

The Role of Health Literacy in Chronic Disease Management: Challenges, Interventions, and Policies

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ABSTRACT: Health literacy is a key determinant of chronic disease management, affecting treatment adherence, self-care behaviors, and health outcomes. This study systematically reviewed the role of health literacy in chronic disease management, analyzing existing literature from databases such as PubMed, Scopus, and Google Scholar. The findings reveal a significant correlation between high health literacy and improved disease control, medication adherence, and reduced complications. However, disparities in health literacy remain prevalent, particularly among lower socioeconomic groups and populations with limited healthcare access. Systemic barriers, including insufficient health education, digital health inequities, and policy gaps, hinder progress in improving health literacy. Addressing these challenges requires integrating patient-centered education programs, leveraging digital health technologies, and fostering community engagement. Policymakers must implement inclusive health literacy policies to bridge knowledge gaps and enhance healthcare accessibility. Future research should focus on evaluating long-term health literacy interventions and their impact on chronic disease outcomes. Strengthening health literacy initiatives is essential for reducing health disparities and optimizing patient well-being.

Keywords: Health Literacy, Chronic Disease Management, Patient Education, Public Health Interventions, Health Outcomes, Digital Health, Health Communication.



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INTRODUCTION

Health literacy has emerged as a crucial determinant in the management of chronic diseases across diverse population groups. The rising prevalence of chronic illnesses such as diabetes, hypertension, and cardiovascular diseases underscores the need for improved health literacy at both individual and community levels. Health literacy extends beyond acquiring information; it encompasses an individual's ability to comprehend, process, and apply health-related knowledge effectively to make informed healthcare decisions. Numerous studies highlight the influence of socioeconomic background, education, healthcare access, and community support on health literacy levels (Sharma et al., 2020a). Given the complex nature of chronic disease management, understanding and addressing health literacy challenges are essential to improving health outcomes and reducing disparities in healthcare accessibility.

Education level is a primary factor influencing health literacy. Research indicates that individuals with higher education levels tend to have a better understanding of health issues, leading to improved disease management and health-related decision-making (Sharma et al., 2020b). In a study conducted in India, education significantly impacted women's ability to make informed healthcare decisions, particularly in marginalized communities (KC et al., 2021). Similarly, individuals with limited formal education often struggle to comprehend medical instructions and health guidelines, exacerbating their health conditions (Millogo et al., 2019). This necessitates the development of tailored health education programs that align with varying levels of literacy and cognitive abilities to ensure effective health communication.

Socioeconomic status also plays a crucial role in shaping health literacy. Individuals living in poverty often have limited access to quality healthcare services, reliable health information, and necessary resources for physical and mental well-being (Apuleni et al., 2021). Community-based interventions, such as school-based health education programs targeting underserved populations in South Africa, have been found to significantly enhance health literacy and promote positive health behaviors (Müller et al., 2019). Moreover, collaboration among healthcare providers, educators, and community leaders is essential to disseminating accurate and accessible health information to those most in need (Latif et al., 2017).

Healthcare accessibility is another determinant influencing health literacy, particularly among high-risk populations such as individuals with substance use disorders and marginalized communities. Limited access to medical care prevents individuals from receiving adequate health education and disease management support. Studies suggest that integrating healthcare services with peer support programs and facilitating direct access to healthcare professionals can improve both housing stability and health literacy among vulnerable populations (Snyder et al., 2021). Ensuring that marginalized communities have the means to access healthcare services is pivotal in fostering health literacy and enhancing chronic disease management outcomes.

Cultural and social support systems also significantly impact health literacy. Cultural norms, social values, and stigmas often dictate how individuals perceive health and engage with healthcare services. Research in Nepal indicates that patriarchal norms and social stigma hinder women's access to healthcare information, ultimately affecting their health literacy (KC et al., 2021). Addressing these cultural and social barriers requires context-specific health communication strategies that respect and align with the values and beliefs of different communities while promoting informed health decision-making.

Comprehensive and sustainable interventions are necessary to enhance health literacy. Studies suggest that integrating health education, social support, and improved healthcare accessibility can lead to substantial improvements in health literacy levels (Morrow et al., 2016). Tailored programs designed for adolescents and marginalized women have been particularly effective in fostering role models within communities and increasing the adoption of health-conscious behaviors (Brewer et al., 2016). By considering these factors, policymakers and healthcare providers can develop more effective literacy interventions to support individuals with chronic diseases.

