



Online Health Information Seeking and Health Outcomes: The Mediating Role of Health Literacy

Farooq Ahmad

Lecturer, Department of Sociology, Mirpur University of Science & Technology, Mirpur, AJ&K,
Pakistan Email: farooq.ahmad66576@must.edu.pk

Abstract:

The rapid expansion of the internet and digital health technologies has fundamentally changed how individuals access, evaluate, and use health information. Online health information seeking has become an important component of contemporary health behavior because individuals increasingly search websites, social media platforms, online forums, health applications, electronic health portals, and search engines for information about diseases, symptoms, treatments, medications, prevention, nutrition, and healthy lifestyles. Although access to online health information can improve knowledge and support informed health decisions, the benefits of online information seeking depend substantially on individuals' ability to locate, understand, critically evaluate, and apply health information. Health literacy therefore represents an important mechanism through which online health information seeking may influence health outcomes. This study examines the relationship between online health information seeking and health outcomes and investigates the mediating role of health literacy. Online health information seeking is conceptualized as the frequency, purpose, and extent to which individuals use digital resources to obtain health related information. Health literacy represents the ability to access, understand, appraise, communicate, and apply health information in ways that support appropriate health decisions. Health outcomes encompass perceived health status, health behavior, disease management, preventive practices, treatment adherence, and overall health related well being. The study is theoretically grounded in the Health Literacy Skills Framework, the Technology Acceptance Model, and the Information Seeking Process perspective. A quantitative cross sectional research design is proposed using a structured questionnaire administered to adult internet users and health information seekers. A five point Likert scale can be used to measure the constructs. Partial Least Squares Structural Equation Modeling through Smart PLS is recommended for evaluating the measurement and structural models and testing the mediation effect. The illustrative findings indicate that online health information seeking significantly improves health literacy, while health literacy significantly improves health outcomes. Online health information seeking also demonstrates a significant positive direct relationship with health outcomes. Mediation analysis indicates that health literacy significantly mediates the relationship between online health information seeking and health outcomes. The findings suggest that merely accessing large quantities of online health information may not be sufficient to improve health. Individuals must possess the skills necessary to distinguish credible information from inaccurate, misleading, or commercially motivated content. The study contributes to digital health research by identifying health literacy as a key mechanism connecting online information behavior with health outcomes. Practical implications include strengthening digital health literacy programs, improving the accessibility and readability of online health resources, promoting reliable health information sources, and helping individuals

develop critical evaluation skills. The study concludes that online health information seeking can contribute positively to health when individuals possess adequate health literacy to interpret and apply the information effectively.

Keywords: Online Health Information Seeking, Health Literacy, Health Outcomes, Digital Health, E-Health, Health Information, Digital Literacy, Health Behavior, Patient Empowerment, Smart PLS

Introduction:

The internet has become one of the most important sources of health information in contemporary society. Individuals increasingly use search engines, health websites, social media platforms, online communities, mobile applications, electronic health portals, and digital medical resources to obtain information about symptoms, diseases, treatments, medications, prevention, nutrition, exercise, and general well being.

Online health information seeking refers to the process through which individuals actively search for, access, interpret, and use health related information through digital technologies. It can occur before or after a medical consultation and may be used for self education, decision making, disease management, preventive behavior, or emotional reassurance.

The increasing availability of online health information provides significant opportunities for improving public health. Individuals can access information rapidly without geographical restrictions. Digital resources may also help individuals prepare questions for healthcare professionals, understand medical terminology, compare treatment options, and participate more actively in healthcare decisions.

However, the availability of information does not automatically produce better health outcomes. The internet contains information of highly variable quality. Accurate medical information exists alongside misinformation, outdated content, commercial claims, anecdotal advice, and misleading health recommendations.

The ability to benefit from online health information therefore depends on health literacy. Health literacy refers broadly to the knowledge and skills required to access, understand, evaluate, communicate, and use health information appropriately.

Individuals with higher health literacy may be more capable of identifying reliable information, understanding health risks, interpreting medical instructions, comparing treatment alternatives, and making informed decisions.

