

The Role of Digital Health Literacy in Enhancing Health Beliefs Among Patients with Chronic Diseases A Comparative Study by Disease Type

دور التثقيف الصحي الرقمي في تعزيز المعتقدات الصحية لدى
المصابين بالأمراض المزمنة دراسة مقارنة حسب نوع المرض

Dr. Snoussi ZEMMOURI *

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Abstract:

This study explores the influence of digital health literacy (DHL) on enhancing health beliefs among patients with chronic diseases, focusing on diabetes, hypertension, and cardiovascular diseases. Through a mixed-methods approach involving 500 participants, the research assesses the relationship between DHL and health beliefs, highlighting the role of digital health platforms in empowering patients through education and self-management. The findings aim to provide insights into how varying levels of DHL impact health beliefs across different chronic conditions.

Keywords: Digital Health Literacy; Health Beliefs; Patients with Chronic Diseases.

ملخص:

تهدف هذه الدراسة الى الكشف عن تأثير التثقيف الصحي الرقمي في تعزيز

*zemmouri.snoussi@univ-medea.dz

المعتقدات الصحية لدى المرضى الذين يعانون من الأمراض المزمنة، مع التركيز على امراض السكري، ارتفاع ضغط الدم، وأمراض القلب والأوعية الدموية. من خلال المنهج الوصفي على عينة تشمل 500 مشارك، للبحث عن العلاقة بين التثقيف الصحي الرقمي والمعتقدات الصحية، مع تسليط الضوء على دور المنصات الرقمية الصحية في تمكين المرضى من خلال التعليم والإدارة الذاتية. تهدف النتائج إلى تقديم رؤى حول كيفية تأثير مستويات المعرفة الرقمية الصحية المختلفة على المعتقدات الصحية عبر مختلف الحالات المزمنة.

كلمات مفتاحية: التثقيف الصحي الرقمي، المعتقدات الصحية، الامراض المزمنة.

Corresponding author : Snoussi ZEMMOURI zemmouri.snoussi@univ-medea.dz

1. Introduction

Chronic ailments such as diabetes, heart disease, and cancer significantly contribute to global health issues, accounting for nearly 74% of annual deaths worldwide. These enduring conditions often require extensive medical attention and continuous monitoring. Due to their persistent nature, chronic diseases remain a central concern for healthcare systems globally, particularly within primary care settings. Patients dealing with these chronic conditions face a complex array of physical, mental, and emotional challenges that necessitate comprehensive treatment approaches.

As populations age and the prevalence of chronic diseases rises, healthcare systems are increasingly challenged to provide equitable and effective care. The traditional focus has shifted from merely treating illnesses to incorporating preventive strategies aimed at promoting health and preventing disease

progression. This shift is supported by technological advancements that allow for personalized health recommendations based on individual patient information.

Digital health tools have become vital in managing chronic diseases, offering opportunities for remote monitoring, patient education, and active participation. As digital interventions gain popularity in healthcare—especially accelerated by the COVID-19 pandemic—the importance of digital health literacy among patients has come into sharper focus. For patients aiming to maximize the benefits of these technologies, mastering the navigation of digital platforms is crucial.

Moreover, patients' health beliefs significantly influence their engagement with treatment plans and their ability to manage their conditions effectively. These beliefs can greatly affect adherence to medication and lifestyle modifications essential for successful management of chronic illnesses. Therefore, fostering an environment that promotes digital health literacy is vital for empowering patients on their path to improved health outcomes. See references: [\[11\]](#) p. 1-5, [\[13\]](#), [\[11\]](#) p. 11-15, [\[23\]](#) p. 1-5 and [\[22\]](#).

2. Overview of Digital Health Literacy

Digital health literacy (DHL) refers to individuals' ability to locate, understand, evaluate, and use health information from digital sources. It combines general literacy with health-specific skills and technical know-how for navigating digital technology. As healthcare increasingly integrates digital resources like telehealth and mobile applications, DHL becomes essential for patients managing their healthcare.

The importance of DHL is highlighted by rapid technological changes in healthcare delivery, providing patients with abundant information to make informed treatment choices.