Despite the growing body of literature on health literacy and chronic disease management, significant research gaps remain. One of the primary gaps is the lack of longitudinal studies

evaluating the long-term impact of health literacy interventions on chronic disease outcomes. While short-term improvements have been documented, little is known about how sustained health literacy influences health behaviors and clinical outcomes over extended periods (Javanparast et al., 2018). Another gap exists in understanding the role of digital health interventions in promoting health literacy among technologically disadvantaged populations (Sharma et al., 2020a). Furthermore, more research is needed to explore the intersection of health literacy with social determinants of health, such as housing stability, food security, and employment status (Madu et al., 2021).

This review aims to analyze the key determinants of health literacy in chronic disease management, examining the roles of education, socioeconomic status, healthcare accessibility, and cultural influences. It will also assess the effectiveness of various intervention strategies designed to improve health literacy and patient outcomes. By synthesizing recent research findings, this review seeks to provide actionable insights for policymakers, healthcare practitioners, and educators to enhance health literacy and mitigate disparities in chronic disease management.

The scope of this review focuses on diverse geographic and demographic populations, including low- and middle-income countries, rural communities, and marginalized groups within developed nations. Special attention will be given to evidence-based interventions that have demonstrated success in improving health literacy and chronic disease management in these populations. By identifying best practices and potential areas for future research, this review will contribute to the development of more inclusive and effective health literacy initiatives globally.

METHOD

This study employed a systematic literature review approach to identify and analyze existing research on health literacy and chronic disease management. To ensure a comprehensive and rigorous assessment of relevant literature, multiple academic databases were utilized, including PubMed, Scopus, and Google Scholar. These databases were selected due to their extensive repositories of peer-reviewed articles and multidisciplinary coverage of health sciences, public health, and biomedical research. PubMed was particularly useful for accessing biomedical and clinical research articles, while Scopus provided a broader scope of interdisciplinary studies, including health policy and social sciences perspectives. Google Scholar was included to capture a wider range of literature, including gray literature, conference proceedings, and institutional reports that may not be indexed in traditional academic databases.

The search strategy was structured to retrieve relevant articles using a combination of carefully selected keywords and Boolean operators. The primary search terms included “health literacy,” “chronic diseases,” “disease management,” “patient education,” “health outcomes,” “public health interventions,” and “health communication.” These keywords were used in various combinations with Boolean operators such as **AND** and **OR** to refine search results and ensure the retrieval of studies encompassing different aspects of health literacy in chronic disease contexts. For instance, searches such as “health literacy AND chronic diseases” or “patient education OR health communication AND chronic disease management” were utilized to maximize relevant article

retrieval. Additionally, variations of these terms, including synonyms like “patient empowerment” and “self-management,” were incorporated to ensure a broader yet precise literature capture.

To enhance the relevance and quality of the selected studies, specific inclusion and exclusion criteria were established. Studies included in this review were those published in peer-reviewed journals, available in English, and published within the last ten years to ensure that only recent and up-to-date findings were considered. Furthermore, the review focused on studies that examined the relationship between health literacy and chronic disease management, evaluated the effectiveness of health literacy interventions, or explored patient education strategies in improving health outcomes for chronic disease patients. Empirical studies employing both qualitative and quantitative methodologies were considered, including randomized controlled trials (RCTs), cohort studies, cross-sectional studies, and systematic reviews. Articles that presented theoretical discussions without empirical data or focused on unrelated health conditions were excluded from the analysis. Additionally, studies that lacked methodological rigor, such as those with small sample sizes or insufficient data reporting, were not included in the final selection.

The literature selection process followed a systematic screening and evaluation protocol to ensure the inclusion of high-quality research. Initially, duplicate records were removed, and titles and abstracts were screened for relevance to the research focus. Articles that met the initial screening criteria underwent a full-text review, where two independent reviewers assessed their methodological soundness, relevance, and contribution to the research topic. Discrepancies in selection were resolved through discussion and consensus. The final selection comprised studies that provided robust evidence on the role of health literacy in chronic disease management, patient education, and health communication interventions.

A data extraction process was conducted to systematically collect key information from each selected study. Extracted data included study objectives, methodology, sample characteristics, intervention or exposure details, key findings, and conclusions. This structured approach enabled the synthesis of relevant findings and facilitated thematic analysis of the literature. Additionally, critical appraisal tools such as the Cochrane Risk of Bias Tool for RCTs and the Newcastle-Ottawa Scale for observational studies were used to assess study quality and potential biases.

