

Digital Health Literacy and Its Impact on Preventive Health Behavior among Community Populations

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ABSTRACT

This study examines the influence of digital health literacy on preventive health behavior among community populations within contemporary digital healthcare environments. The research aims to analyze how individuals access, interpret, and utilize digital health information in shaping preventive healthcare practices and to identify the social and behavioral factors influencing digital health literacy. The study employed a qualitative approach using a case study research design because this method enables an in-depth exploration of community experiences, perceptions, and behavioral adaptation related to digital health information. The research was conducted in Bandung Regency, West Java, Indonesia, due to the region's diverse demographic characteristics and increasing utilization of digital healthcare communication. The study involved twenty participants consisting of community members, healthcare practitioners, public health officials, and community leaders selected through purposive sampling because they possessed direct experience related to digital health information and preventive healthcare activities. The findings reveal that digital health literacy significantly influences preventive health behavior, particularly in improving healthcare awareness, information evaluation, and participation in preventive healthcare practices. However, disparities in education, digital competence, and access to reliable information remain major challenges. The study recommends strengthening community-based digital health literacy programs, improving digital healthcare communication strategies, and expanding inclusive preventive healthcare education initiatives.



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INTRODUCTION

Digital transformation has substantially altered the delivery, accessibility, and utilization of health information across societies (Rashed, 2025). The rapid expansion of internet connectivity, mobile technologies, telemedicine platforms, and social media applications has enabled communities to obtain health-related information more efficiently than in previous decades. Within this context, digital health literacy has emerged as a critical determinant influencing individual and collective health outcomes (Goldsbury et al., 2023). Digital health literacy refers to the capacity of individuals to access, understand, evaluate, and apply digital health information in order to make informed health decisions. The relevance of this concept has increased significantly in the contemporary public health landscape because preventive health behavior increasingly depends on the ability of community members to navigate digital sources responsibly and critically. Preventive practices such as vaccination participation, balanced nutrition, physical activity, early disease screening, sanitation maintenance, and adherence to public health recommendations are now strongly connected to the quality of information accessed through digital platforms (Khan et al., 2024).

The development of digital health communication has provided both opportunities and challenges for community populations. On the one hand, digital technology facilitates rapid dissemination of health education, supports community empowerment, and broadens access to preventive healthcare information regardless of geographical limitations (P. Wang et al., 2024). On the

other hand, the widespread circulation of misinformation, low-quality medical content, and unverified health advice creates substantial risks for public health behavior. Many individuals encounter difficulties in distinguishing scientifically valid information from misleading digital narratives (Jung & Gu, 2024). This condition contributes to misconceptions regarding disease prevention, distrust toward healthcare institutions, and unhealthy behavioral patterns. Consequently, disparities in digital health literacy may directly influence the effectiveness of preventive healthcare strategies among diverse populations.

Previous studies have demonstrated that higher levels of digital health literacy are positively associated with healthier lifestyle choices and stronger participation in preventive healthcare programs (Tushe & Karagjozi, 2024). Individuals with adequate digital competencies are generally more capable of understanding disease prevention campaigns, evaluating online medical resources, and implementing evidence-based health practices in daily life. However, existing literature remains predominantly concentrated on urban populations, students, healthcare workers, or technologically advanced societies. Comparatively limited attention has been devoted to broader community populations characterized by diverse educational backgrounds, socioeconomic conditions, and digital access capacities (Shakya et al., 2025). Furthermore, several prior studies primarily examined digital literacy from a technological perspective without integrating behavioral, sociocultural, and preventive health dimensions comprehensively. As a result, the relationship between digital health literacy and preventive health behavior within heterogeneous community settings remains insufficiently explored.

The state of the art of this research lies in the integration between digital literacy studies and preventive public health behavior within community populations. Contemporary international research generally focuses either on technological adoption or on isolated health outcomes, while limited investigations analyze how digital health literacy shapes preventive behavior through multidimensional social determinants (Mr et al., 2025). Existing studies also tend to emphasize short-term behavioral responses during public health crises, particularly during the COVID-19 pandemic, rather than evaluating sustainable preventive behavior in broader community contexts. Therefore, there is a significant need for more comprehensive scholarly examination that connects digital health literacy with long-term preventive health behavior among general populations.

The primary problem addressed in this research concerns the uneven level of digital health literacy within communities and its implications for preventive health practices. In many regions, individuals possess access to digital devices but lack the competencies required to critically assess the reliability and accuracy of online health information (Panday et al., 2024). This condition may result in inappropriate self-medication, reluctance to participate in vaccination programs, delayed medical consultation, and poor compliance with preventive healthcare recommendations. In addition, vulnerable groups such as older adults, low-income populations, and individuals with limited educational attainment frequently experience barriers in understanding digital health content (Almeida, 2025). These inequalities contribute to broader public health disparities and weaken the effectiveness of national health promotion strategies.

The research gap identified in this study is associated with the limited availability of empirical investigations examining the direct influence of digital health literacy on preventive health behavior among diverse community populations using interdisciplinary perspectives. Previous research often employed fragmented analytical frameworks that separated technological literacy from behavioral health outcomes. Moreover, only a small number of studies evaluated how sociocultural conditions, educational attainment, and access inequality interact with digital health literacy in shaping preventive behavior (Songsin et al., 2025). Existing literature also lacks comprehensive discussion concerning the practical implications of digital health literacy for community-based health promotion programs. Consequently, further research is required to develop a more integrative understanding of the relationship between digital health literacy and preventive healthcare behavior within contemporary societies.

The novelty of this research is reflected in its multidimensional approach that combines digital literacy, behavioral health theory, and community-based public health analysis. This study not only examines the accessibility of digital health information but also evaluates individuals' capacities

to critically interpret, verify, and implement health knowledge within preventive healthcare practices. In addition, this research highlights the influence of social and educational disparities on digital health behavior, thereby contributing a broader conceptual framework for understanding community health transformation in the digital era. The study also seeks to provide a contextualized analysis relevant to developing societies where technological advancement is not always accompanied by equal digital competencies among populations.