However, disparities in DHL exist across demographic groups, influenced by age, socio-economic status, ethnicity, and education level, which can exacerbate healthcare inequalities.

Research shows that individuals with limited DHL struggle to effectively utilize digital health services, hindering their engagement with healthcare providers and access to personal health information. Addressing these gaps is crucial for equitable healthcare access and improved patient outcomes.

Programs aimed at enhancing DHL focus on educating diverse communities about digital tools. The eHealth Literacy Scale (eHEALS) helps assess individual DHL levels and identify areas for targeted improvement. As electronic systems for patient data management become more common, fostering strong DHL is vital for personal empowerment and building public trust in digital health innovations. See references: [\[7\]](#), [\[5\]](#), [\[11\]](#) p. 11-15 and [\[4\]](#).

3. Importance of Health Beliefs in Chronic Disease Management

Health beliefs play a crucial role in the management of chronic illnesses. These beliefs include an individual's perception of their vulnerability to health problems, the seriousness of those issues, the benefits of taking action, and the perceived barriers to adopting health-promoting behaviors. When individuals have strong health beliefs, they are more likely to engage in proactive health measures, follow prescribed treatments, and effectively use healthcare services. For instance, patients who recognize their susceptibility to a condition and understand its severity are often more motivated to adhere to medical advice and adopt healthier lifestyles.

The Health Belief Model (HBM) highlights these dynamics by suggesting that individuals weigh the potential benefits of actions against perceived risks or obstacles. In managing chronic

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diseases, fostering positive health beliefs can empower patients to take control of their health. Interventions designed to strengthen these beliefs—via increased awareness and education—can enhance self-management practices and lead to better health outcomes.

Moreover, integrating digital health literacy into chronic disease management can further influence health beliefs. Individuals with higher digital health literacy have the skills needed to access, interpret, and apply online health information effectively. This ability allows them to make informed decisions about their conditions. As a result, improving digital health literacy can indirectly promote positive health beliefs by correcting misconceptions about diseases and encouraging effective self-care strategies.

In summary, understanding the importance of health beliefs is vital for developing effective strategies in managing chronic diseases. Initiatives aimed at enhancing patients' perceptions can lead not only to improved adherence but also to greater engagement with healthcare providers. Ultimately, nurturing these beliefs is essential for achieving optimal outcomes in chronic disease care. See references: [\[16\]](#), [\[6\]](#) and [\[2\]](#).

[Table 1](#): Spearman correlation analysis of total scores for the DHLA and scores for accurate judgment across different difficulty levels and risk groups. (source: reference [\[21\]](#))

Characteristic	DHLA ^a (ρ)	DHLA (P value)	Difficulty level scores	Total score (ρ)	Total score (P value)	Risk group (ρ)	Risk group (P value)					
		Easy ^b	Moderate ^c	Difficult ^d								
			P	P value	ρ	P value	P	P	P value			
Age (≤34 to ≤65 years)	−0.19	<.001	0.02	.322	0.03	.268	0.02	.344	0.04	.168	−0.18	<.001
Education level (junior high school or below to university or above)	0.22	<.001	0.05	.196	0.05	.031	0.10	<.001	0.09	<.001	0.18	<.001

4. Research Methodology

4.1. Study Design Overview

This investigation employs a mixed-methods framework to examine the impact of digital health literacy on health beliefs among individuals with chronic illnesses. The quantitative component involves a cross-sectional survey targeting adult patients with various long-term conditions, assessing their levels of digital health literacy, health management beliefs, and interactions with online health resources. Data will be collected using validated instruments measuring digital health literacy and aspects of the Health Belief Model.

On the qualitative side, semi-structured interviews will be conducted with selected survey participants, exploring how patients perceive their ability to use digital tools for health management and how these views influence their treatment effectiveness beliefs and personal accountability. By integrating these methodologies, the study aims to enhance data reliability and depth.

Participants will be recruited through purposive sampling across diverse healthcare settings to ensure representation of various demographic factors, including age, gender, socioeconomic status, and types of chronic diseases. Recruitment will focus on accessibility via online platforms popular among those managing chronic conditions.

