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DIGITAL REPRODUCTIVE HEALTH LITERACY AND REPRODUCTIVE HEALTH BEHAVIOR AMONG FEMALE STUDENTS AT THE FACULTY OF HEALTH SCIENCES, BINA BANGSA UNIVERSITY

Ade Rahayu Prihartini[*1], Maesaroh[2], Pearly Otis Putri Oktaviani[3]
[1,2]Bina Bangsa University
[3]Sekolah Tinggi Ilmu Kesehatan Cirebon
Corresponding Email: nenkdiva@gmail.com*

ABSTRACT

Digital media are major sources of reproductive health information for university students, but online information varies in accuracy. This study examined the relationship between digital reproductive health literacy and reproductive health behavior among female students at the Faculty of Health Sciences, Bina Bangsa University. A cross-sectional correlational design involved 95 first-year female students selected using proportionate stratified random sampling. Digital reproductive health literacy and reproductive health behavior were measured using structured online questionnaires. Because the distributions were non-normal, the association was analyzed using Spearman's rank correlation. Most participants had high digital reproductive health literacy (44.2%), and 42.1% demonstrated good reproductive health behavior. Digital reproductive health literacy was strongly and positively correlated with reproductive health behavior (rho = 0.740; $p < 0.001$). These findings indicate that students who were better able to access, understand, evaluate, and apply online reproductive health information tended to report healthier reproductive health practices. The study adds context-specific evidence from Indonesian health-science students by linking critical digital information skills with multidimensional reproductive self-care behavior. However, its cross-sectional and self-reported design does not establish causality. Universities should integrate source evaluation, misinformation recognition, and practical reproductive self-care into digital health education, while longitudinal and multi-institutional studies are needed to confirm the relationship.

Keywords

Digital Health Literacy, Reproductive Health Behavior, Female Students, Reproductive Health, Adolescents

INTRODUCTION

Reproductive health behavior among female university students remains an important concern in public health, particularly during late adolescence and early adulthood. At this stage, young women

experience physical, psychological, and social changes that may influence the way they maintain their reproductive health. Good reproductive health behavior includes maintaining menstrual hygiene, practicing genital hygiene, adopting healthy lifestyles, and performing appropriate self-care during menstruation. These practices are essential to prevent reproductive health problems and improve women's overall quality of life. However, many young women still demonstrate inadequate reproductive health practices due to limited knowledge, misinformation, and low health literacy. According to the World Health Organization, reproductive health problems among adolescents and young adults are still associated with poor hygiene practices, unhealthy lifestyles, and limited access to accurate health information (World Health Organisation, 2022). In Indonesia, reproductive health issues among adolescents and university students include inadequate menstrual hygiene management, anemia, reproductive tract infections, and misconceptions regarding reproductive health (Kemenkes, 2023).

Digital technology has transformed how university students obtain reproductive health information. Social media, search engines, video platforms, and online communities provide rapid access but also expose users to commercial content, misinformation, and advice without clinical context. Consequently, access alone is insufficient; students require skills to judge source credibility, distinguish evidence from opinion, and translate reliable information into safe reproductive health practices. Recent studies confirm that digital health literacy among university students is multidimensional and varies substantially within apparently technology-proficient populations (Nie et al., 2023; Ning et al., 2024).

Digital reproductive health literacy refers to an individual's ability to search for, access, understand, evaluate, and appropriately use reproductive health information from digital sources. Good digital health literacy helps individuals identify credible information, make appropriate health decisions, and apply healthier reproductive health practices in daily life. In contrast, limited digital health literacy may increase the risk of misunderstanding reproductive health information, inappropriate self-care behavior, and poor reproductive health practices among young women (Bujnowska-Fedak & Węgierek, 2020). Ban et al., (2024) explained that digital health literacy has become an essential competency in the digital era because individuals are increasingly dependent on online platforms and social media as primary sources of health information.