Based on these considerations, the research formulates several central questions. The first question concerns how digital health literacy influences preventive health behavior among community populations. The second question examines the extent to which socioeconomic and educational factors affect digital health literacy capacities. The third question investigates the relationship between the quality of digital health information and community participation in preventive healthcare practices. The final question explores how digital health literacy can strengthen public health promotion strategies in contemporary societies.

The objective of this research is to analyze the influence of digital health literacy on preventive health behavior among community populations. The study also aims to identify the determinants affecting digital health literacy and to examine how digital information accessibility contributes to preventive healthcare awareness. Furthermore, this research seeks to develop a conceptual understanding regarding the role of digital health literacy in supporting sustainable public health improvement (George et al., 2024). Through these objectives, the study intends to generate evidence-based recommendations for policymakers, healthcare institutions, and community organizations in strengthening preventive health interventions.

Theoretically, this research contributes to the development of interdisciplinary public health scholarship by integrating digital literacy perspectives with preventive health behavior theories. The findings are expected to enrich academic discourse regarding the role of digital competencies in shaping contemporary health outcomes and provide an expanded analytical framework for future health communication studies. Academically, this research offers empirical evidence that may serve as a scientific reference for scholars, researchers, and students interested in digital health transformation, health communication, and community-based preventive healthcare. The study also contributes to the advancement of scientific literature within international public health journals emphasizing evidence-based and socially relevant healthcare research.

Practically, the findings of this research are expected to support policymakers in designing more inclusive digital health promotion strategies that address inequalities in digital literacy (Zulu et al., 2025). Healthcare institutions may utilize the results to improve digital health education programs and strengthen community engagement in preventive healthcare initiatives. Community organizations and educational institutions may also benefit from the findings by developing literacy-based interventions aimed at enhancing public awareness regarding reliable digital health information. Ultimately, strengthening digital health literacy may contribute to healthier behavioral patterns, reduced misinformation exposure, and improved public participation in preventive healthcare programs.

Despite its anticipated contributions, this research possesses several limitations. The study may encounter challenges related to variations in digital access, demographic diversity, and differences in educational backgrounds among respondents. Additionally, preventive health behavior is influenced by numerous external factors, including cultural norms, economic conditions, healthcare infrastructure, and governmental policies, which may not be fully captured within a single study framework. The reliance on self-reported responses may also introduce subjectivity and response bias in measuring digital literacy and behavioral practices.

Therefore, future research is encouraged to employ longitudinal and comparative approaches in order to examine the long-term effects of digital health literacy on preventive healthcare outcomes across different social contexts (Mokoena et al., 2025). Subsequent studies may also explore the role of artificial intelligence, social media algorithms, and digital healthcare applications in shaping public health behavior. Expanding research toward rural populations, marginalized communities, and

cross-cultural environments would provide broader insights into the global challenges of digital health transformation. Through continuous scholarly development, digital health literacy can become an essential foundation for strengthening preventive healthcare systems and promoting sustainable community well-being in the digital age.

LITERATURE REVIEW

The growing integration of digital technology into healthcare systems has transformed the way communities access, interpret, and utilize health information (Sul et al., 2023). Digital platforms, mobile health applications, telemedicine services, and social media communication channels increasingly influence individual decision-making processes related to disease prevention and health promotion. Within this context, digital health literacy has become an essential concept in understanding how individuals develop preventive health behavior in modern societies (Faizah et al., 2025). The literature concerning digital health literacy and preventive health behavior demonstrates that technological accessibility alone is insufficient to improve public health outcomes without adequate cognitive, social, and behavioral competencies (Steel et al., 2025). Therefore, this research employs three major theoretical perspectives, namely the Health Belief Model, Social Cognitive Theory, and Digital Health Literacy Theory, in order to establish a comprehensive conceptual framework explaining the relationship between digital health literacy and preventive health behavior among community populations.

The first theory employed in this study is the Health Belief Model (HBM), originally developed and popularized by Godfrey M. Hochbaum in 1958 at the United States Public Health Service, Washington D.C., United States (Kim & Kim, 2024). The Health Belief Model was subsequently refined by Irwin M. Rosenstock in 1966 at Harvard University, United States, and further expanded by Marshall H. Becker in the 1970s at the University of Michigan, United States. This theory explains that individual health behavior is influenced by personal perceptions regarding susceptibility to disease, severity of health threats, perceived benefits of preventive actions, and perceived barriers to behavioral change (Chong et al., 2024). According to Hochbaum, preventive behavior emerges when individuals believe that they are vulnerable to a particular health condition and perceive that preventive actions can effectively reduce health risks. Rosenstock emphasized that psychological readiness and health motivation significantly shape preventive healthcare decisions. Becker later developed the conceptual structure by integrating cues to action and self-efficacy as additional determinants influencing behavioral implementation.

The conceptual framework of the Health Belief Model is highly relevant to this research because digital health literacy directly affects how individuals perceive health risks and evaluate preventive healthcare information. Communities with higher digital health literacy are generally more capable of understanding online health warnings, recognizing disease prevention strategies, and assessing the credibility of digital medical information (Digwamaje & Tadi, 2024). Conversely, limited digital health literacy may weaken risk perception and reduce participation in preventive health practices such as vaccination, health screening, physical activity, and nutritional management. The contemporary development of the Health Belief Model demonstrates increasing adaptation toward digital health environments, particularly in studies examining online health campaigns, telemedicine engagement, and digital vaccination awareness programs (AP, 2025). Recent scholarly discussions indicate that digital information exposure now functions as an important cue to action influencing preventive healthcare behavior in technologically connected societies.

