

Scoping Review on Health Literacy and Its Effect on Medication Adherence in Chronic Disease Patients

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Abstract

Health literacy (HL) is an important aspect of various literacies in the field of health and education. Medication adherence is important for effective treatment regimens and managing several health conditions. Scoping review was conducted to define health literacy and its effects on medication adherence among chronic disease. Articles from PubMed and Google Scholar with selected keywords were selected for review. Inclusion criteria were adults aged 18 and above with chronic diseases in the community. Data was collected and reviewed by two researchers. All included articles were summarized to understand the relationship between health literacy and medication adherence among patients with chronic diseases. A total of 13 out of 18153 articles were found and included in this review. Three articles defined health literacy, and ten articles were reviewed for the correlation between health literacy and medication adherence in patients with chronic diseases. Out of the ten articles, four focused on non-specific chronic diseases, three on type 2 diabetes mellitus, and three on hypertension. Understanding health literacy's definition can affect medication adherence. Health literacy together with medication adherence can be affected naturally, and interventions are necessary to improve them. Individual differences also play a role in health literacy and medication adherence. The relationship between health literacy and also medication adherence heavily affects individuals with chronic diseases.

Keywords: health literacy; medication adherence; chronic diseases; non-communicable diseases.

Introduction

Patients today have to manage complex self-care routines and take different medications, but medications taken inappropriately can lead to serious problems. This is especially true if patients do not understand their health information well. Research shows that over 300 million people struggle to understand health-related information. Misunderstandings can lead to lower awareness of illness, worse health outcomes, and more hospital visits(1). In 2016, the National Survey on the Use of Medicines (NSUM) in Malaysia surveyed consumers. The results showed that different factors influenced people's choice to buy medications from clinics. These factors include age, ethnicity, job, education level, and monthly income(2).

Non-adherence to medical and drug recommendations is a significant public health issue as postulated by Ngoh. The phrases *adherence* and *compliance* are interchangeable, although their implications differ. *Adherence* suggests the patient agrees with the instructions, whereas *compliance* implies passiveness(3). Medication compliance, often referred to as medication adherence, is the extent to which a patient follows their doctor's instructions and suggestions when taking medication. For treatment regimens to be effective and for a variety of health issues to be managed, medication adherence is necessary. Non-adherence can result in worsening symptoms, inefficient therapy, higher medical expenses, and a decline in general well-being.

Malaysia's National Health Morbidity Survey of 2015 revealed that the

country's incidence of chronic diseases is rising. The largest incidence of non-communicable diseases nationwide was determined to be hypercholesterolemia, which was followed by hypertension and diabetes mellitus (4). According to the National Survey on the Use of Medicines (NSUM) by Malaysian Consumers in 2016, of the respondents, about 30.3% said they were taking chronic medications. There emerges a significant and well-researched correlation between medication adherence and also health literacy in the context of chronic diseases. An important consideration in the treatment of chronic diseases mostly in the elderly is medication adherence. Age-related changes in medication adherence as well as behaviours towards medication (5). Interventions are needed to improve health literacy in chronic disease settings. Studies have identified factors contributing to poor medication adherence, but more research is required to focus on health literacy as the primary factor. Effective therapies to enhance adherence are in demand with the increase in self-administered medicines. Recent studies aim to understand the complex obstacles that influence patient adherence(6). This scoping review study investigated health literacy and its effects on medication adherence in chronic disease patients to understand medication adherence in people who self-administer medication.

Methods & Materials

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) Checklist criteria are used in reporting this scoping review (7).

During November and December of 2023, a thorough search of the literature was conducted on Google Scholar and PubMed. The focus of the search was to gather relevant articles, surveys, and journals related to medication adherence, health literacy, chronic diseases, and

patient hypertension, diabetes mellitus, and cardiovascular disease. The search only included peer-reviewed journals published in English. The search terms utilized were carefully selected to match the present study design and included qualitative, interview, survey, questionnaire, systematic review, and meta-analysis.

An example of search strategy in PubMed as follows: ("health literacy"[MeSH Terms] OR ("health"[All Fields] AND "literacy"[All Fields]) OR "health literacy"[All Fields]) AND ("effect"[All Fields] OR "effects"[All Fields]) AND ("medication adherence"[MeSH Terms] OR ("medication"[All Fields] AND "adherence"[All Fields]) OR "medication adherence"[All Fields]) AND ("chronic disease"[MeSH Terms] OR ("chronic"[All Fields] AND "disease"[All Fields]) OR "chronic disease"[All Fields])) AND ((frft[Filter]) AND (2010:2024[pdat])).