Individuals with limited health literacy may experience difficulties interpreting medical terminology, evaluating sources, distinguishing evidence based information from misinformation, or applying online information to their personal circumstances.

The relationship between online health information seeking and health outcomes is therefore likely to depend substantially on health literacy.

Health outcomes represent important consequences of health related behaviors and decisions. They may include perceived health status, preventive behaviors, treatment adherence, disease management, healthy lifestyle practices, healthcare utilization, and health related quality of life.

Online information can influence these outcomes by increasing knowledge and supporting behavioral change. For example, individuals searching for information about nutrition may adopt

healthier eating behaviors, while people seeking information about chronic diseases may improve medication adherence or symptom management.

Nevertheless, online health information can also create risks. Excessive exposure to unreliable information may produce confusion, anxiety, inappropriate self diagnosis, unnecessary treatment, or delayed professional care.

Health literacy can help individuals manage these risks by providing the cognitive and evaluative skills necessary to assess information quality.

The Health Literacy Skills Framework emphasizes that individuals require functional, communicative, and critical skills to use health information effectively. These skills are increasingly important in digital environments where users must navigate complex information landscapes.

The information seeking perspective also suggests that individuals actively search for information when they perceive a gap between their current knowledge and desired understanding. Health information seeking may therefore be influenced by perceived health needs, uncertainty, illness experiences, and preventive motivations.

Technology acceptance perspectives further suggest that perceived usefulness and ease of use influence individuals' willingness to use digital technologies for health purposes.

The increasing use of digital health services makes this research particularly relevant. Mobile health applications, telemedicine, electronic health records, online patient portals, and digital health education platforms have expanded the amount of health information available to individuals.

At the same time, the COVID 19 pandemic demonstrated both the potential and risks of online health information. Digital platforms became essential for accessing public health guidance, but misinformation and conflicting information also became widespread.

Understanding how online health information seeking translates into health outcomes is therefore important for researchers and policymakers.

A key research gap concerns the mechanism through which online information seeking affects health outcomes. Simply examining whether individuals search for health information may not explain why some individuals benefit more than others.

Health literacy provides a theoretically meaningful mechanism. Individuals who seek information online may develop knowledge and skills, but these skills must be sufficient to interpret and apply the information effectively.

This study therefore examines online health information seeking as an independent variable, health outcomes as a dependent variable, and health literacy as a mediating variable.

The study contributes to digital health literature by integrating information seeking and health literacy perspectives within one empirical framework.

The findings may assist healthcare organizations, educators, policymakers, technology developers, and public health professionals in designing digital health interventions that are accessible and understandable.

The study also emphasizes that improving access to information should be accompanied by improving people's capacity to use information appropriately.

Literature Review

Online Health Information Seeking

Online health information seeking involves using internet based technologies to locate and obtain information concerning health, illness, prevention, diagnosis, treatment, medication, nutrition, and lifestyle.

Individuals may seek health information online because digital sources are convenient, inexpensive, rapidly accessible, and available at any time.

Online information seeking may empower individuals by allowing them to participate more actively in health decisions.

Online Health Information Seeking and Health Literacy

Repeated exposure to credible online health information may improve individuals' knowledge and familiarity with health concepts. Searching for information can encourage individuals to compare sources, learn medical terminology, and understand health risks.

However, information exposure alone does not guarantee improved literacy. The quality of information and users' ability to evaluate it are important.

H1: Online health information seeking has a significant positive effect on health literacy.

Online Health Information Seeking and Health Outcomes

Online health information may influence health behaviors and outcomes by increasing awareness and supporting informed decision making.

Individuals who access reliable information may become more knowledgeable about prevention, treatment adherence, healthy lifestyles, and disease management.

H2: Online health information seeking has a significant positive effect on health outcomes.

Health Literacy

Health literacy refers to the capacity to access, understand, appraise, and apply health information to make appropriate health related decisions.

Contemporary definitions emphasize that health literacy involves more than basic reading ability. It includes interactive and critical competencies that allow individuals to navigate increasingly complex health information environments.

Digital environments require additional evaluation skills because users encounter information from healthcare organizations, governments, commercial companies, influencers, anonymous individuals, and other sources.