The second theory utilized in this research is Social Cognitive Theory (SCT), developed and popularized by Albert Bandura in 1986 at Stanford University, United States (Ahangar et al., 2023). Social Cognitive Theory explains that human behavior is shaped through reciprocal interactions between cognitive processes, environmental influences, and behavioral experiences. Bandura argued that individuals learn health-related behavior through observation, imitation, social interaction, and self-regulatory mechanisms. The theory emphasizes self-efficacy as a central determinant influencing behavioral adaptation and decision-making processes (Son & Han, 2025). According to Bandura, individuals with strong confidence in their abilities are more likely to engage in positive health behavior and maintain consistent preventive actions.

The theoretical contribution of Social Cognitive Theory to this study is particularly significant in understanding how digital environments shape community preventive behavior. Digital platforms expose individuals to various forms of health communication, including educational campaigns, public health messages, online testimonials, and peer-generated medical content. Through observational learning, communities may adopt preventive behavior by imitating trusted digital sources or influential social figures (Mulyani et al., 2025). Furthermore, digital health literacy strengthens self-efficacy because individuals who understand online health information are generally more confident in implementing preventive healthcare practices. Contemporary developments of Social Cognitive Theory increasingly incorporate digital interaction patterns, social media behavior, and online health communities as influential environmental determinants. Modern research demonstrates that digital social networks significantly shape public attitudes toward disease prevention, healthy lifestyles, and healthcare compliance (Biasio et al., 2024).

The third theory employed in this research is Digital Health Literacy Theory, widely popularized by Norman and Skinner through the concept of eHealth Literacy in 2006 at the University of Toronto, Canada (L. Zhang & Ding, 2025). Cameron D. Norman and Harvey A. Skinner introduced the Lily Model of eHealth Literacy, which explains that digital health literacy consists of six interrelated competencies, namely traditional literacy, health literacy, information literacy, scientific literacy, media literacy, and computer literacy (Parvanta et al., 2025). According to Norman and Skinner, effective utilization of digital health information requires not only technological access but also critical analytical skills enabling individuals to evaluate the credibility, relevance, and applicability of health information obtained through digital platforms.

The conceptual framework proposed by Norman and Skinner is central to this research because it directly explains the multidimensional competencies required for effective preventive health behavior in digital societies. Individuals with strong digital health literacy are better equipped to identify trustworthy health information, interpret medical guidance accurately, and avoid misinformation circulating through online environments (Chen et al., 2024). In contrast, populations with limited digital competencies may become vulnerable to misleading medical narratives, conspiracy theories, and inaccurate health practices. Contemporary developments in Digital Health Literacy Theory increasingly emphasize artificial intelligence, social media algorithms, telehealth systems, and digital healthcare accessibility as critical components influencing public health literacy. Recent studies also highlight that digital health literacy now extends beyond individual capability and includes social, ethical, and cultural dimensions affecting healthcare participation within community settings (Yan & Guo, 2024).

The integration of these three theories provides a comprehensive theoretical framework for understanding the primary problem examined in this research, namely the unequal level of digital health literacy and its influence on preventive health behavior among community populations. The Health Belief Model explains how digital information shapes perceptions of health risks and preventive motivation. Social Cognitive Theory clarifies the role of social interaction, observational learning, and self-efficacy within digital environments. Meanwhile, Digital Health Literacy Theory specifically addresses the competencies required to critically evaluate and utilize online health information. Collectively, these theories demonstrate that preventive health behavior is not solely determined by technological availability but also by psychological readiness, social influence, and literacy capacity (Robinson, 2025).

The research gap identified in previous literature further strengthens the relevance of these theories. Existing studies frequently analyze preventive health behavior from isolated perspectives without integrating digital literacy, cognitive perception, and social interaction simultaneously (Sukys et al., 2024). Some investigations focus predominantly on technological accessibility, while others examine behavioral determinants without considering the influence of digital information ecosystems. Consequently, there remains limited interdisciplinary understanding regarding how digital health literacy influences preventive healthcare behavior across diverse community populations. By combining the Health Belief Model, Social Cognitive Theory, and Digital Health Literacy Theory, this

research seeks to bridge these conceptual limitations and provide a multidimensional explanation regarding community preventive health behavior in the digital era.

The theoretical framework is also directly connected to the formulation of the research problem. The first research question regarding the influence of digital health literacy on preventive health behavior is explained through the relationship between literacy competencies and health decision-making processes. The second research question concerning socioeconomic and educational influences is linked to Social Cognitive Theory and Digital Health Literacy Theory, which emphasize environmental and educational determinants of behavioral capability. The third research question regarding the quality of digital information is associated with the Health Belief Model because inaccurate digital information may distort perceptions of health threats and preventive benefits (Nash et al., 2024).

The theories employed in this research also support the achievement of the study objectives and expected contributions. Theoretically, the integration of these frameworks contributes to interdisciplinary public health scholarship by connecting behavioral psychology, digital communication, and health literacy perspectives (Shao et al., 2025). Academically, the study enriches scientific discussion concerning the transformation of preventive healthcare behavior within digital societies and provides empirical references for future international public health research. Practically, the findings may assist policymakers, healthcare institutions, and educational organizations in developing more effective digital health promotion strategies, literacy interventions, and community-based preventive healthcare programs.

The contemporary relevance of these theories demonstrates that public health challenges in the digital age require multidimensional analytical approaches. Health information is no longer distributed exclusively through traditional medical institutions but increasingly mediated by digital networks, social platforms, and algorithmic systems (Mwogosi, 2025). Consequently, communities require not only access to healthcare services but also the ability to critically navigate complex digital information environments. The integration of psychological perception, social learning processes, and digital literacy competencies therefore becomes increasingly essential in strengthening preventive healthcare participation and reducing misinformation-related risks.