To ensure the comprehensiveness of the review, citation tracking and backward reference searching were employed. This involved reviewing the reference lists of selected studies to identify additional relevant articles that may not have been captured in the initial search. Furthermore, expert consultations were conducted with professionals in the field of public health and health literacy to validate the selection of studies and gain insights into emerging trends and research gaps.

By employing a rigorous and systematic methodology, this study provides a robust synthesis of existing literature on health literacy and chronic disease management. The approach ensures that findings are based on high-quality research, offering valuable insights for healthcare practitioners, policymakers, and researchers in designing effective health literacy interventions aimed at improving patient outcomes and healthcare accessibility.

RESULT AND DISCUSSION

Relationship Between Health Literacy and Chronic Disease Management

Research has consistently demonstrated a significant relationship between health literacy and the management of chronic diseases. Health literacy serves as a crucial bridge connecting patients' knowledge of their conditions with the effectiveness of disease management strategies. Patients with higher levels of health literacy tend to have a better understanding of their illnesses and the recommended treatment protocols (Apuleni et al., 2021). Additionally, these individuals are more likely to actively participate in medical decision-making, which has a positive impact on medication adherence and overall health outcomes. Studies have shown that adequate health literacy is associated with improved compliance with treatment regimens, timely medical follow-ups, and a lower incidence of complications commonly observed in chronic disease patients, such as those suffering from diabetes and cardiovascular conditions (Scopazzini et al., 2021).

Furthermore, structured and clear health education programs have been shown to enhance health literacy. Huang et al. (2021) found that well-designed educational interventions implemented at the community level significantly improved health knowledge and encouraged positive health behavior changes (Huang et al., 2021a). These findings highlight the importance of not only disseminating information but also employing effective communication strategies to ensure that patients comprehend and apply health knowledge in managing their chronic conditions (Apuleni et al., 2021).

The Influence of Health Literacy Disparities on Patient Adherence

Variations in health literacy levels among individuals have a profound effect on treatment adherence and lifestyle modifications. Research conducted in Zambia found that patients with low health literacy often fail to follow prescribed medical instructions, leading to adverse health outcomes (Apuleni et al., 2021). Many of these individuals struggle to understand the significance of medication adherence, resulting in missed doses or premature discontinuation of treatment.

Beyond medication adherence, limited health literacy negatively impacts patients' ability to adopt necessary lifestyle changes required for chronic disease management. For instance, knowledge about the role of diet, exercise, and stress management is crucial for individuals managing conditions such as hypertension and diabetes. Patients with higher levels of health literacy are more successful in integrating these health-conscious behaviors into their daily lives, primarily due to a better understanding of how lifestyle choices affect their overall health (Scopazzini et al., 2021).

Additionally, studies analyzing health-seeking behaviors among patients with diverse socioeconomic backgrounds reveal that individuals with higher health literacy are more proactive in accessing health information. They are more likely to attend health education programs, seek medical advice, and utilize available healthcare resources (Scopazzini et al., 2021). This underscores the role of health literacy as a key determinant in encouraging regular health check-ups and promoting effective long-term disease management strategies.

Given the significant impact of health literacy on patient adherence and disease management, healthcare interventions must be tailored to address literacy disparities. Current research

emphasizes the need for customized approaches based on patients' literacy levels to ensure that educational materials and support programs are both relevant and accessible, regardless of individuals' educational or socioeconomic backgrounds (Théard, 2021).

The Impact of Health Literacy on Patients' Quality of Life

Health literacy plays a pivotal role in determining the quality of life among patients with chronic diseases. Recent findings suggest that higher health literacy levels contribute to improved disease comprehension, enabling patients to manage their conditions more effectively and experience a better quality of life. Patients with a solid grasp of their medical conditions are better equipped to follow treatment protocols, adjust their daily routines, and seek timely medical assistance when needed (Huang et al., 2021a).

Connection Between Health Literacy and Quality of Life

One of the most critical aspects of health literacy is its influence on patients' ability to understand their illnesses and make informed healthcare decisions. Huang et al. (2021) highlighted that well-structured health education programs contribute to increased patient engagement and comprehension of medical conditions (Huang et al., 2021b). Patients who possess a higher degree of health literacy demonstrate greater confidence in making healthcare choices, leading to reduced hospital admissions and fewer emergency visits.

Moreover, patients with adequate health literacy levels are more likely to adhere to prescribed treatment plans. Improved adherence results in better disease control and lower risks of complications. A study conducted in Kenya demonstrated that mobile health (mHealth) interventions aimed at improving health literacy led to increased patient attendance at medical appointments and enhanced compliance with prescribed medications (Ngaruiya et al., 2019). These findings reinforce the argument that improving health literacy levels can result in superior health outcomes, ultimately enhancing patients' quality of life.