Inclusion and exclusion criteria

This study reviewed published research on health literacy together with medication adherence in the context of chronic diseases from a community perspective. The inclusion criteria were limited to articles, surveys, and journals related to common chronic diseases in Malaysia, published in English within the last 20 years. The study only focused on adults aged 18 years or older with chronic diseases and excluded articles on mental health conditions, children and adolescents under 18 years, and publications unrelated to research objectives or common chronic diseases in Malaysia.

Study selection

We conducted a thorough search across 13 publications to identify pertinent articles, surveys, journals, or systematic reviews. We then removed any duplicates and screened titles and abstracts to determine eligibility. Relevant articles were subject to a full-text review, and reviewers regularly discussed eligibility criteria. Our focus was on describing the effect of health

literacy on medication adherence among chronic disease patients, and thus, no risk of bias was assessed.

Data extraction and synthesis

Firstly, we defined health literacy by identifying crucial details, such as the author, publication year, and definition used in various articles. Data was collected by two researchers using a Microsoft Excel template. We reviewed and assessed the data for quality, and then synthesized the findings both qualitatively and narratively. Finally, we summarized articles, surveys, and systematic reviews from the ten included articles, focusing on the relationship between health literacy and medication adherence in patients with chronic diseases.

Results and Discussion

Figure 1 shows the process of selecting articles. A total of 18153 articles were found from PubMed and Google Scholar, out of which 13 were included in the review. Three duplicates were removed before the screening process. Articles that

were excluded in this stage were 64, with various reasons as follows: irrelevant to studies, wrong population, wrong diseases, wrong outcomes, wrong language, unrelated title, wrong medications, and study protocol. The articles included varied study designs and analyzed both quantitative and qualitative data. The review covered three articles on health literacy's definition and ten articles on the connection with medication adherence in patients with chronic diseases, with four articles on nonspecific chronic diseases, three on type 2 diabetes mellitus, and three on hypertension.

Definitions of health literacy

Understanding the concept of health literacy is vital in effectively communicating messages, promoting health equity and patient empowerment, conducting research, developing policies, clinical practice, and public health programs. In a 2020 study on the Influence of Health Literacy on Medication Adherence Among Elderly Females with Type 2 Diabetes in Pakistan, health literacy

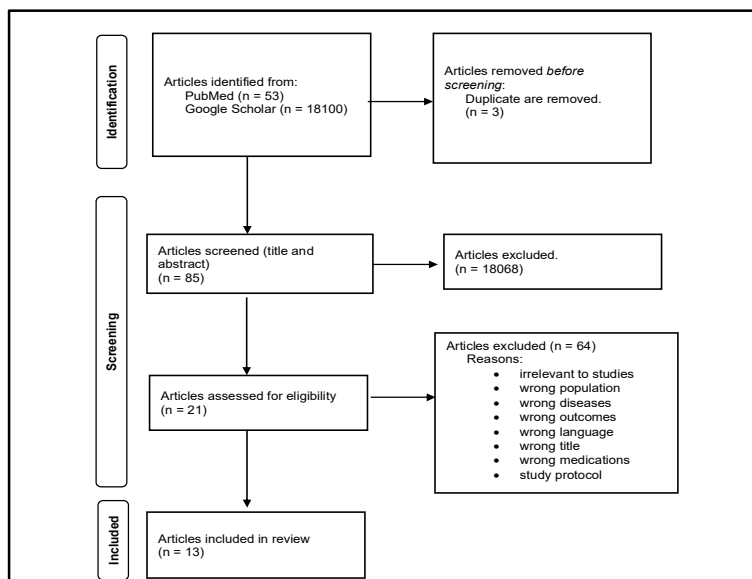


Figure 1: Flow diagram of the article selection process

was defined as "the skills of reading and writing (also known as print literacy). It also includes speaking or listening (oral literacy), conceptual knowledge, and the ability to apply numbers as needed to manage health (quantitative literacy or numeracy)." Hussain et. al study revealed important differences in medication adherence between those who met the criteria for adequate health literacy and those who did not, indicating the impact of health literacy on medication adherence

Another 2020 study on Health Literacy and Health Beliefs with Adherence to Antihypertensive Medications in an Urban African American Cohort defined health literacy as "the ability to understand and act on a physician's instructions, is related to morbidity and mortality from a variety of conditions" which the opinions of participants on the importance of exercising, getting prescriptions filled for antihypertensive medications, and maintaining a healthy diet were indicative of their health literacy. In line with previous studies, the study discovered that health literacy was an important indicator for medication adherence (8).