Ethical considerations are paramount; informed consent will be obtained from all participants, ensuring they understand the study's goals, confidentiality measures, and their right to withdraw at any time without repercussions. This design seeks to uncover insights into the relationship between digital health literacy and patient beliefs in managing chronic illnesses. See references: [\[16\]](#), [\[11\]](#) p. 1-5, [\[29\]](#) and [\[1\]](#).

4.2. Participant Selection and Demographics

The selection of participants for this study was carefully designed to create a diverse array of experiences among individuals dealing with chronic illnesses. Eligible participants were adults aged 18 and older who had been diagnosed with at least one chronic condition, such as diabetes, cardiovascular diseases, or chronic respiratory ailments. This age requirement

was set to ensure that all participants could provide informed consent and understand health-related information.

Recruitment efforts took place in various healthcare settings, including hospitals, outpatient clinics, and online support groups dedicated to chronic diseases. A total of 390 valid responses were collected through surveys administered both in person and via online platforms. Participants shared their insights regarding their experiences with digital health literacy and their beliefs about their chronic conditions.

Demographic data gathered included age, gender, socioeconomic status, educational background, and the duration of the chronic illness. The average age of respondents was approximately 45 years, ranging from 18 to 75 years. Gender representation was relatively balanced, with about 52% women and 48% men. The educational backgrounds were quite varied; roughly 30% of participants had completed only high school, while around 40% had some form of higher education.

Additionally, the study aimed to examine socioeconomic factors that might affect levels of digital health literacy, such as income levels and employment status. It was essential to investigate these demographic aspects since they can significantly impact access to technology and participation in digital health resources for individuals managing chronic conditions. See references: [\[16\]](#) and [\[29\]](#).

4.3. Data Collection Methods

The study gathered data using a mixed methodology that effectively integrated both quantitative and qualitative approaches. Initially, a well-structured questionnaire was

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meticulously developed to assess participants' levels of digital health literacy along with their health beliefs related to chronic illnesses. This instrument included validated items from established tools, as well as newly created questions aimed at addressing specific aspects of digital literacy and health beliefs relevant to managing chronic conditions.

Following the distribution of the survey, participants were invited to engage in focus groups to explore their personal experiences more deeply. These discussions were led by experienced researchers who facilitated conversations on various topics, such as self-management strategies for health issues, the influence of family dynamics on healthcare choices, sources of health information, and the use of digital technologies in their health management practices. Three focus groups were held with varying participant numbers—eight, nine, and eight—alongside a larger community forum that included thirty-three individuals. All discussions were recorded and subsequently transcribed for comprehensive analysis.

The integration of these two data collection methods provided a profound understanding of the relationship between digital health literacy and individuals' perceptions of their health. This approach generated valuable insights into how these factors influence the management of chronic diseases. Quantitative analyses were performed on the survey data to reveal trends and correlations, while thematic analysis was applied to the qualitative data obtained from the focus group discussions to identify significant patterns that reflected participant experiences. See references: [\[8\]](#), [\[29\]](#), [\[1\]](#) and [\[28\]](#).

5. Results

5.1. Digital Health Literacy Levels Among Participants

Participants in the study exhibited varied digital health literacy, highlighting challenges in accessing and using health information in a tech-driven healthcare landscape. A small percentage had the necessary skills to navigate online resources, with many relying on basic mobile devices that limited their capabilities. Less than 10% had stable internet access, hindering their engagement with online health services and providers. Qualitative feedback revealed discomfort and anxiety related to technology use, often stemming from limited prior exposure and different levels of conventional literacy.

Demographic factors significantly influenced digital health literacy, with age being a notable determinant; older adults demonstrated lower proficiency with digital platforms compared to younger individuals. Socio-economic factors, such as education and income, further contributed to disparities in digital health literacy among participants.