Recent evidence associates stronger digital health literacy with better information satisfaction, well-being, and health-promotion behavior among university students (Chen et al., 2023; Yang, 2024). In the reproductive health domain, a systematic review found that health literacy is relevant to fertility awareness, sexual health knowledge, service navigation, and reproductive decision-making, while also identifying substantial variation in instruments and populations (Prémusz et al., 2025). These findings support examination of digital literacy as a behavioral resource rather than treating internet exposure or reproductive health knowledge as equivalent constructs.

Meanwhile, Amelia, (2020) found that social media may positively influence women's reproductive health awareness by improving access to health information. Research conducted by Cahyani & Sari, (2025) further explained that social media can be an effective platform for reproductive

health promotion among adolescents because digital-based education is considered more interactive and easier to access.

Despite growing digital media use, evidence linking digital reproductive health literacy with multidimensional reproductive health behavior among Indonesian female university students remains limited. Earlier studies frequently examined general eHealth literacy, menstrual hygiene, reproductive knowledge, or social-media exposure separately. Few studies have tested whether critical abilities to access, understand, evaluate, and apply digital reproductive health information are associated with a broader set of behaviors that includes menstrual hygiene, genital hygiene, healthy lifestyle practices, and reproductive self-care.

The novelty of this study lies in integrating a reproductive-health-specific digital literacy construct with a multidimensional behavioral outcome in first-year female health-science students. This population is academically exposed to health information but is also transitioning from adolescence to independent health decision-making, making it inappropriate to assume that health-related enrollment automatically ensures critical digital literacy or consistent behavior. The study therefore aimed to examine the direction and strength of the relationship between digital reproductive health literacy and reproductive health behavior. Its contribution is context-specific evidence for designing university health promotion that combines credible-source appraisal with practical reproductive self-care skills.

METHOD

This study used a quantitative cross-sectional correlational design to examine the relationship between digital reproductive health literacy and reproductive health behavior. This design was appropriate for estimating the direction and strength of an association when both variables were measured at one time point. Because exposure and outcome were assessed simultaneously, temporal order and causality cannot be established.

The study was conducted at the Faculty of Health Sciences, Bina Bangsa University, from January to February 2026. The target population comprised all 548 first-year female students. First-year students were selected because they were transitioning from late adolescence to early adulthood, beginning more independent health decision-making, and entering a shared academic environment with substantial digital-media exposure. Restricting the population to one academic year improved contextual comparability but limits generalization to senior students, male students, and students outside health sciences.

The minimum sample was estimated from the finite population of 548 students using the Slovin formula with a 10% margin of error, yielding 84.5 and rounded to 85 participants. An additional 10% was included to anticipate incomplete responses, producing a target of 95. Proportionate stratified random sampling was used so that each study program contributed participants according to its share of the first-year female-student population. This approach reduced disproportionate representation across programs; however, the 10% precision level provides a relatively broad estimate and the study should be interpreted as institution-specific correlational evidence.

$$n = \frac{N}{1+N(e)^2}$$

$$= \frac{548}{1+548(0,1)^2}$$

$$= 84.5$$

Based on the calculation, the minimum sample size required was 85 respondents. To anticipate incomplete questionnaires or missing data, the researcher added approximately 10% to the minimum sample size, resulting in a total sample of 95 respondents. The sampling technique applied in this study was proportionate stratified random sampling to ensure proportional representation from each study program within the Faculty of Health Sciences (Dahlan, 2019; Sugiyono, 2018).

The independent variable was digital reproductive health literacy, operationalized as the ability to access, understand, evaluate, and apply reproductive health information from digital sources. The dependent variable was reproductive health behavior, covering menstrual hygiene, genital hygiene, healthy lifestyle practices, menstrual self-care, and reproductive health maintenance. Higher scores represented stronger literacy and healthier reported behavior. Category thresholds were applied according to the scoring procedure established for the study questionnaire; interpretation focused primarily on the continuous or ranked scores used in correlation analysis rather than category labels alone.

Data were collected through a structured online questionnaire distributed using Google Forms. The digital reproductive health literacy items were adapted from contemporary digital health literacy domains, including access, comprehension, evaluation of credibility, and application of online information (Ban et al., 2024; Nie et al., 2023). The reproductive health behavior items assessed menstrual hygiene, genital hygiene, healthy lifestyle habits, menstrual self-care, and reproductive health maintenance. This description replaces the inconsistent reference to eHEALS in the original abstract; the instrument used in this study was a context-adapted questionnaire rather than an unmodified eHEALS scale.