To address the lack of a widely agreed-upon definition for the term "health literacy," a systematic review was conducted in 2012 titled "Health Literacy and Public Health: A Systematic Review and Integration of Definitions and Models" where 17 different definitions focus on a person's capacity to access, process, and understand health-related information and services to make well-informed decisions about their health. The authors defined health literacy as "people's knowledge, motivation, and competencies to access, understand, appraise, and apply health information to make judgments and take decisions in everyday life concerning healthcare, disease prevention, and health promotion to maintain or improve quality of life during the life course" (9).

The effects or relationship of health literacy on medication adherence in chronic disease patients

In this review, we examined 10 studies that investigated the connection between health literacy with medication adherence among individuals with chronic illnesses across 6 different countries. From the 10 studies, 4 were conducted in the United States, 2 in China, and 1 each in Switzerland, Japan, Taiwan, and Malaysia. The studies primarily centered on prevalent chronic conditions of type 2 diabetes and hypertension. Out of the 10 studies, 6 revealed a strong interrelation between health literacy and medication adherence. Conversely, 3 studies did not demonstrate a clear connection, while 1 showed no effect.

Many research studies the connection between chronic disease patients' medication adherence and health literacy. Younger individuals who experience side effects are more likely to be unintentionally non-adherent(10). Medication adherence can be enhanced by health literacy and social support (11). There exists a positive relationship between health literacy with medication adherence(12,13). In addition, a studyrevealed a positive relationship of health literacy and medication adherence and a negative relationship between treatment burden and medication adherence(14). Text messages improve patients' health literacy levels and medication adherence(15).

Health literacy indirectly affects medication adherence through factors such as medication self-efficacy and health status(16). Someimpacts of health literacy are on refill adherence(17). Medication adherence was inversely associated with health literacy, but only after controlling for cognitive ability(18). There was improved compliance to antihypertensive medication associated with higher health literacy, but self-reported levels of adherence to antihypertensive medications and health literacy were both low(19) (Table 1).

Table 1: Summary of Scoping Review for Health Literacy and Medication Adherence in Chronic Disease Patients					
Study	Study Design	Concept	Results	Illness	Country
(Guo et al., 2023)	Community-based cross-sectional study	Structural equation modelling (SEM) is used to look into the interrelationship between latent variables such as health literacy and medication adherence.	Health literacy not only directly affects the level of medication adherence among hypertension patients, but also indirectly mediates the relationship of medication adherence with age, education level and marital status.	Hypertension	China
(Náfrádi et al., 2016)	Cross-sectional survey	Assess the socio-demographic, clinical and psychological determinants of intentional and unintentional non-adherence	Health literacy is shown to be revealed as a positive determinant of intentional medication adherence	Hypertension	Switzerland
(Yeh et al., 2018)	Cross-sectional survey study	Evaluate the relation between disease-specific health literacy, disease knowledge and adherence behaviour of patients with type 2 diabetes.	Critical health literacy includes numeracy skills and using this information to make further decisions. It resulted in the respondents having poor numeracy skills which included medication adherence as a numeracy item. Low health literacy worsens diabetes as it is associated with adherence behaviour	Type 2 Diabetes Mellitus	Taiwan
<i>(Contd.)</i>					

Table 1: Summary of Scoping Review for Health Literacy and Medication Adherence in Chronic Disease Patients (<i>Contd.</i>)					
Study	Study Design	Concept	Results	Illness	Country
(Miller, 2016)	Quantitative meta-analysis	Study of the relation between patient health literacy and both medication adherence and non-adherence with health literacy interventions effects.	The average relationship between health literacy and patient adherence suggests positive and highly significant, thus increasing both health literacy and treatment adherence	Chronic diseases	United States
(Selvakumar et al., 2023)	Cross-sectional study	Assess effects of treatment burden with health literacy towards medication adherence among older adults with multiple chronic conditions (MCC)	This resulted in a significantly negative correlation between treatment burden and medication adherence, but a significantly positive correlation between health literacy with medication adherence.	Chronic diseases	Malaysia
(Sugita et al., 2017)	Single-centre, open-label, randomized controlled study	Evaluating text message-based health literacy intervention promoting medication adherence compared to text message reminders only	Text messages affect medication adherence which leads to improvement of the patient's health literacy levels	Type 2 Diabetes Mellitus	Japan
<i>(Contd.)</i>					