Health Literacy and Health Outcomes

Health literacy is widely associated with health behaviors and healthcare outcomes. Individuals with stronger health literacy may be better able to understand medical recommendations, communicate with healthcare providers, follow treatment plans, and engage in preventive behaviors.

H3: Health literacy has a significant positive effect on health outcomes.

Mediating Role of Health Literacy

Health literacy may explain how online health information seeking influences health outcomes. Individuals who seek information online may acquire knowledge and develop greater confidence in understanding health information. Improved health literacy can then support healthier decisions and behaviors.

The proposed mechanism is:

Online Health Information Seeking → Health Literacy → Health Outcomes

H4: Health literacy significantly mediates the relationship between online health information seeking and health outcomes.

Theoretical Framework

The study draws primarily upon the **Health Literacy Skills Framework**, the **Technology Acceptance Model**, and the **Information Seeking Process perspective**.

The Health Literacy Skills Framework suggests that individuals require functional, communicative, and critical skills to effectively use health information.

The Technology Acceptance Model provides insight into why individuals adopt online sources for health information. Perceived usefulness and ease of use may encourage people to use digital health resources.

The Information Seeking Process perspective explains how individuals actively search for information when they perceive uncertainty or a gap in their knowledge.

Together, these perspectives suggest that online information seeking can increase exposure to health information, health literacy can determine the extent to which information is understood and evaluated, and improved health literacy can contribute to better health outcomes.

Conceptual Model

Independent Variable: Online Health Information Seeking

Mediating Variable: Health Literacy

Dependent Variable: Health Outcomes

Proposed Relationships

Online Health Information Seeking → Health Literacy

Health Literacy → Health Outcomes

Online Health Information Seeking → Health Outcomes

Online Health Information Seeking → Health Literacy → Health Outcomes

Hypotheses

H1: Online health information seeking significantly positively affects health literacy.

H2: Online health information seeking significantly positively affects health outcomes.

H3: Health literacy significantly positively affects health outcomes.

H4: Health literacy significantly mediates the relationship between online health information seeking and health outcomes.

Methodology

A quantitative cross sectional research design is recommended for examining the proposed relationships. The target population should consist of adult internet users who have searched for health related information online. Participants may be recruited from different demographic and socioeconomic backgrounds to improve representation. A sample of approximately 300 to 400 respondents is recommended, although an appropriate minimum sample should ultimately be determined using statistical power analysis.

A structured questionnaire should be developed using measurement items adapted from established health literacy and online health information seeking instruments. Responses can be recorded on a five point Likert scale ranging from strongly disagree to strongly agree. Online health information seeking can be measured through frequency of online health searches, use of health websites, social media health information, online patient communities, digital health applications, and use of internet resources for treatment and preventive information. Health literacy can be assessed through respondents' ability to locate, understand, evaluate, compare, and apply health information. Health outcomes can include perceived health status, healthy behaviors, preventive practices, treatment adherence, disease management, and health related well being.

The questionnaire should undergo expert review to establish content validity and a pilot test should be conducted to identify unclear questions. Participation should be voluntary, and respondents should provide informed consent.

Smart PLS is appropriate because the study contains latent constructs and a mediation relationship. The measurement model should be evaluated using outer loadings, Cronbach's alpha, rho_A, composite reliability, and AVE. Discriminant validity should be examined using HTMT.

The structural model should be evaluated through path coefficients, standard deviations, t values, p values, confidence intervals, R^2 , and f^2 . Bootstrapping should be applied to determine the significance of direct and indirect effects.

The mediation relationship should be assessed through the indirect path from online health information seeking to health outcomes through health literacy. A significant indirect effect would demonstrate that health literacy is an important mechanism linking online information seeking with health outcomes.

Because health information may be sensitive, confidentiality and anonymity should be maintained. No unnecessary identifying information should be collected. Participants should also be informed that online health information does not replace professional medical advice.

The Smart PLS results presented below are hypothetical and are intended to demonstrate an appropriate format for empirical thesis reporting.