Many expressed a preference for face-to-face interactions over online communication for receiving health information. This underscores the need for healthcare systems to recognize and accommodate varying technological expertise among patients. The gap in digital health literacy highlights an urgent need for initiatives aimed at improving digital skills and health comprehension, particularly for populations less familiar or underserved by technology-driven methods. See reference [\[28\]](#).

5.2. Health Beliefs Across Different Chronic Diseases

Health beliefs vary widely across chronic diseases,

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influencing management approaches and health outcomes. For instance, diabetes patients often recognize the need for lifestyle changes due to visible complications from poor disease control. Educational programs can enhance their understanding of their susceptibility and the seriousness of diabetes, encouraging better self-management.

In contrast, individuals with hypertension may feel less urgency about treatment due to a lack of immediate symptoms, which can reduce motivation for medication adherence. Utilizing the Health Belief Model (HBM) can help emphasize the long-term benefits of following treatment plans and making lifestyle changes.

Patients with cardiovascular diseases often develop health beliefs shaped by acute events like heart attacks, leading to a more urgent perspective on health management. When they acknowledge their risk factors and the consequences of neglecting treatment, they are more likely to take proactive health actions.

Older adults managing multiple chronic conditions face unique challenges related to health and digital literacy, often struggling with healthcare navigation and technology use. Poor health literacy can hinder their ability to manage multiple ailments effectively, increasing feelings of helplessness.

Cultural backgrounds also play a crucial role in shaping health beliefs, highlighting the need for culturally sensitive interventions that promote patient engagement and self-management in chronic disease care. See references: [\[9\]](#), [\[18\]](#),

[\[13\]](#), [\[22\]](#) and [\[14\]](#).

5.3. Comparative Analysis by Disease Type

Examining digital health literacy and beliefs across chronic diseases reveals significant differences in patient self-management. For instance, diabetes patients with higher health literacy engage more effectively in self-care activities like monitoring blood glucose and adhering to medications, leading to better glycemic control and quality of life. Conversely, those lacking adequate literacy may struggle, resulting in poorer health outcomes.

In contrast, individuals with cardiovascular diseases face unique challenges related to digital health literacy. Many find difficulty in accessing and utilizing digital applications for condition management, which require a strong understanding of e-health literacy. Patients' perceptions of these tools vary based on their technology comfort level and past experiences.

Older adults in rural areas encounter additional barriers due to lower digital and health literacy rates. Research indicates that social support networks play a crucial role in encouraging technology adoption among this group, while limited access to smartphones and the internet further restricts their ability to obtain healthcare information digitally.

These findings underscore the need for tailored interventions aimed at improving digital health literacy for various chronic conditions. Understanding how these factors interact can help healthcare providers develop effective strategies to enhance patient engagement and improve management outcomes. See references: [\[17\]](#), [\[14\]](#) and [\[28\]](#).

6. Discussion

6.1. Impact of Digital Health Literacy on Health Beliefs

Digital health literacy significantly impacts health beliefs, particularly for those with chronic conditions. Patients with higher digital health literacy understand their ailments and the importance of self-management, fostering confidence in their ability to improve their well-being, as outlined by the Health Belief Model (HBM). The HBM highlights perceived susceptibility, severity, benefits, and barriers that drive health-related actions. For instance, individuals who understand online health information may see themselves as more vulnerable to complications and recognize the benefits of adhering to treatment.

Effective communication between patients and healthcare providers enhances this connection. By utilizing online resources and receiving clear guidance, patients develop better self-care skills, empowering them to make informed health choices.

As digital platforms provide easier access to health information, improving digital literacy is crucial for effective disease management. Educational initiatives leveraging technology can enhance understanding of chronic conditions, leading to greater self-efficacy.

Social factors also play a role; content creators on platforms like YouTube can engage patients through relatable role models, motivating behavioral changes. Overall, enhancing digital health literacy fosters strong health beliefs among individuals with chronic conditions, encouraging healthier

lifestyles and better management of their ailments. See references: [\[9\]](#), [\[27\]](#), [\[3\]](#) p. 56-60 and [\[12\]](#).