In conclusion, the literature review demonstrates that the Health Belief Model developed by Godfrey M. Hochbaum, refined by Irwin M. Rosenstock and Marshall H. Becker, Social Cognitive Theory developed by Albert Bandura, and Digital Health Literacy Theory introduced by Cameron D. Norman and Harvey A. Skinner collectively provide a strong theoretical foundation for analyzing digital health literacy and preventive health behavior among community populations (Gyulai et al., 2025). These theories explain the interaction between health perception, social influence, and digital literacy competencies in shaping preventive healthcare practices. The integration of the three theories addresses the primary research problem, bridges existing research gaps, and supports the novelty of the study through a multidimensional analytical framework. Furthermore, the theoretical synthesis contributes to the formulation of research questions, objectives, and theoretical, academic, and practical benefits, thereby strengthening the scientific relevance and contemporary significance of this research within international public health scholarship.

RESEARCH METHODS

This research employs a qualitative research methodology to comprehensively examine digital health literacy and its impact on preventive health behavior among community populations (Singla et al., 2025). The qualitative approach was selected because the study seeks to understand the social meanings, behavioral experiences, perceptions, and contextual realities associated with the use of digital health information in everyday preventive healthcare practices. Digital health literacy is not merely a technical competence related to accessing online information but also involves cognitive interpretation, social interaction, trust formation, and behavioral adaptation (Altunkurek et al., 2024). Therefore, a qualitative framework is considered the most appropriate methodological approach for exploring the complexity of individual and community experiences regarding digital health engagement. The qualitative paradigm enables researchers to investigate participants' perspectives in

depth and to interpret the sociocultural dynamics influencing preventive health behavior within contemporary digital environments.

The research design applied in this study is a qualitative case study design (Cho & Cho, 2025). The case study method was selected because it allows the researcher to conduct an intensive and contextualized examination of a particular social phenomenon within real-life community settings. The phenomenon investigated in this study concerns the relationship between digital health literacy and preventive health behavior among diverse community populations. The qualitative case study design provides flexibility in analyzing behavioral experiences, digital communication patterns, and health decision-making processes from multiple perspectives. This design also facilitates the exploration of contextual factors such as educational background, socioeconomic conditions, digital accessibility, and cultural influences that shape preventive healthcare behavior. The use of a case study design is highly relevant because preventive health behavior is deeply influenced by community interactions and digital information ecosystems that cannot be adequately measured through numerical indicators alone (Hwang et al., 2024).

The research was conducted in the urban and semi-urban community areas of Bandung Regency, West Java, Indonesia. The selection of this location was based on several academic and practical considerations. First, Bandung Regency represents a rapidly developing region experiencing significant growth in digital technology utilization and internet accessibility among community populations (Wickramasinghe, 2024). Second, the area demonstrates considerable diversity in educational attainment, socioeconomic conditions, occupational backgrounds, and healthcare access, thereby providing a comprehensive context for examining variations in digital health literacy. Third, preventive healthcare campaigns implemented by local healthcare institutions increasingly utilize digital communication platforms, making the region suitable for analyzing community interactions with digital health information. Fourth, despite improvements in technological infrastructure, disparities in digital literacy and healthcare understanding remain evident within several community groups, thus creating a relevant setting for investigating the influence of digital health literacy on preventive behavior. Consequently, Bandung Regency provides a representative social environment for understanding the opportunities and challenges associated with digital health transformation in developing community contexts.

The participants involved in this research consisted of community members, healthcare practitioners, public health officials, and community leaders who possessed direct experience related to digital health information and preventive healthcare practices. Since this study employs a qualitative methodology, the focus is not on statistical representativeness but rather on obtaining rich, contextual, and in-depth information from participants capable of explaining the phenomenon comprehensively (Boshnjaku et al., 2025). The study involved twenty participants selected through purposive sampling techniques. Purposive sampling was chosen because it enables the researcher to identify participants possessing relevant knowledge, experiences, and involvement concerning digital health literacy and preventive health behavior (Tabak et al., 2024).

The community participants included twelve individuals representing diverse demographic backgrounds, educational levels, and occupational categories. These participants were assigned pseudonyms in order to maintain confidentiality and ethical research standards (Melhem et al., 2023). The first participant, referred to as “Ms. Aulia,” is a 27-year-old elementary school teacher actively utilizing social media for health information access. She was selected because of her routine engagement with digital educational platforms and her involvement in community health campaigns. The second participant, “Mr. Bima,” is a 35-year-old motorcycle taxi driver who frequently accesses online health information through mobile applications. His inclusion was intended to represent informal sector workers experiencing varying levels of digital literacy. The third participant, “Mrs. Citra,” is a 42-year-old housewife participating in community healthcare programs and online parenting groups discussing preventive healthcare practices. She was selected to explore how family-oriented health decision-making is influenced by digital information exposure.

Additional participants included “Mr. Damar,” a university student utilizing telemedicine applications and online fitness platforms; “Mrs. Elina,” a small business owner actively following

digital nutrition and wellness campaigns; and “Mr. Fikri,” a retired civil servant representing older adults adapting to digital healthcare communication. Other community participants included agricultural workers, private employees, and youth community activists who regularly interacted with digital health content. The diversity of participants was intentionally designed to capture varying experiences, perceptions, and behavioral responses related to digital health literacy within community populations (Yongabi et al., 2024).

The research also involved five key informants selected based on their professional expertise and institutional involvement in public health promotion. The first key informant, identified as “Dr. Hana,” is a public health physician working at a community health center responsible for digital health education programs. She was selected because of her extensive experience in implementing preventive healthcare campaigns utilizing digital media. The second informant, “Mr. Irfan,” is a local government public health officer involved in community-based health literacy initiatives. His inclusion provided insights into governmental strategies related to digital health communication and preventive healthcare policies.

The third informant, “Ms. Jasmine,” is a digital media specialist working with healthcare awareness campaigns. She was selected to explain contemporary patterns of digital health communication and online information dissemination. The fourth informant, “Mrs. Karin,” is a community health volunteer coordinating local preventive healthcare activities and assisting residents in accessing digital health services. Her participation was important for understanding community-level challenges in digital health literacy implementation. The final informant, “Prof. Lestari,” is an academic researcher specializing in public health communication and digital literacy studies. She contributed theoretical and analytical perspectives concerning the broader implications of digital health literacy within preventive healthcare systems.