Table 1: Summary of Scoping Review for Health Literacy and Medication Adherence in Chronic Disease Patients (<i>Contd.</i>)					
Study	Study Design	Concept	Results	Illness	Country
(Huang et al., 2018)	Cross-sectional study utilized a face-to-face survey	Associating health literacy and medication self-efficacy with self-reported diabetes medication adherence	After adjusting other variables, initial data revealed health status and medication self-efficacy related to diabetic medication adherence, although health literacy was not. Health literacy may not be directly related but it influences drug adherence.	Type 2 Diabetes Mellitus	United States
(Gazmararian et al., 2006)	Prospective cohort study	Evaluating the relation between health literacy and medication refill adherence with medications used for cardiovascular disease.	Health literacy resulted in a moderate effect on refill adherence but overlapped with the null hypothesis when controlling other factors. No association between health literacy and refill adherence but not rule out the relation to medication adherence.	Chronic diseases	United States
<i>(Contd.)</i>					

Table 1: Summary of Scoping Review for Health Literacy and Medication Adherence in Chronic Disease Patients (<i>Contd.</i>)					
Study	Study Design	Concept	Results	Illness	Country
(Jia et al., 2022)	Cross-sectional survey	Looking into the relationship between health literacy and medication adherence and intervention of cognitive ability among older adults with chronic disease.	Health literacy was negatively associated with medication adherence but when the cognitive ability factor was controlled, the association was still found between health literacy and medication adherence.	Chronic diseases	China
(Lor et al., 2019)	Cross-sectional survey	Evaluate the correlation of health literacy level and antihypertensive medications adherence	Higher health literacy associated with better adherence, but both health literacy and self-reported antihypertension medication adherence levels are low among study participants.	Hypertension	United States

Health literacy definition affects medication adherence

Effective health management involves two key components: medication adherence and health literacy. Health literacy encompasses the capability to access, comprehend, and apply fundamental health information and services. This includes reading and comprehending medication labels, interpreting dosage instructions, and navigating the healthcare system. As patient involvement in decision-making

becomes more valued, health literacy plays an increasingly important role. Although health literacy has been defined in a variety of ways, it typically refers to a person's proficiency in locating, comprehending, and utilizing health information in a streamlined manner.

Nature effects on health literacy and medication adherence

Older adults with low health literacy face higher risk of hospital admissions, worse self-management abilities, and

problems with medication adherence. Health literacy can affect medication adherence based on sociodemographic factors, and age is a prevalent factor. Older patients are more likely to use adherence aids, while younger participants report higher levels of unintentional non-adherence due to lifestyle factors.

Approaches in enhancing health literacy and medication adherence

Medication adherence efforts are useful for enhancing health literacy. Text messages encouraging medication adherence are particularly useful. By involving patients in clear communication techniques, we can enhance their understanding of treatment regimens, prescription guidelines, and potential side effects, leading to improved health literacy. Comprehensive health literacy interventions can address a wide range of health-related knowledge and skills, while also considering individual needs and varying levels of health literacy.

Individual differences affect health literacy and medication adherence

The consequence of health literacy on medication adherence in patients with chronic diseases may be influenced by several factors, including the intricate nature of individual health behaviors and variances. Past research indicates that individuals with low level of health literacy encounter difficulties with medication adherence and comprehending their treatment plans. Additional studies are necessary to discern the full extent of this issue. This scoping review offers valuable perspectives on health literacy definitions, factors that impact medication adherence, and can aid in developing effective treatment approaches.

Conclusion

The relationship between health literacy and medication adherence heavily affects individuals with chronic diseases.

Those who possess a high level of health literacy are better equipped to comprehend prescription instructions, which ultimately reduces the occurrence of medication errors. Understanding the importance of health literacy is crucial for various sectors such as research, policy creation, clinical practice, public health initiatives, and patient empowerment. Furthermore, patients who have a heightened level of health literacy adhere more to their prescribed medication regimen. As such, health literacy has a significant role in medication adherence for chronic disease patients and can be improved through various factors. Researching medication adherence interventions can prove to be highly beneficial for patients dealing with chronic diseases, particularly the elderly. With the elderly being commonly affected by chronic conditions and being prescribed multiple long-term medications, this research can shed light on the various factors that impact medication adherence and aid in addressing the challenges faced by this demographic in following their recommended prescriptions.

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