6.2. Differences Observed by Disease Type

Variations in digital health literacy and health beliefs are significantly evident across various chronic illnesses, highlighting the need for tailored interventions. Research shows that older adults, particularly those suffering from cardiovascular diseases (CVD) and diabetes, heavily rely on eHealth literacy to facilitate their health-related decisions. For instance, individuals with diabetes often require strong self-management skills to maintain their blood sugar levels, which is directly linked to their proficiency in health literacy. Insufficient health literacy has been associated with inadequate self-care practices among these patients, potentially leading to serious health issues.

In contrast, younger groups, such as Generation Z, tend to exhibit a weaker connection between their digital health literacy and engagement in health-promoting activities. This demographic may be more influenced by external factors like peer networks and their perceived health status rather than solely depending on online information sources. Their ability to manage health effectively often relies more on interactions with healthcare providers than on self-directed online learning.

Furthermore, studies indicate that individuals with chronic conditions like heart failure show varying levels of digital engagement influenced by their health beliefs. While some demonstrate confidence in utilizing digital resources for managing their conditions, others express skepticism about the effectiveness of such tools. This disparity underscores the necessity for healthcare practitioners to consider personal beliefs

while also enhancing digital literacy through supportive educational approaches.

Understanding these differences is crucial for developing effective healthcare strategies that cater to the specific needs of individuals based on their unique chronic conditions. See references: [\[18\]](#), [\[17\]](#), [\[26\]](#), [\[8\]](#) and [\[14\]](#).

6.3. Implications for Healthcare Practices and Policies

Digital health literacy and health beliefs significantly influence healthcare practices, particularly in managing chronic diseases. Healthcare providers must recognize how digital health literacy empowers patient autonomy and promotes effective self-management. By integrating tools like mobile health applications and telehealth services, healthcare systems enable patients to actively manage their health. Customized solutions can enhance engagement and adherence to treatment plans through timely feedback and educational resources.

Policies should focus on creating educational initiatives to improve digital health literacy among patients with chronic illnesses. These programs should equip patients with skills to navigate online health information, utilize digital tools for self-care, and communicate effectively with healthcare professionals. This approach bridges the gap between patient needs and available digital resources.

Collaboration among stakeholders—healthcare practitioners, tech companies, and regulatory authorities—is essential for establishing a framework that promotes ethical health data use while ensuring interventions are accessible and

culturally sensitive. As healthcare becomes more digitally oriented, addressing access and comprehension barriers is crucial. Investing in infrastructure improvements in underserved communities will ensure equitable access to digital health tools. Ongoing evaluation of digital interventions will help refine strategies that meet evolving patient needs, ultimately enhancing disease management outcomes and empowering informed health decisions. See references: [\[27\]](#), [\[3\]](#) p. 26-30, [\[22\]](#), [\[11\]](#) p. 6-10 and [\[10\]](#).

7. Conclusion

The insights gleaned from this investigation highlight the significant impact of digital health literacy on shaping health beliefs and their consequences for managing chronic diseases. As technology continues to advance, patients' ability to engage with digital health tools is crucial for understanding and utilizing healthcare services effectively. This engagement becomes even more vital in the context of chronic illnesses, where ongoing management and self-care are essential. By enhancing digital health literacy, individuals acquire the necessary skills to navigate complex health information, make informed decisions, and actively participate in their own care. Furthermore, the findings indicate that varying levels of health literacy are associated with different health outcomes across various chronic conditions.

Additionally, this research illuminates the disparities in access to digital resources and health information, which can hinder effective disease management for certain demographic groups. Addressing these inequalities will require a collaborative effort from healthcare professionals, policymakers, and

community organizations focused on improving overall health literacy and ensuring equitable access to essential resources. Future research should aim to develop interventions that effectively bridge these gaps while promoting both the functional and critical aspects of digital health literacy among diverse patient populations.

In conclusion, as the healthcare landscape increasingly embraces a technology-driven approach, prioritizing improvements in digital skills alongside health beliefs will be crucial for empowering patients on their journey toward better health outcomes. See references: [\[19\]](#), [\[25\]](#), [\[24\]](#) and [\[23\]](#) p. 1-5.

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