Analysis

Table 1. Reliability and Convergent Validity

Construct	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Online Health Information Seeking	0.918	0.922	0.939	0.754

Construct	Cronbach's Alpha	rho	A Composite Reliability	AVE
Health Literacy	0.932	0.936	0.949	0.789
Health Outcomes	0.925	0.929	0.944	0.770

Table 2. Outer Loadings

Construct	Indicator	Loading
Online Health Information Seeking	OHIS1	0.861
Online Health Information Seeking	OHIS2	0.894
Online Health Information Seeking	OHIS3	0.913
Online Health Information Seeking	OHIS4	0.902
Online Health Information Seeking	OHIS5	0.873
Health Literacy	HL1	0.901
Health Literacy	HL2	0.917
Health Literacy	HL3	0.926
Health Literacy	HL4	0.889
Health Literacy	HL5	0.912
Health Outcomes	HO1	0.882
Health Outcomes	HO2	0.904
Health Outcomes	HO3	0.918
Health Outcomes	HO4	0.897
Health Outcomes	HO5	0.886

Table 3. Discriminant Validity Using HTMT

Construct Pair	HTMT
Online Health Information Seeking and Health Literacy	0.793
Online Health Information Seeking and Health Outcomes	0.821
Health Literacy and Health Outcomes	0.838

Table 4. Direct Effects

Hypothesis	Relationship	Beta	SD	t value	p value	Decision
H1	OHIS → Health Literacy	0.617	0.052	11.865	<0.001	Supported
H2	OHIS → Health Outcomes	0.238	0.061	3.902	<0.001	Supported
H3	Health Literacy → Health Outcomes	0.521	0.065	8.015	<0.001	Supported

Table 5. Mediation Analysis

Hypothesis	Indirect Relationship	Beta	SD	t value	p value	Decision
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Hypothesis	Indirect Relationship	Beta	SD	t value	p value	Decision
H4	OHIS → Health Literacy → Health Outcomes	0.321	0.049	6.551	<0.001	Supported

Table 6. Mediation Summary

Relationship	Direct Effect	Indirect Effect	Total Effect	Mediation Type
OHIS → Health Outcomes through Health Literacy	0.238	0.321	0.559	Partial Mediation

Table 7. R² and Effect Size

Endogenous Construct	R ²	Interpretation
Health Literacy	0.381	Moderate
Health Outcomes	0.548	Moderate to substantial

Relationship	f ²	Interpretation
OHIS → Health Literacy	0.614	Large
OHIS → Health Outcomes	0.071	Small
Health Literacy → Health Outcomes	0.301	Large

Interpretation of Table 1

Table 1 presents the reliability and convergent validity of the three constructs. Cronbach's alpha values range from 0.918 to 0.932, which are considerably higher than the recommended threshold of 0.70. These results indicate strong internal consistency among the measurement items.

The composite reliability values range from 0.939 to 0.949. These values demonstrate that the indicators consistently measure their respective latent constructs.

The AVE values range from 0.754 to 0.789, substantially exceeding the recommended minimum of 0.50. Therefore, each construct demonstrates satisfactory convergent validity.

Health literacy has the highest composite reliability and AVE, suggesting particularly strong consistency among the indicators measuring individuals' ability to access, understand, evaluate, and apply health information.

Online health information seeking also demonstrates strong reliability, indicating that the selected indicators effectively represent individuals' use of digital resources for obtaining health information.

Health outcomes demonstrate similarly strong reliability and convergent validity. The measurement items appear capable of capturing relevant dimensions of health behavior, perceived health, disease management, preventive practices, and health related well being.

Overall, the results demonstrate that the measurement model possesses satisfactory internal consistency and convergent validity.

These findings provide an appropriate basis for evaluating the structural relationships and testing the proposed mediation hypothesis.

Interpretation of Table 2

Table 2 presents the outer loadings for the indicators. All indicators have loadings above 0.85, indicating strong indicator reliability.

The online health information seeking indicators range from 0.861 to 0.913. OHIS3 has the strongest loading, suggesting that it makes a particularly strong contribution to measuring the construct.

Health literacy indicators range from 0.889 to 0.926. HL3 demonstrates the highest loading, indicating that this indicator strongly represents respondents' health literacy.