Empirical Evidence Linking Health Literacy and Disease Complications

Several studies provide compelling empirical evidence supporting the connection between health literacy and the reduction of chronic disease complications. Ali et al. (2021) found that community-based interventions that focused on improving patient health literacy significantly reduced long-term complications associated with chronic diseases (Ali et al., 2019). The study emphasized that well-informed patients were more likely to recognize early warning signs of health deterioration, enabling them to seek timely medical intervention.

Longitudinal studies also support the idea that sustained health literacy interventions lead to long-term improvements in patient well-being. Ngaruiya et al. (2019) found that patients who received continuous health literacy support exhibited lower levels of anxiety regarding disease management, further highlighting the importance of education in fostering proactive healthcare behaviors (Ngaruiya et al., 2019).

Cross-Country Comparisons in Health Literacy Strategies

Health Literacy Promotion Strategies Across Countries

Different countries have adopted varying approaches to enhance health literacy, often tailoring strategies to fit local contexts and population needs. In high-income countries such as Canada and Germany, health literacy is promoted through community-based initiatives and public policies that integrate health education into formal education systems (Apuleni et al., 2021). These programs emphasize preventive care and patient empowerment by ensuring that individuals have access to reliable health information.

Conversely, in resource-limited settings such as Zambia and Tanzania, health literacy interventions often rely on peer education and community outreach programs (Mahboob et al., 2020; Ngilangwa et al., 2016). Given the limited availability of healthcare professionals and resources in these regions, peer-led health education programs have proven effective in bridging knowledge gaps and empowering patients to manage their health conditions more effectively.

Many countries have also integrated digital technology into their health literacy promotion efforts. Mobile health (mHealth) applications are increasingly being used to disseminate health information and provide real-time support to patients managing chronic diseases. Research has shown that well-designed mHealth applications not only facilitate patient education but also provide medication reminders and lifestyle recommendations, contributing to improved health outcomes (Huang et al., 2021a).

Factors Influencing the Success of Health Literacy Programs

Several factors influence the effectiveness of health literacy programs across different healthcare systems. One critical factor is the extent of community involvement in program implementation. Ngilangwa et al. (2016) found that health literacy interventions that engaged community leaders and local stakeholders achieved higher success rates in reaching individuals with low literacy levels. This highlights the importance of culturally sensitive approaches and the inclusion of community-based knowledge in designing effective interventions (Ngilangwa et al., 2016).

Another key determinant is access to healthcare resources. In countries with limited access to healthcare infrastructure and educational materials, digital-based interventions may not be feasible or effective (Latif et al., 2019). Therefore, health literacy initiatives must be contextually appropriate, considering the local availability of resources and technological capacity.

Government support and policy frameworks also play a vital role in promoting health literacy. Countries that have integrated health literacy into national healthcare policies and educational curricula have seen greater success in reducing health disparities (Dean et al., 2019). Public-private collaborations that provide funding and logistical support for literacy programs further enhance the sustainability and impact of these initiatives.

The findings of this study reaffirm the significant relationship between health literacy and chronic disease management, aligning with prior research. Higher health literacy has been consistently linked to improved health outcomes among patients with chronic conditions such as diabetes and hypertension. These results echo previous studies, including those by Huang, Maleki, Regehr, and McEwen (2021), which found that individuals with strong health literacy are more adept at understanding medical information and making informed healthcare decisions (23). Furthermore,

education based approaches have been demonstrated to be effective in improving health literacy among patients with chronic diseases (24)

However, beyond individual capabilities, health literacy is deeply embedded within broader social and cultural contexts that shape how patients understand, interpret, and act upon health related information. Cultural beliefs, societal norms, and communal practices significantly influence how health messages are received and whether they are translated into behavior change. For instance, in many patriarchal societies, women's health decisions are often mediated by family or community structures, limiting direct access to information and healthcare services (25). Similarly, cultural stigmas surrounding chronic conditions such as diabetes or mental health may discourage individuals from seeking timely care or adhering to prescribed treatments. These dynamics highlight the need to embed culturally sensitive approaches in health literacy programs.

Community beliefs also play a critical role in health communication. In some rural or marginalized settings, traditional health knowledge and alternative healing systems coexist with modern medicine, sometimes creating friction in patient decision making. A study in Nepal revealed that women's limited health literacy was compounded by social stigma and restricted mobility, leading to underutilization of healthcare services (25). This suggests that literacy interventions must consider local customs, health seeking behaviors, and intergenerational knowledge systems to be effective. Furthermore, linguistic diversity and low literacy levels in native languages often create additional barriers to understanding health information, especially when materials are only available in national or foreign languages.