The selection of participants and informants was guided by several criteria. Participants were required to possess experience accessing digital health information through internet-based platforms such as social media, health websites, telemedicine services, or mobile healthcare applications. Informants were selected based on professional involvement in healthcare communication, community health promotion, or digital literacy development. The inclusion of diverse occupational and demographic categories aimed to strengthen data richness and enhance the comprehensiveness of thematic analysis (Sinha, 2023). Furthermore, participant diversity enabled the researcher to compare varying levels of digital literacy and preventive health behavior across different social contexts.

Data collection in this study employed multiple qualitative techniques consisting of in-depth interviews, participant observation, and document analysis (Mohammadi-Nasrabadi & Doustmohammadian, 2025). In-depth interviews were conducted to explore participants’ experiences, perceptions, and interpretations regarding digital health information and preventive healthcare behavior. Semi-structured interview guidelines were utilized to maintain flexibility while ensuring consistency with research objectives (Darabi et al., 2025). The interviews focused on several themes, including access to digital health information, trust in online healthcare sources, behavioral changes influenced by digital communication, challenges in evaluating information credibility, and preventive healthcare practices adopted by participants.

Participant observation was conducted within community health activities, digital literacy campaigns, and local healthcare promotion programs. Observation enabled the researcher to examine how individuals interacted with digital health content within social and community settings (An et al., 2023). This technique also facilitated understanding of communication dynamics, community participation patterns, and behavioral responses that might not be fully captured through interviews alone. Observational notes were systematically recorded to support thematic interpretation and contextual analysis.

Document analysis was additionally employed to strengthen research validity and triangulation processes (Pyo et al., 2023). Documents analyzed in this study included public health campaign materials, digital health education content, community healthcare reports, and government policy documents related to digital health literacy and preventive healthcare programs. The analysis of

these documents assisted in identifying institutional narratives, communication strategies, and policy frameworks influencing community health behavior.

The data analysis process utilized thematic analysis techniques. Thematic analysis was selected because it allows systematic identification, categorization, and interpretation of recurring patterns within qualitative data. The analysis process began with data transcription and repeated reading of interview transcripts, observation notes, and documentary materials. Subsequently, initial coding was conducted to identify meaningful statements related to digital health literacy and preventive healthcare behavior. Similar codes were then grouped into broader thematic categories reflecting key dimensions of the research problem.

The themes identified in this study included digital accessibility, information trustworthiness, preventive health awareness, social influence, self-efficacy, misinformation exposure, and behavioral adaptation. These themes were interpreted using the theoretical frameworks of the Health Belief Model, Social Cognitive Theory, and Digital Health Literacy Theory (Ahmadi & Karamitanha, 2023). The integration of theoretical perspectives strengthened analytical depth and enabled comprehensive interpretation regarding the relationship between digital literacy competencies and preventive healthcare practices.

To ensure research credibility and trustworthiness, the study employed triangulation, member checking, and prolonged engagement techniques (Wright et al., 2024). Triangulation was conducted by comparing information obtained from interviews, observations, and document analysis. Member checking involved confirming research interpretations with selected participants to ensure analytical accuracy and authenticity. Prolonged engagement within community settings enabled the researcher to develop deeper contextual understanding and reduce potential researcher bias.

Ethical considerations constituted an important component of the research methodology (Arwan, 2023). Participants and informants were informed regarding the objectives, procedures, confidentiality protections, and voluntary nature of their participation before interviews were conducted. Informed consent was obtained from all participants, and pseudonyms were utilized to maintain anonymity and protect personal identities. The research also ensured that data collection procedures respected participants' privacy, dignity, and sociocultural backgrounds.

The technique used for drawing research conclusions employed inductive reasoning combined with thematic interpretation (Z. Wang et al., 2023). Inductive analysis enabled the researcher to construct conceptual understanding based on empirical findings emerging from participant experiences and social realities. The conclusion process involved identifying relationships among themes, interpreting patterns within theoretical frameworks, and synthesizing findings into broader analytical explanations concerning digital health literacy and preventive healthcare behavior. Through inductive thematic interpretation, the research generated conclusions reflecting both empirical realities and theoretical relevance.

Overall, the qualitative case study methodology employed in this research provides a comprehensive framework for understanding how digital health literacy shapes preventive health behavior among community populations. The integration of diverse participants, multiple data collection techniques, and rigorous analytical procedures strengthens the credibility and academic quality of the study (Bruland et al., 2025). Furthermore, the methodological approach supports the achievement of the research objectives by enabling in-depth exploration of behavioral, social, and digital dimensions influencing preventive healthcare practices within contemporary community contexts.

RESULTS AND DISCUSSION

The findings of this research demonstrate that digital health literacy significantly influences preventive health behavior among community populations (Yang, 2024). The study revealed that individuals possessing higher levels of digital health literacy were more capable of identifying credible health information, understanding preventive healthcare recommendations, and implementing healthy behavioral practices in daily life. Conversely, participants with limited digital literacy

competencies frequently experienced confusion in evaluating online health information, resulting in uncertainty regarding preventive healthcare decisions (Kang et al., 2023). The findings also indicate that socioeconomic background, educational attainment, digital accessibility, and social interaction substantially affect the quality of digital health literacy among community members. These results confirm that preventive healthcare behavior in the digital era is shaped not only by access to technology but also by cognitive, social, and behavioral competencies.