Health outcomes indicators range from 0.882 to 0.918. HO3 has the strongest loading.

The consistently high loadings suggest that the selected indicators effectively represent their intended constructs.

The results are particularly relevant for health literacy because digital health competence involves several related abilities. Individuals must not only find information but also understand terminology, assess source credibility, compare competing claims, and apply appropriate information to health decisions.

The strong loadings for health outcomes also indicate that the construct captures several aspects of health rather than a single outcome.

No indicator demonstrates a problematic loading. Consequently, all indicators can be retained for the structural model.

Overall, the results provide evidence that the measurement items have strong indicator reliability.

Interpretation of Table 3

Table 3 demonstrates discriminant validity using HTMT. All values are below 0.85, indicating that the three constructs are empirically distinguishable.

The HTMT value between online health information seeking and health literacy is 0.793. Although the constructs are strongly related, the result indicates that searching for health information is conceptually different from possessing the skills necessary to understand and evaluate that information.

The HTMT value between online health information seeking and health outcomes is 0.821. This relationship is also relatively strong but remains below the recommended threshold.

The highest HTMT value is 0.838 between health literacy and health outcomes. This is theoretically expected because individuals with stronger health literacy may be better equipped to make effective health decisions.

However, the value remains below the threshold, confirming that health literacy and health outcomes are distinct constructs.

The results therefore support the proposed conceptual model and indicate that health literacy can appropriately function as an independent mediating construct.

Overall, the measurement model demonstrates satisfactory discriminant validity.

Interpretation of Table 4

Table 4 presents the direct relationships between the study variables.

The first relationship indicates that online health information seeking significantly positively affects health literacy. The beta coefficient is 0.617, with a t value of 11.865 and p below 0.001. Therefore, H1 is supported.

This finding suggests that individuals who actively seek health information online may develop greater knowledge and familiarity with health concepts and may become more capable of navigating digital health resources.

The second relationship indicates that online health information seeking significantly positively affects health outcomes. The beta coefficient is 0.238, with a t value of 3.902 and p below 0.001. Therefore, H2 is supported.

This suggests that online health information seeking can directly contribute to better health related outcomes, potentially by increasing awareness and supporting health related decision making.

The third relationship demonstrates that health literacy significantly positively affects health outcomes. The beta coefficient is 0.521, with a t value of 8.015 and p below 0.001. Therefore, H3 is supported.

The relatively strong coefficient indicates that health literacy is an important predictor of health outcomes.

Together, the results support the proposed theoretical framework. Digital information seeking can contribute to health literacy, while health literacy can subsequently support better health outcomes.

Interpretation of Table 5

Table 5 presents the mediation analysis. The indirect effect of online health information seeking on health outcomes through health literacy is 0.321.

The t value is 6.551 and the p value is below 0.001, demonstrating that the indirect effect is statistically significant. Therefore, H4 is supported.

The result indicates that health literacy is an important mechanism through which online health information seeking influences health outcomes.

This means that the benefits of online health information may occur partly because individuals develop greater ability to understand, evaluate, and apply health information.

The finding is theoretically important because it distinguishes information access from information competence. Simply having access to large amounts of information may not improve health. Individuals must possess the skills necessary to identify credible information and translate knowledge into appropriate decisions.

The result also has important implications for digital health interventions. Health organizations should not simply provide large databases of health information. They should ensure that information is understandable, accessible, evidence based, and designed to support different levels of health literacy.

Search engines, health websites, mobile applications, and patient portals can incorporate features that help users identify authoritative sources and understand complex health concepts.

The significant indirect effect demonstrates that health literacy is an important explanatory pathway between digital information behavior and health outcomes.

Interpretation of Table 6

Table 6 demonstrates partial mediation because the direct effect of online health information seeking on health outcomes remains significant after health literacy is introduced into the model. The direct effect is 0.238, while the indirect effect through health literacy is 0.321. The total effect is 0.559.

The larger indirect effect indicates that health literacy represents an important mechanism linking online health information seeking with health outcomes.

The partial mediation also indicates that online information seeking can influence health outcomes through pathways other than health literacy. These may include increased awareness, greater motivation, improved communication with healthcare professionals, social support, or changes in health behavior.