Comparison with Previous Studies

Prior research has extensively highlighted the crucial role of health literacy in chronic disease management. Apuleni et al. (2021) demonstrated that patients with higher health literacy are more knowledgeable about their conditions and the necessary treatments. These findings emphasize that health literacy is not only associated with improved disease management but also contributes to lower complication rates, as previously documented(24).

Similarly, Sonu, Marvin, and Moore (2021) underscored that the effectiveness of health literacy programs depends on various factors, including community involvement and the contextualization of educational approaches to local needs. This study corroborates these claims by reinforcing the necessity of designing health literacy programs that are culturally and socially relevant to patients(26).

Variability in the Success of Health Literacy Programs

Although the evidence supporting health literacy's impact on disease management is strong, the success of health literacy programs varies significantly based on contextual factors. One key factor influencing disparities in effectiveness is the socioeconomic and healthcare environment in which these programs are implemented. Sharma, Mehra, Akhtar, and Mehra (2020) found that in resource limited settings, strong structural support is essential to successfully implementing health literacy

strategies. In contrast, in countries with well developed healthcare infrastructures, health literacy is often driven by integrated public health policies and formal education systems(27).

Another critical determinant of success is the use of technology. Jozaghi, Yake, Maynard, and Blyth (2018) showed that mobile applications and digital health platforms could enhance patient engagement in disease management, particularly in underserved populations(28). However, not all patient groups have equal access to digital technology, which can create gaps in the effectiveness of health education programs. This study also identifies digital disparities as a potential barrier, particularly among older adults or individuals in low income communities who may lack access to or familiarity with mobile health solutions.

Systemic Challenges in Improving Health Literacy

Several systemic challenges hinder efforts to improve health literacy among patients with chronic diseases. One of the most pressing challenges is the unequal access to health information and resources. Many populations, particularly those in remote or underserved areas, lack adequate access to accurate and reliable health information. This challenge is compounded by social and economic inequalities, which further limit individuals' opportunities to acquire the necessary knowledge about their health (29,30).

Another significant challenge is the availability of effective health education programs. While numerous interventions aim to enhance health literacy, many fail to reach those most in need. This shortfall may be attributed to educational materials that are not appropriately tailored to different literacy levels or dissemination methods that are inaccessible to marginalized populations (31).

Furthermore, communication barriers also pose a major challenge. The availability of health education resources in the appropriate language and cultural context is crucial. Programs that do not consider cultural and linguistic diversity risk being ineffective in improving health literacy among minority populations (22).

Supportive and Inhibitive Health Policies

Health policies play a dual role in either supporting or hindering the advancement of health literacy. On the supportive side, some healthcare policies promote community based health education programs aimed at reducing disparities in health literacy among high risk populations (32). Many of these policies include financial support for training healthcare providers and educating communities about disease management and prevention.

Conversely, poorly integrated policies can obstruct health literacy improvements. For instance, as telemedicine and digital health tools gain prominence, policies that do not ensure equitable access to these technologies may inadvertently widen health disparities (33). This potential for exclusion is particularly concerning for disadvantaged groups who may lack the digital literacy or financial resources necessary to benefit from online health interventions.

Moreover, fragmented health policies often limit the effectiveness of health literacy initiatives. Many interventions are implemented in isolation without consideration of broader social

determinants of health, such as education, housing, and employment (22,34). For health literacy policies to be effective, they must be part of a multi sectoral approach that integrates healthcare, education, and community engagement.

CONCLUSION

This study confirms that health literacy plays a crucial role in the management of chronic diseases, significantly influencing patient adherence to treatment, self-care behaviors, and overall health outcomes. The findings indicate that individuals with higher levels of health literacy demonstrate better disease management, leading to lower complication rates and improved quality of life. However, disparities in health literacy persist due to socioeconomic barriers, inadequate access to health information, and gaps in policy implementation.

Addressing these issues requires a multifaceted approach, incorporating tailored education programs, digital health tools, and community-based interventions. Policymakers must prioritize inclusive health literacy strategies, ensuring accessibility to information for all populations, particularly marginalized groups. Future research should explore the long-term impacts of health literacy interventions, the role of digital health solutions in diverse populations, and the integration of health literacy into public health policies. Strengthening health literacy initiatives will be essential in bridging health disparities and improving chronic disease outcomes globally.

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