The research identified several dominant themes associated with digital health literacy and preventive health behavior. These themes include accessibility to digital health information, trust in online healthcare sources, self-efficacy in preventive healthcare practices, misinformation exposure, social influence through digital communication, and behavioral adaptation toward healthier lifestyles (Philpot et al., 2024). The thematic analysis demonstrates that community members increasingly depend on digital platforms such as social media, healthcare applications, online medical websites, and telemedicine services for obtaining health-related information. However, the effectiveness of such information depends greatly on users' ability to critically interpret and validate the credibility of digital content.

The following table presents the major themes identified through thematic analysis.

Table

Table 1 Major Themes of Digital Health Literacy and Preventive Health Behavior among Community Populations

No	Major Themes	Key Findings
1	Accessibility to Digital Health Information	Participants frequently used smartphones, social media, and health applications to obtain preventive healthcare information
2	Information Credibility and Trust	Participants with higher digital literacy demonstrated stronger ability to distinguish valid and misleading health information
3	Preventive Health Awareness	Increased exposure to reliable digital information improved awareness regarding disease prevention and healthy lifestyles
4	Self-Efficacy in Health Behavior	Digitally literate participants showed greater confidence in implementing preventive healthcare practices
5	Social Influence and Online Communities	Online social interaction influenced preventive behavior through peer recommendations and observational learning
6	Exposure to Health Misinformation	Limited digital literacy increased vulnerability to inaccurate medical information and conspiracy narratives
7	Behavioral Adaptation	Participants with strong digital literacy adopted healthier preventive practices more consistently

The results indicate that the primary research problem concerning unequal digital health literacy among community populations remains highly relevant within contemporary healthcare systems. Several participants reported that although internet access was widely available, many individuals lacked the critical analytical skills necessary to evaluate the reliability of digital health information (Bertani, 2024). This condition contributed to confusion regarding preventive healthcare recommendations, particularly during public health campaigns involving vaccination, nutrition management, and disease prevention strategies. Participants with stronger educational backgrounds generally demonstrated higher digital health literacy and greater participation in preventive healthcare practices compared to individuals with lower educational attainment (Li et al., 2023).

These findings strongly correspond with the Health Belief Model developed by Godfrey M. Hochbaum and further refined by Irwin M. Rosenstock and Marshall H. Becker (Burkhardt et al., 2025). The study revealed that participants who perceived themselves as vulnerable to health risks were more motivated to seek digital health information and implement preventive healthcare behavior. Digital health literacy influenced participants' perceptions of disease susceptibility, perceived severity, perceived benefits of preventive action, and perceived barriers to behavioral change. For example, participants who understood reliable online health information were more likely to participate in vaccination programs, maintain healthy diets, and engage in regular physical activity. In contrast, participants exposed to misinformation frequently perceived preventive measures as unnecessary or ineffective.

The findings also support Social Cognitive Theory introduced by Albert Bandura (X. Zhang et al., 2024). The study demonstrated that social interaction through digital platforms significantly influenced preventive health behavior. Participants frequently learned preventive healthcare practices through online observation, peer communication, and digital social networks. Community members often imitated health behaviors promoted by trusted healthcare professionals, influencers, and online peer groups. Participants with higher self-efficacy were more confident in implementing preventive healthcare practices after obtaining reliable digital health information. Conversely, individuals with limited self-confidence frequently avoided engaging in preventive healthcare activities despite having access to digital information.

Furthermore, the results strongly reinforce Digital Health Literacy Theory proposed by Cameron D. Norman and Harvey A. Skinner (Tankova, 2025). The findings reveal that digital health literacy encompasses more than technological competence. Participants who demonstrated strong information literacy, scientific understanding, and media literacy were better equipped to critically evaluate online health information and avoid misinformation. Individuals possessing comprehensive digital literacy competencies were more capable of utilizing telemedicine applications, interpreting healthcare recommendations, and verifying the credibility of digital medical sources. These findings confirm that preventive healthcare effectiveness in digital societies depends heavily on multidimensional literacy capacities.

The implementation of these theoretical perspectives within community healthcare contexts demonstrates the importance of integrating digital literacy programs into preventive healthcare policies (Guo et al., 2025). The Health Belief Model emphasizes the need to strengthen public perception regarding health risks and preventive benefits through credible digital communication. Social Cognitive Theory highlights the significance of positive online social environments and role modeling in shaping preventive healthcare behavior. Meanwhile, Digital Health Literacy Theory underlines the necessity of developing critical digital competencies enabling communities to navigate complex information ecosystems responsibly.

The findings also address the research gap identified in previous literature. Earlier studies frequently examined digital health literacy from technological perspectives without sufficiently exploring behavioral and sociocultural dimensions (White et al., 2025). This research demonstrates that digital health literacy operates through interconnected cognitive, social, and environmental processes influencing preventive healthcare behavior. Unlike prior studies focusing predominantly on urban or highly educated populations, this study included participants from diverse educational and occupational backgrounds, thereby providing broader understanding regarding community-based digital health literacy challenges.

The following table presents the relationship between digital health literacy and preventive health behavior identified during the study.

Table

Table 2 Relationship between Digital Health Literacy and Preventive Health Behavior

Digital Health Literacy Indicators	Preventive Health Behavior Outcomes
Ability to evaluate information credibility	Increased participation in vaccination and health screening
Understanding digital medical guidance	Improved nutritional and hygiene practices
Access to reliable health applications	Enhanced preventive healthcare awareness
Media literacy competency	Reduced susceptibility to misinformation
Self-efficacy in digital information use	Stronger consistency in healthy lifestyle adoption
Participation in digital health communities	Increased engagement in preventive healthcare activities

The results further demonstrate that participants frequently relied on digital healthcare platforms for obtaining preventive healthcare recommendations. Telemedicine applications, online healthcare forums, and social media campaigns became important sources of health information, particularly among younger participants (Mixon et al., 2025). However, older participants often encountered difficulties understanding digital medical terminology and navigating healthcare applications. This finding highlights persistent inequalities in digital health literacy among community populations.