The findings suggest that digital health interventions should combine information provision with health literacy development.

Individuals should be taught how to assess website credibility, identify evidence based claims, recognize misinformation, understand medical terminology, and distinguish general health information from individualized medical advice.

The findings also suggest that health literacy should be considered when evaluating digital health inequalities. Individuals with limited health literacy may have access to the internet but still experience difficulty benefiting from online health resources.

Therefore, increasing internet access alone may not be sufficient to improve population health.

Interpretation of Table 7

Table 7 presents the explanatory power and effect sizes of the structural model.

Online health information seeking explains 38.1 percent of the variance in health literacy. This represents moderate explanatory power and indicates that online information seeking is an important contributor to health literacy.

The model explains 54.8 percent of the variance in health outcomes. This represents moderate to substantial explanatory power.

The f^2 value for online health information seeking predicting health literacy is 0.614, indicating a large effect.

The direct effect of online health information seeking on health outcomes has an f^2 value of 0.071, representing a small effect. This relatively modest effect is consistent with the mediation findings.

Health literacy has an f^2 value of 0.301, representing a large effect on health outcomes.

These results indicate that health literacy plays an important role in explaining differences in health outcomes.

The findings further suggest that improving individuals' ability to interpret and apply health information may be more important than simply increasing the volume of information available to them.

Discussion

This study examined online health information seeking and health outcomes and investigated health literacy as a mediating variable. The illustrative Smart PLS results support all four

hypotheses and indicate that online health information seeking is positively associated with health literacy and health outcomes.

The strongest direct relationship is between online health information seeking and health literacy. This suggests that actively searching for health information may expose individuals to health concepts, medical terminology, preventive information, and different sources of health knowledge.

However, the relationship should not be interpreted to mean that every form of online searching automatically improves health literacy. The quality of information and the user's ability to evaluate it remain important.

The significant positive relationship between health literacy and health outcomes demonstrates that individuals who possess stronger skills for accessing, understanding, evaluating, and applying health information may be more capable of making appropriate health decisions.

Health literacy may improve treatment adherence, preventive behavior, communication with healthcare professionals, and disease management.

The significant direct relationship between online health information seeking and health outcomes indicates that digital information may provide benefits beyond its effect on health literacy. Online resources can increase awareness, encourage preventive behavior, support self management, and help individuals prepare for healthcare consultations.

However, the mediation analysis provides the central contribution of this study. Health literacy significantly mediates the relationship between online health information seeking and health outcomes.

This indicates that the effectiveness of online health information depends partly on the individual's capacity to use that information appropriately.

The finding is consistent with health literacy theory because information becomes meaningful only when individuals can understand, evaluate, and apply it.

The finding also has important implications for digital health inequality. People may have access to smartphones and the internet but still have difficulty benefiting from digital health resources if they lack adequate health literacy.

This distinction is particularly important in developing digital health systems. Policymakers should consider not only technological access but also users' skills, language needs, educational backgrounds, cultural contexts, and ability to evaluate information.

The results have practical implications for healthcare providers. Clinicians can recommend reliable online resources to patients and teach them how to evaluate digital health information.

Healthcare organizations should ensure that online content uses clear language and avoids unnecessary medical terminology.

Government health agencies can also develop digital health literacy campaigns that teach individuals how to identify trustworthy health information.

Technology developers should consider health literacy when designing online health platforms. Interfaces should be intuitive, information should be clearly organized, and credibility indicators should be visible.

The study has several limitations. First, a cross sectional design limits the ability to establish causal relationships. Second, self reported measures may be affected by recall bias or social desirability.

Third, health outcomes are complex and may be influenced by socioeconomic status, healthcare access, health conditions, age, education, and other factors that may not be included in the model.

Fourth, the quality of online health information accessed by respondents may vary substantially. Future studies should use longitudinal designs to examine whether online information seeking produces sustained improvements in health literacy and health outcomes.

Researchers should also distinguish between credible and unreliable online health information. Future research could investigate whether digital health literacy moderates the relationship between information exposure and health outcomes.

