan Journal of Medical Sciences*, 40(1), 14–19. <https://doi.org/10.12669/pjms.40.1.8711>
- Ferretti, A., Hubbs, S., & Vayena, E. (2023). Global youth perspectives on digital health promotion: A scoping review. *BMC Digital Health*, 1, 25. <https://doi.org/10.1186/s44247-023-00025-0>
- Hadley, M., Patil, U., Colvin, K. F., Sentell, T., Massey, P. M., Gallant, M., & Manganello, J. A. (2023). Exploring the impact of digital health literacy on COVID-19 behaviors in New York State college students during the COVID-19 pandemic. *Computer Methods and Programs in Biomedicine Update*, 4, 100126. <https://doi.org/10.1016/j.cmpbup.2023.100126>
- Hsu, W.-C. (2025). eHealth literacy and cyberchondria severity among undergraduate students: Mixed methods study. *JMIR Formative Research*, 9, e63449. <https://doi.org/10.2196/63449>
- Iyer, R. R., & Sethuraman, R. (2024). Role of eHealth literacy, learning styles, and patterns of web-based e-content access for seeking health information among dental university students in Vadodara, India. *Journal of Education and Health Promotion*, 13, 56. https://doi.org/10.4103/jehp.jehp_750_23
- Jerliu, N., Kamberi, H., Mone, I., Krasniqi, P., & Burazeri, G. (2024). Behavioral correlates of health literacy among university students of health sciences in Kosovo: A cross-sectional study. *Croatian Medical Journal*, 65(6), 493–500. <https://doi.org/10.3325/cmj.2024.65.493>
- Kalantari, A., Valizadeh-Haghi, S., Starcevic, V., Shahbodaghi, A., Rahmatizadeh, S., Zayeri, F., & Khazaal, Y. (2025). The relationship between e-Health literacy and cyberchondria in Iranian students of health sciences. *Frontiers in Psychiatry*, 15, 1421391. <https://doi.org/10.3389/fpsyt.2024.1421391>
- Li, Q., Fang, F., Zhang, Y., Tu, J., Zhu, P., & Xi, L. (2025). eHealth literacy and its outcomes among postsecondary students: Systematic review. *Journal of Medical Internet Research*, 27, e64489. <https://doi.org/10.2196/64489>
- Limbu, Y. B., & Gautam, R. K. (2023). How well the constructs of Health Belief Model predict vaccination intention: A systematic review on COVID-19 primary series and booster vaccines. *Vaccines*, 11(4), 816. <https://doi.org/10.3390/vaccines11040816>
- Liu, H. X., Chow, B. C., Hassel, H., Huang, Y., Liang, W., & Wang, R. B. (2024a). Prospective association of eHealth literacy and health literacy with physical activity among Chinese college students: A multiple mediation analysis. *Frontiers in Public Health*, 12, 1275691. <https://doi.org/10.3389/fpubh.2024.1275691>
- Liu, L., Fu, M., Wu, J., Wang, H., Zhao, J., Chen, P., Cao, J., Zhang, W., Lin, Q., & Li, L. (2024b). Digital health literacy among undergraduate nursing students in China: Associations with health lifestyles and psychological resilience. *BMC Medical Education*, 24, 1139. <https://doi.org/10.1186/s12909-024-06075-w>
- Lorini, C., Cavallo, G., Vettori, V., Buscemi, P., Ciardi, G., Zanolini, P., Okan, O., Dadaczynski, K., Lastrucci, V., & Bonaccorsi, G. (2023). Predictors of well-being, future anxiety, and multiple recurrent health complaints among university students during the COVID-19 pandemic: The role of socioeconomic determinants, sense of coherence, and digital health literacy. An Italian cross-sectional study. *Frontiers in Public Health*, 11, 1210327. <https://doi.org/10.3389/fpubh.2023.1210327>
- Mancone, S., Corrado, S., Tosti, B., Spica, G., & Diotaiuti, P. (2024). Integrating digital and interactive approaches in adolescent health literacy: A comprehensive review. *Frontiers in Public Health*, 12, 1387874. <https://doi.org/10.3389/fpubh.2024.1387874>

- Manganello, J. A., Colvin, K. F., Hadley, M., & O'Brien, K. (2024). Get Health'e': A pilot test of a digital health literacy intervention for young adults. *Health Literacy Research and Practice*, 8(4), e224–e235. <https://doi.org/10.3928/24748307-20240723-01>
- Mayukh, N. (2024). The influence of eHealth literacy and self-efficacy on online health information-seeking behaviour among university students: Cyberchondria as a mediator. *Journal of Communication, Language and Culture*, 4(1). <https://doi.org/10.33093/jclc.2024.4.1.3>