The discussion of these findings aligns with previous international studies examining digital health literacy and preventive healthcare behavior. Research conducted by Norman and Skinner emphasized that individuals possessing stronger eHealth literacy competencies are more capable of implementing effective health decision-making processes (Kusuma & Darmawati, 2025). Similarly, Bandura's research regarding self-efficacy demonstrated that confidence in behavioral capability strongly influences preventive healthcare participation. Studies based on the Health Belief Model also consistently indicate that health behavior is significantly shaped by perceptions regarding susceptibility and preventive benefits.

Nevertheless, this research extends previous scholarly findings by demonstrating that digital health literacy operates within broader social and cultural contexts. Community interaction, educational inequality, and digital accessibility collectively influence preventive healthcare behavior (Hamwi et al., 2024). Participants frequently discussed how family members, community leaders, and online peer groups affected their interpretation of digital health information. This demonstrates that preventive health behavior in digital societies cannot be understood solely through individual cognitive frameworks but must also consider collective social influences.

The findings additionally respond to the research questions formulated at the beginning of the study. The first research question examined how digital health literacy influences preventive health behavior among community populations. The results clearly demonstrate that individuals possessing higher digital literacy competencies are more likely to engage in positive preventive healthcare practices. The second research question investigated the influence of socioeconomic and educational factors on digital health literacy. The findings reveal that educational attainment and digital accessibility significantly shape participants' ability to evaluate and utilize health information (Dickens et al., 2025). The third research question concerned the role of information quality in preventive healthcare participation. The results indicate that misinformation exposure negatively affects preventive healthcare behavior, particularly among participants with limited digital literacy skills.

The implementation of the three theoretical frameworks provides comprehensive explanation regarding these findings. The Health Belief Model explains how digital information shapes perceptions of health risks and preventive motivation. Social Cognitive Theory clarifies the influence of observational learning, social interaction, and self-efficacy within digital environments. Digital

Health Literacy Theory specifically explains the competencies required for critically interpreting and applying online health information. The integration of these theories therefore strengthens the conceptual understanding of preventive healthcare behavior within contemporary digital societies (Prasad & Forsyth, 2024).

The findings also support the achievement of the research objectives. The first objective sought to analyze the influence of digital health literacy on preventive healthcare behavior. The results confirm that digital literacy significantly affects behavioral adaptation toward healthier lifestyles. The second objective aimed to identify factors influencing digital health literacy. The findings demonstrate that education, social interaction, technological accessibility, and media exposure collectively shape literacy competencies. The third objective concerned the development of conceptual understanding regarding digital health literacy within preventive healthcare systems. The integration of empirical findings and theoretical perspectives successfully provides a multidimensional framework explaining preventive healthcare behavior in digital communities.

The theoretical benefits of this research are substantial. The findings contribute to interdisciplinary public health scholarship by integrating behavioral psychology, social learning theory, and digital literacy perspectives (Zimmerman et al., 2025). Previous studies frequently examined these concepts separately, whereas this research demonstrates their interconnected influence within preventive healthcare behavior. The findings also enrich theoretical discussion concerning the transformation of healthcare communication in digital societies and provide broader conceptual understanding regarding contemporary health behavior dynamics.

Academically, this study contributes empirical evidence supporting future international research concerning digital health literacy and community healthcare transformation. The research provides valuable references for scholars examining health communication, digital literacy, behavioral health psychology, and preventive healthcare systems. The inclusion of diverse community participants additionally strengthens the academic relevance of the findings by presenting contextual insights regarding digital health inequalities within developing social environments.

Practically, the findings provide important implications for policymakers, healthcare institutions, and educational organizations (Lohani et al., 2023). The study demonstrates the necessity of developing community-based digital health literacy programs emphasizing critical information evaluation and preventive healthcare awareness. Healthcare institutions may utilize these findings to improve digital communication strategies and strengthen public trust toward online health information. Educational institutions may also integrate digital health literacy into community education programs in order to reduce vulnerability to misinformation and improve preventive healthcare participation.

The findings additionally reveal several implementation challenges associated with digital healthcare transformation. Participants frequently expressed concerns regarding the overwhelming volume of online health information and difficulties identifying scientifically valid sources (Restini et al., 2024). Older adults and individuals with limited educational backgrounds experienced greater challenges navigating digital healthcare platforms. These findings indicate that technological advancement alone cannot guarantee effective preventive healthcare participation without adequate literacy support and inclusive educational interventions.

The following table summarizes the implications of the findings for theory and practice.

Table

Table 3. Theoretical and Practical Implications of the Research Findings

Aspect	Implications
Health Belief Model	Digital information influences perceptions of health risks and preventive benefits
Social Cognitive Theory	Online social interaction shapes behavioral learning and self-efficacy
Digital Health Literacy Theory	Critical digital competencies determine preventive healthcare effectiveness
Public Health Policy	Community-based digital literacy programs are necessary
Healthcare Institutions	Improved digital communication strategies enhance preventive participation
Educational Programs	Digital literacy education reduces misinformation vulnerability

The discussion of these findings further confirms the novelty of the research. Unlike previous studies focusing primarily on technological accessibility or isolated behavioral outcomes, this study demonstrates that preventive healthcare behavior is influenced by multidimensional interactions involving literacy competencies, social influence, psychological perception, and environmental conditions (Sim & Wong, 2023). The integration of the Health Belief Model, Social Cognitive Theory, and Digital Health Literacy Theory provides a broader analytical framework capable of explaining contemporary preventive healthcare behavior more comprehensively.

The findings also reinforce previous international research indicating that misinformation exposure constitutes a major public health challenge within digital societies (Naef et al., 2024). However, this study expands previous discussions by emphasizing the importance of community-level social interaction and cultural context in shaping digital health literacy. Participants frequently relied on trusted social networks and community recommendations when evaluating online health information. Consequently, effective digital health promotion strategies must incorporate not only technological interventions but also social and cultural engagement mechanisms.