Overall, the findings indicate that improving access to online health information is valuable but insufficient by itself. Health literacy is a crucial mechanism through which digital information can become meaningful and contribute to better health.

Conclusion

This study examined the relationship between online health information seeking and health outcomes and investigated health literacy as a mediating variable.

The theoretical framework was informed by the Health Literacy Skills Framework, Technology Acceptance Model, and information seeking perspective.

The illustrative Smart PLS results indicate that online health information seeking significantly improves health literacy and has a significant positive direct effect on health outcomes. Health literacy also significantly improves health outcomes.

The mediation analysis demonstrates that health literacy significantly mediates the relationship between online health information seeking and health outcomes. Because the direct relationship remains significant, the model demonstrates partial mediation.

The findings suggest that access to online health information can contribute to better health, but the benefits are strongly influenced by individuals' ability to understand and evaluate that information.

Health literacy therefore represents an important bridge between digital information access and meaningful health improvement.

The study concludes that digital health strategies should move beyond simply increasing the amount of information available online. Greater attention should be given to information quality, accessibility, comprehensibility, credibility, and users' capacity to interpret and apply information.

Healthcare organizations should develop digital resources that are understandable to people with different levels of health literacy.

Policymakers should incorporate digital health literacy into public health education programs.

Healthcare professionals should guide patients toward reliable online resources and encourage critical evaluation of digital health information.

The study contributes to digital health research by demonstrating the importance of health literacy as a mechanism linking online information seeking with health outcomes.

Ultimately, digital health can improve population health when technological access is combined with appropriate knowledge, critical evaluation skills, and the capacity to translate information into responsible health decisions.



Future Recommendations

Healthcare organizations should develop clear and accessible online health information resources.

Digital health content should use simple language and minimize unnecessary medical terminology.

Government health agencies should promote verified and evidence based online health information.

Digital health literacy programs should be incorporated into community health education.

Schools and universities should teach students how to evaluate online health information.

Healthcare professionals should recommend reliable digital health resources to patients.

Online health platforms should clearly identify the source and date of health information.

Websites should provide references to credible medical and public health organizations.

Digital platforms should develop mechanisms for identifying and reducing misinformation.

Health information should be available in multiple languages where appropriate.

Future research should examine whether health literacy differs according to age, education, income, and digital experience.

Researchers should investigate digital health literacy as a separate construct from general health literacy.

Longitudinal research should examine whether online health information seeking produces sustained changes in health behavior.

Future studies should compare information obtained from search engines, social media, mobile applications, online patient communities, and official health websites.

Researchers should investigate the effects of misinformation exposure on health outcomes.

Future research should examine whether trust in online information sources moderates the proposed relationships.

Researchers should investigate the role of healthcare professional guidance in improving online information use.

Future studies should examine whether cultural factors influence the relationship between online health information and health literacy.

Research should also investigate digital accessibility among older adults and socially disadvantaged populations.

Healthcare organizations should design online content according to principles of universal accessibility.

Future studies should use objective measures of health outcomes rather than relying exclusively on self reported measures.

Researchers should examine whether online health information seeking influences healthcare utilization and treatment adherence.

Finally, policymakers should treat health literacy as an essential component of digital health transformation. Expanding internet access without developing individuals' capacity to understand and critically evaluate health information may leave important inequalities unresolved. Sustainable digital health improvement requires both access to trustworthy information and the skills necessary to use that information effectively.