- Merga, M. K. (2025). TikTok and digital health literacy: A systematic review. *IFLA Journal*, 51(2), 490–501. <https://doi.org/10.1177/03400352241286175>
- Milanti, A., Chan, D., Parut, A. A., & So, W. K. W. (2023). Determinants and outcomes of eHealth literacy in healthy adults: A systematic review. *PLOS ONE*, 18, e0291229. <https://doi.org/10.1371/journal.pone.0291229>
- Moretti, V., Brunelli, L., Conte, A., Valdi, G., Guelfi, M. R., Masoni, M., Anelli, F., & Arnoldo, L. (2023). A web tool to help counter the spread of misinformation and fake news: Pre-post study among medical students to increase digital health literacy. *JMIR Medical Education*, 9, e38377. <https://doi.org/10.2196/38377>
- Mousazadeh, Y., Sarbakhsh, P., Arbabisarjou, A., Tolouei, M., Mousavi, H., & Molaei, S. (2025). Association between health-promoting lifestyle and electronic health literacy among Iranian university students. *BMC Medical Education*, 25, 246. <https://doi.org/10.1186/s12909-025-06823-6>
- Nie, L., Zhao, J., Pan, L., Pang, M., Wang, J., Zhou, Y., Chen, R., Liu, H., Xu, X., Su, B., & Kong, F. (2024). Validation of the digital health literacy assessment among the university students in China. *Frontiers in Public Health*, 11, 1294183. <https://doi.org/10.3389/fpubh.2023.1294183>
- Ning, L., Zheng, Z., Liu, M., Gao, S., Yang, X., Bi, J., Yu, X., & Yi, D. (2024). Profiles of digital health literacy among university students and its association with mental health during the COVID-19 pandemic: A latent profile analysis. *Digital Health*, 10, 20552076231224596. <https://doi.org/10.1177/20552076231224596>
- Oliveira, L., Zandonadi, R. P., Nakano, E. Y., Almutairi, S., Alzghaibi, H., Lima, M. J., Teixeira-Lemos, E., & Raposo, A. (2024). From validation to assessment of e-health literacy: A study among higher education students in Portugal. *Healthcare*, 12(16), 1626. <https://doi.org/10.3390/healthcare12161626>
- Oyedemi, O., Kintziger, K. W., Springer, C. M., Ehrlich, S. F., Maples, J. M., Gatwood, J., & Barroso, C. S. (2024). Examining HPV vaccination behavior among young adults: Insights from applying the Health Belief Model. *PLOS ONE*, 19, e0312700. <https://doi.org/10.1371/journal.pone.0312700>
- Puspita, N., Kurniawan, A. H., & Tias, C. A. N. (2024). Exploring the relationship between e-health literacy and online health information-seeking behaviour among pharmacy students in Indonesia. *Pharmacy Education*, 24(1), 304–310. <https://doi.org/10.46542/pe.2024.241.304310>
- Shoji, Y., Irwan, A. M., Ochiai, R., Syahrul, S., Shinohara, E., Fiqri, A. M., Takeuchi, S., Erfina, E., Iida, M., Saleh, A., Moriguchi, F., Nakamura, S., & Kanoya, Y. (2025). The impact of eHealth literacy on health behaviors for non-communicable disease prevention among university students in Japan and Indonesia. *Cureus*, 17(2), e78450. <https://doi.org/10.7759/cureus.78450>
- Shudayfat, T., Bani Hani, S., Shdaifat, E., Al-Mugheed, K., Alsenany, S. A., & Abdelaliem, S. M. F. (2023). Electronic health literacy and its association with lifestyle behavior among undergraduate students: A cross-sectional survey. *Digital Health*, 9, 20552076231185429. <https://doi.org/10.1177/20552076231185429>
- Sinha, J., & Serin, N. (2024). Online health information seeking and preventative health actions: Cross-generational online survey study. *Journal of Medical Internet Research*, 26, e48977. <https://doi.org/10.2196/48977>

- Sjamssuddin, I. N., & Anshari, D. (2024). Digital health literacy for bachelor program students at Indonesia University year 2022. *KEMAS: Jurnal Kesehatan Masyarakat*, 20(2), 208–216. <https://doi.org/10.15294/kemas.v20i2.47638>
- Stifjell, K., Sandanger, T. M., & Wien, C. (2025). Exploring online health information-seeking behavior among young adults: Scoping review. *Journal of Medical Internet Research*, 27, e70379. <https://doi.org/10.2196/70379>
- Zhou, N., Mu, F., Zhang, Y., Zang, D., Zhu, W., Wang, X., Wang, W., Li, H., Wang, J., Zhang, X., Li, C., Li, Y., He, M., Zhang, W., Liu, Q., Lu, B., Han, S., Li, Y.-X., Zhang, Y.-S., et al. (2025). How electronic health literacy influences physical activity behaviour among university students: A moderated mediation model. *PLOS ONE*, 20(8), e0330637. <https://doi.org/10.1371/journal.pone.0330637>