In conclusion, the results and discussion demonstrate that digital health literacy significantly affects preventive health behavior among community populations (Bhowmik et al., 2025). Individuals possessing stronger digital literacy competencies exhibit greater capacity to evaluate online health information, avoid misinformation, and implement preventive healthcare practices consistently. The findings confirm the relevance of the Health Belief Model, Social Cognitive Theory, and Digital Health Literacy Theory in explaining preventive healthcare behavior within digital societies. The research also addresses existing literature gaps by integrating cognitive, behavioral, social, and technological perspectives into a comprehensive analytical framework. Furthermore, the study contributes theoretical, academic, and practical benefits by providing evidence-based insights supporting community-based digital health literacy development and preventive healthcare transformation in contemporary public health systems.

CONCLUSION

The conclusion of this research demonstrates that digital health literacy plays a fundamental role in shaping preventive health behavior among community populations within contemporary digital societies. The findings confirm that individuals possessing stronger digital health literacy

competencies are more capable of accessing, understanding, evaluating, and applying health information obtained through digital platforms in order to support preventive healthcare practices. Communities with adequate digital literacy demonstrated greater awareness regarding disease prevention, healthier lifestyle adaptation, and stronger participation in preventive healthcare activities such as vaccination, nutritional management, physical exercise, personal hygiene maintenance, and routine medical consultation. Conversely, individuals with limited digital literacy competencies frequently experienced difficulties identifying credible online health information, thereby increasing vulnerability to misinformation, inaccurate medical interpretation, and ineffective preventive healthcare behavior.

The research findings indicate that preventive healthcare behavior is influenced not solely by technological accessibility but also by cognitive, social, and behavioral capacities associated with digital information utilization. Although most participants possessed access to smartphones and internet-based healthcare information, substantial differences remained regarding their ability to critically interpret digital health content. Participants with higher educational backgrounds and broader digital exposure generally demonstrated greater confidence in evaluating online healthcare information and implementing preventive health practices consistently. In contrast, participants characterized by limited educational attainment and insufficient digital literacy frequently relied on unverified information sources, resulting in uncertainty and misconceptions regarding preventive healthcare recommendations. These findings confirm that digital inequality continues to influence healthcare participation within community populations.

The results and discussion further reveal that social interaction significantly affects preventive health behavior in digital environments. Online communities, peer communication, healthcare influencers, and social media campaigns contributed substantially to shaping participants' perceptions regarding health risks and preventive healthcare actions. The findings demonstrate that preventive healthcare behavior frequently develops through observational learning and social influence within digital communication networks. Participants commonly adopted health-related practices after observing recommendations from trusted healthcare professionals, family members, or online social groups. This condition illustrates that digital healthcare behavior is not exclusively determined by individual cognition but also by social interaction and collective community dynamics.

The research additionally confirms the relevance and applicability of the three theoretical frameworks employed in this study. The Health Belief Model successfully explains how digital health information influences participants' perceptions concerning susceptibility to disease, perceived severity of health threats, benefits of preventive action, and barriers to healthcare participation. Individuals possessing stronger digital literacy were more likely to perceive preventive healthcare measures as beneficial and necessary for maintaining personal and community health. Social Cognitive Theory also proved highly relevant in explaining the influence of online social interaction, observational learning, and self-efficacy on preventive health behavior. Participants demonstrating higher self-confidence in utilizing digital health information showed stronger commitment toward preventive healthcare practices. Meanwhile, Digital Health Literacy Theory effectively clarified the multidimensional competencies required for navigating digital health environments responsibly, including media literacy, information evaluation, and scientific understanding.

The findings of this research also address the primary research problem concerning unequal digital health literacy among community populations. The study demonstrates that disparities in literacy competencies significantly affect individuals' capacities to engage in preventive healthcare behavior. Communities characterized by limited digital understanding were more vulnerable to misinformation exposure and less likely to participate actively in preventive healthcare initiatives. Consequently, the study highlights the importance of strengthening community-based digital health literacy programs capable of improving critical thinking skills, information verification capacity, and preventive healthcare awareness.

Furthermore, this research successfully addresses the research gap identified in previous literature. Earlier studies frequently focused on technological accessibility or isolated behavioral dimensions without comprehensively integrating psychological, social, and literacy-related

determinants of preventive healthcare behavior. This study contributes a multidimensional analytical framework by combining the Health Belief Model, Social Cognitive Theory, and Digital Health Literacy Theory in order to explain preventive healthcare behavior within digital societies more comprehensively. The integration of these theories provides broader understanding regarding the interaction between digital information, behavioral motivation, social influence, and literacy competencies within community healthcare contexts.

The study also fulfills its research objectives by demonstrating the significant relationship between digital health literacy and preventive health behavior among community populations. The findings identify education, social interaction, and digital accessibility as important factors influencing literacy competencies and preventive healthcare participation. In addition, the study develops a conceptual understanding regarding the importance of digital literacy within sustainable public health systems. Through the integration of empirical findings and theoretical interpretation, the research contributes important theoretical, academic, and practical implications for contemporary healthcare development.

Theoretically, this research enriches interdisciplinary public health scholarship by integrating behavioral psychology, social learning perspectives, and digital literacy studies into a unified analytical framework. Academically, the study provides empirical evidence that may support future international research concerning digital healthcare transformation and preventive health communication. Practically, the findings offer important recommendations for policymakers, healthcare institutions, and educational organizations in developing inclusive digital health literacy interventions capable of reducing misinformation vulnerability and strengthening preventive healthcare participation among communities.

Overall, the research concludes that digital health literacy constitutes an essential foundation for improving preventive healthcare behavior in contemporary societies. Effective public health transformation in the digital era requires not only technological advancement but also comprehensive literacy development, social engagement, and evidence-based healthcare communication strategies. Strengthening digital health literacy among community populations therefore becomes a critical component in promoting healthier societies, reducing healthcare inequalities, and supporting sustainable preventive healthcare systems in the future.

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