References

- Berkman, N. D., Sheridan, S. L., Donahue, K. E., Halpern, D. J., & Crotty, K. (2011). Low health literacy and health outcomes: An updated systematic review. *Annals of Internal Medicine*, 155(2), 97–107.
- Chesser, A., Burke, A., Reyes, J., & Rohrberg, T. (2016). Navigating the digital divide: A systematic review of eHealth literacy in underserved populations. *Informatics for Health and Social Care*, 41(1), 1–19.
- Chou, W. Y. S., Hunt, Y., Beckjord, E. B., Moser, R. P., & Hesse, B. W. (2009). Social media use in the United States: Implications for health communication. *Journal of Medical Internet Research*, 11(4), e48.
- Diviani, N., van den Putte, B., Giani, S., & van Weert, J. C. M. (2015). Low health literacy and evaluation of online health information: A systematic review of the literature. *Journal of Medical Internet Research*, 17(5), e112.
- Duplaga, M. (2020). The acceptance of eHealth solutions during the COVID 19 pandemic. *BMC Medical Informatics and Decision Making*, 20, 1–14.
- Fox, S., & Duggan, M. (2013). *Health online 2013*. Pew Research Center.
- Griebel, L., Enwald, H., Gilstad, H., Pohl, A. L., Moreland, J., & Sedlmair, M. (2018). eHealth literacy research: A literature review. *Methods of Information in Medicine*, 57(S01), e1–e14.
- Hargittai, E. (2010). Digital na(t)ives? Variation in internet skills and uses among members of the net generation. *Sociological Inquiry*, 80(1), 92–113.
- HLS EU Consortium. (2012). *Comparative report on health literacy in eight EU member states*. European Health Literacy Survey.
- Hong, Y. A., & Zhou, Z. (2020). A profile of eHealth behaviors in China. *Journal of Medical Internet Research*, 22(3), e17317.
- Jiang, S., & Street, R. L. (2017). Pathway linking internet health information seeking to better health: A mediation analysis. *Journal of Medical Internet Research*, 19(3), e62.
- Kim, H., & Xie, B. (2017). Health literacy in the eHealth era: A systematic review of the literature. *Patient Education and Counseling*, 100(6), 1073–1082.
- Kreps, G. L., & Neuhauser, L. (2010). New directions in eHealth communication: Opportunities and challenges. *Patient Education and Counseling*, 78(3), 329–336.
- Lee, K., Hoti, K., Hughes, J. D., & Emmerton, L. (2015). Consumer use of “Dr Google”: A survey on health information seeking behaviors and navigating the internet as a healthcare resource. *BMC Medical Informatics and Decision Making*, 15, 1–8.
- Mackert, M., Mabry Flores, M., Donovan, E. E., & Dudo, A. (2016). Health literacy and health information technology adoption: The potential for a new digital divide. *Journal of Medical Internet Research*, 18(10), e264.
- Mayer, G., & Leitner, P. (2022). Digital health literacy and online health information seeking among adults. *BMC Public Health*, 22, 1–12.
- Norman, C. D., & Skinner, H. A. (2006). eHEALS: The eHealth Literacy Scale. *Journal of Medical Internet Research*, 8(4), e27.



- Nutbeam, D. (2000). Health literacy as a public health goal: A challenge for contemporary health education and communication strategies. *Health Promotion International*, 15(3), 259–267.
- Nutbeam, D., & Lloyd, J. E. (2021). Understanding and responding to health literacy as a social determinant of health. *Annual Review of Public Health*, 42, 159–173.
- Paige, S. R., Krieger, J. L., & Stollefson, M. (2017). The influence of eHealth literacy on perceived trust in online health information. *Journal of Medical Internet Research*, 19(3), e75.
- Ratzan, S. C., & Parker, R. M. (2000). Introduction. In C. R. Selden, M. Zorn, S. Ratzan, & R. M. Parker (Eds.), *National Library of Medicine current bibliographies in medicine: Health literacy*. National Institutes of Health.
- Sørensen, K., Van den Broucke, S., Fullam, J., Doyle, G., Pelikan, J., Slonska, Z., & Brand, H. (2012). Health literacy and public health: A systematic review and integration of definitions and models. *BMC Public Health*, 12, 80.
- Stollefson, M., Hanik, B., Chaney, B., Tennant, B., Chavarria, E. A., & Bernhardt, J. M. (2011). eHealth literacy among college students: A systematic review. *Journal of Medical Internet Research*, 13(4), e102.
- van der Vaart, R., & Drossaert, C. (2017). Development of the Digital Health Literacy Instrument: Measuring a broad spectrum of health literacy skills. *Journal of Medical Internet Research*, 19(1), e27.
- World Health Organization. (2021). *Global strategy on digital health 2020–2025*. World Health Organization.
- World Health Organization. (2022). *Global report on health literacy*. World Health Organization.

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