Before data collection, the adapted questionnaires were piloted among individuals with characteristics similar to the study population. Item validity was evaluated using Pearson product-moment item-total correlations, and internal consistency was evaluated using Cronbach's alpha, with alpha > 0.70 considered acceptable. To permit full appraisal and replication, the final manuscript should report the pilot sample size, number of items, item correlation range, critical r value, items retained or removed, and Cronbach's alpha for each scale. Because these numerical results were not available in the source manuscript, they were not fabricated; their absence remains a measurement-reporting limitation.

Data were analyzed using SPSS. Univariate analysis summarized participant characteristics and study variables using frequencies, percentages, and appropriate measures of central tendency and dispersion. Distributional assumptions were assessed using the Shapiro-Wilk test. Because both study variables showed non-normal distributions and the relationship was monotonic, Spearman's rank correlation was selected to estimate the direction and strength of association. Statistical significance was set at $p < 0.05$, and the coefficient was interpreted by its magnitude and direction. Results produced by software as $p = 0.000$ were reported as $p < 0.001$ because a probability value cannot equal zero.

Before conducting the study, ethical approval was obtained from the Research Ethics Committee. All respondents received explanations regarding the objectives and procedures of the study before completing the questionnaire. Students who agreed to participate provided informed consent

electronically before the data collection process began.

RESULTS

1. Characteristics of Respondents

Table 1. Characteristics of Respondents

Age	F	%
18 years	20	21.1
19 years	21	22.1
20 years	18	18.9
21 years	19	20.0
22 years	17	17.9
Total	95	100

Based on Table 1, most respondents were 19 years old, totaling 21 respondents (22.1%), while the fewest respondents were 22 years old, totaling 17 respondents (17.9%).

2. Digital Reproductive Health Literacy Among Female Students

Table 2. Digital Reproductive Health Literacy Among Female Students

Category	F	%
Low	22	23.2
Moderate	31	32.6
High	42	44.2
Total	**95**	**100**

Based on Table 2, most respondents demonstrated high levels of digital reproductive health literacy, totaling 42 respondents (44.2%). Meanwhile, 31 respondents (32.6%) had moderate literacy levels and 22 respondents (23.2%) had low literacy levels. These findings indicate that most female students were able to access, understand, and evaluate reproductive health information obtained through digital media.

3. Reproductive Health Behavior Among Female Students

Table 3. Reproductive Health Behavior Among Female Students

Category	F	%
Poor	17	17.9
Moderate	38	40.0
Good	40	42.1
Total	**95**	**100**

Based on Table 3, most respondents demonstrated positive reproductive health behavior, totaling 40 respondents (42.1%). In addition, 38 respondents (40.0%) demonstrated moderate reproductive health behavior, while 17 respondents (17.9%) demonstrated poor reproductive health behavior. These findings suggest that most female students had relatively good reproductive health practices, including menstrual hygiene management, reproductive self-care, and healthy lifestyle behavior.

4. Normality Test Results

Table 4. Normality Test Results

Variable	Shapiro-Wilk Statistic	p-value
Digital Reproductive Health Literacy	0.781	<0.001
Reproductive Health Behavior	0.802	<0.001

Based on Table 4, the Shapiro-Wilk tests for digital reproductive health literacy and reproductive health behavior were statistically significant (both $p < 0.001$), indicating non-normal distributions. Spearman's rank correlation was therefore used for bivariate analysis.

5. Relationship Between Digital Reproductive Health Literacy and Reproductive Health Behavior

Table 5. Relationship Between Digital Reproductive Health Literacy and Reproductive Health Behavior

Variable	Correlation Coefficient (r)	p-value
Digital Reproductive Health Literacy and Reproductive Health Behavior	0.740	<0.001

As shown in Table 5, digital reproductive health literacy was strongly and positively correlated with reproductive health behavior (Spearman's rho = 0.740; $p < 0.001$). Students with higher literacy scores tended to report healthier reproductive health behavior. This association is statistically strong within the sample but

should not be interpreted as evidence that literacy caused the behavior.

DISCUSSION

1. Digital Reproductive Health Literacy Among Female Students

Fewer than half of participants were classified as having high digital reproductive health literacy (44.2%), while 55.8% remained in the moderate or low categories. Thus, describing the sample as generally highly literate would obscure an important educational gap. Health-science enrollment and frequent smartphone use may facilitate access, but neither guarantees the ability to evaluate credibility, recognize misinformation, or apply information appropriately.

Recent university-based research similarly shows heterogeneous digital health literacy profiles rather than uniform competence among digitally connected students (Nie et al., 2023; Ning et al., 2024). The present distribution is therefore plausible, but direct prevalence comparisons require caution because studies use different instruments, thresholds, cultural settings, and health topics.

The health-science environment may provide greater exposure to scientific terminology and health promotion, yet the present study did not compare faculties or measure curriculum exposure. Educational background should therefore be treated as contextual, not as a demonstrated explanation for literacy level. Future studies should test whether coursework, source-evaluation training, digital self-efficacy, or frequency of online information seeking predicts literacy.

Evaluating source credibility is particularly important for reproductive health because social-media content may blend accurate education, personal experience, advertising, and misinformation. Contemporary validation research emphasizes that digital health literacy includes more than finding information; it also involves evaluating reliability and using information in context (Nie et al., 2023). This distinction supports targeted training in lateral reading, author verification, evidence appraisal, and consultation with health professionals.

The moderate and low literacy groups represent a practical priority. Rather than assuming that additional information alone will help, university interventions should teach students how to verify claims, identify conflicts of interest, recognize when self-care is insufficient, and navigate credible reproductive health services.

From a practical perspective, universities can integrate reproductive health source appraisal into orientation courses, learning-management systems, and student health services. Useful content includes verifying authorship and evidence, recognizing misinformation, protecting privacy, applying safe menstrual and genital hygiene, and identifying when professional care is required.

Overall, the literacy findings support a need for structured digital reproductive health education. The program focus should shift from information delivery alone to critical appraisal and application, consistent with recent evidence linking digital health literacy to health-promotion behavior among university students (Yang, 2024).

2. Reproductive Health Behavior Among Female Students

Only 42.1% of participants were categorized as having good reproductive health behavior, while 57.9% reported moderate or poor behavior. The distribution indicates that favorable practices were the largest single category but not the majority of the sample. This more cautious interpretation is important because self-reported behavior may also

be affected by recall and social-desirability bias.

Exposure to health education may support behavior, but the study did not measure curriculum content, service use, or prior reproductive health training. The remaining moderate and poor behavior suggests an information-to-action gap: knowing or encountering health information does not necessarily produce sustained hygiene, lifestyle, or self-care practices.

Digital information can support decisions when users trust credible sources and can translate recommendations into action. Recent evidence among university students links eHealth literacy and perceived information reliability with health-promotion behavior (Yang, 2024). However, behavior also depends on resources, habits, social norms, perceived risk, self-efficacy, and access to appropriate services, which were not measured in this study.

Older eHealth-literacy research provides a conceptual foundation, while newer reproductive health reviews show that health literacy is related to fertility awareness, sexual health knowledge, service navigation, and reproductive decision-making among university students (Prémusz et al., 2025). The present study extends this evidence by examining a broader reproductive self-care outcome in Indonesian female health-science students.

Research conducted by Amelia, (2020) highlighted that social media may positively contribute to women's reproductive health awareness because digital media facilitate easier and faster access to health information. Similarly, Cahyani & Sari, (2025) reported that social media can serve as an effective reproductive health promotion platform because digital-based education is considered more attractive, interactive, and accessible among adolescents and young adults.

The presence of moderate and poor behavior despite academic and digital access indicates that universities need more than one-way health messaging. Practical interventions should combine credible online resources with skills rehearsal, referral information, and opportunities for confidential professional consultation.

Most respondents were aged 18–22 years, which is considered a transitional period into early adulthood. At this stage, students begin developing independence in making health-related decisions while simultaneously being influenced by social environments, digital media exposure, and modern lifestyle trends. These factors may influence the consistency of students in maintaining healthy reproductive health practices in daily life.

Reproductive health behavior is shaped by multiple influences beyond literacy. Accordingly, the findings justify a multicomponent health-promotion response but do not imply that improving digital literacy alone will automatically change behavior.

3. Relationship Between Digital Reproductive Health Literacy and Reproductive Health Behavior

The central finding was a strong positive association between digital reproductive health literacy and reproductive health behavior (rho = 0.740; $p < 0.001$). This magnitude suggests that the constructs are closely related in the study sample, but the cross-sectional design cannot determine direction. Healthier students may seek and evaluate information more actively, literacy may support behavior, or both may reflect shared influences such as education, self-efficacy, socioeconomic resources, and access to care.

A plausible pathway is that students with stronger appraisal skills are

better able to reject misinformation and select actionable guidance for menstrual hygiene, genital care, lifestyle, and help-seeking. Nevertheless, mediation was not tested, and the relationship should not be described as a causal effect.

The direction of association is consistent with recent university research linking digital health literacy with information satisfaction, well-being, and health-promotion behaviour (Chen et al., 2023; Yang, 2024). Reproductive health-specific reviews likewise identify health literacy as relevant to awareness, decisions, and service access, although methods and measures remain heterogeneous (Prémusz et al., 2025).

Conceptually, digital health literacy involves access, comprehension, evaluation, and application. The strong association found here is therefore meaningful because the outcome also requires students to translate information into practice. However, conceptual overlap between application-oriented literacy items and self-reported behavior may inflate the correlation; future studies should examine discriminant validity and use behavioral or clinical indicators where feasible.

The result should also be interpreted within the restricted population. All participants were first-year female health-science students from one university, limiting external validity. The observed coefficient may differ among non-health students, senior cohorts, male students, or universities with different digital and reproductive health resources.

From a theoretical perspective, the findings support models in which health literacy functions as a resource for informed decision-making, while also highlighting the importance of behavioral capability and context. Longitudinal research is needed to test whether literacy precedes behavioral improvement and whether self-efficacy or source trust mediates that relationship.

Research conducted by Fuadah et al., (2024) also showed that better health literacy is associated with improved menstrual hygiene practices among adolescent girls. Meanwhile, Wang et al., (2024) explained that supportive educational environments and self-efficacy contribute to higher levels of health literacy among college students. These findings strengthen the results of this study, which demonstrated that students with better digital reproductive health literacy also tended to demonstrate healthier reproductive health behavior.

Several limitations should temper interpretation: the cross-sectional design, a single institution, a 10% sampling precision, self-reported online questionnaires, possible social-desirability and common-method bias, and incomplete reporting of instrument item validity and scale reliability. Potential confounders such as socioeconomic status, prior health education, digital access, health status, and self-efficacy were not controlled.

Future research should use multi-institutional probability samples, fully report psychometric results, adjust for plausible confounders, and follow students over time. Intervention studies can then determine whether training in source evaluation and reproductive self-care produces measurable and sustained behavioral change.

CONCLUSIONS

Digital reproductive health literacy was strongly and positively associated with reproductive health behavior among first-year female students at the Faculty of Health Sciences, Bina Bangsa University (rho = 0.740; $p < 0.001$). Students with stronger abilities to access, understand, evaluate, and apply digital reproductive health information tended to report healthier

reproductive self-care. However, fewer than half were in the highest literacy or behavior category, and the cross-sectional self-reported design does not establish causality. Theoretically, the findings support digital health literacy as a potential decision-making resource while recognizing the possible influence of self-efficacy, education, access, and other shared determinants. Practically, universities should combine credible reproductive health information with source-evaluation training, misinformation recognition, privacy awareness, self-care skills, and clear referral pathways. Multi-institutional longitudinal and intervention studies with complete psychometric reporting are required before concluding that improved digital literacy causes better reproductive health behavior.

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