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Health Literacy as a Determinant of Treatment Adherence and Infectious Disease Prevention Behavior: A Conceptual Analysis

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Abstract: Health literacy is a crucial determinant of public health behavior, particularly in the control of infectious diseases in developing countries like Timor-Leste. Individuals' limited ability to access, understand, and use health information often results in low medication adherence and weak preventive behavior. This article aims to conceptually analyze the role of health literacy as a determinant of medication adherence and infectious disease prevention behavior from the perspective of social determinants of health. This study uses a literature review method with a narrative synthesis approach to relevant theories and empirical findings. The analysis shows that health literacy contributes by improving understanding of medical instructions, strengthening self-efficacy, and the ability to make informed decisions. Adequate literacy encourages adherence to therapy and consistent preventive behaviors, such as hygiene practices and utilization of health services. Conceptually, health literacy is positioned not only as an individual capacity but also as a structural factor influenced by the education system and public policy. Therefore, strengthening health literacy is a key strategy in infectious disease control.

Keyword: Health Literacy, Medication Compliance, Preventive Behavior, Infectious Diseases.

INTRODUCTION

Infectious diseases remain a major global public health challenge, particularly in developing countries with limited resources and unequal access to healthcare services. The World Health Organization (WHO) emphasizes that controlling infectious diseases depends not only on the availability of healthcare facilities but also on individuals' capacity to understand and use health information effectively (World Health Organization [WHO], 2017). In this context, health literacy is crucial because it determines how individuals interpret medical information, follow therapeutic recommendations, and consistently implement preventive behaviors.

Health literacy is defined as an individual's ability to access, understand, evaluate, and use health information to make informed health decisions (Nutbeam, 2000). Empirical studies show that low levels of health literacy are correlated with poor medication adherence, increased hospitalization rates, and a higher risk of disease complications (Berkman et al., 2011). Furthermore, health literacy plays a significant role in shaping preventative behaviors, such as hygiene practices, vaccinations, and utilization of preventive health services (Sørensen et al., 2012). Thus, health literacy functions not only as an individual cognitive capacity but also as a social determinant that broadly influences health outcomes.

From the perspective of Social Determinants of Health, individual health is influenced by interacting social, economic, educational, and environmental factors (Marmot & Wilkinson, 2005). Health literacy lies at the intersection of structural and intermediary determinants, as it is influenced by the education system, access to information, and public policy, while simultaneously influencing health behaviors and outcomes. Although various studies have examined the relationship between health literacy and medication adherence or preventive behaviors separately, studies integrating these two outcomes within a single conceptual framework are relatively limited. Most studies are quantitative empirical studies focusing on specific diseases, so few offer a comprehensive theoretical synthesis of the conceptual mechanisms linking health literacy to these two dimensions of health behavior.

This research gap highlights the need for conceptual studies that position health literacy as a key determinant simultaneously influencing both medication adherence and infectious disease prevention behavior. Integrating these two dependent variables is crucial because medication adherence represents the curative dimension, while preventive behavior represents the preventive dimension within the disease control spectrum. To date, few articles have systematically developed an integrated conceptual model that explains these relationships from the perspective of social determinants of health.

Based on this description, this article offers novelty in the form of developing a conceptual framework that integrates health literacy as a determinant of two key outcomes: medication adherence and infectious disease prevention behavior. This article not only synthesizes existing theories and empirical findings but also positions health literacy as a strategic factor in the formulation of public health policies. Thus, this study is expected to provide theoretical contributions to the development of health determinant models and practical implications for strengthening health literacy-based interventions.

METHOD

This study uses a conceptual approach with an integrative literature review method to develop a theoretical framework regarding the role of health literacy as a determinant of medication adherence and infectious disease prevention behavior. An integrative review approach was chosen because it allows the integration of empirical and conceptual findings from various research designs to build a comprehensive theoretical synthesis (Whittemore & Knafl, 2005). This method is relevant for developing new conceptual models and clarifying relationships between variables within the social determinants of health framework.

The literature search process was conducted systematically in several internationally reputable databases, including Scopus, PubMed, and Web of Science. The search strategy used a combination of keywords: “health literacy,” “medication adherence,” “preventive behavior,” “infectious disease,” and “social determinants of health.” Article selection was carried out with the following inclusion criteria: (1) articles published in peer-reviewed journals; (2) indexed in Scopus or reputable international databases; (3) discussing health

literacy in relation to medication adherence or preventive behavior; and (4) available in full text in English. Articles containing editorials, non-scientific opinions, or conceptually irrelevant articles were excluded from the analysis.

The analysis followed the five steps of an integrative review as outlined by Whittemore and Knafl (2005): problem identification, literature search, source quality evaluation, data analysis, and synthesis. Quality evaluation was conducted by considering methodological credibility, theoretical relevance, and the consistency of empirical findings across studies. Next, the synthesis was conducted narratively and conceptually by identifying patterns of relationships between health literacy and two key outcomes: medication adherence and infectious disease prevention behavior.

RESULT AND DISCUSSION

Health Literacy

Health literacy is an individual's ability to obtain, understand, evaluate, and use health information to make informed decisions regarding their own health and their social environment. According to Sorensen et al. (2012), health literacy encompasses a range of skills including reading comprehension, risk assessment, and the use of health information for preventive behavior and health promotion and disease management. This concept encompasses not only functional reading and writing skills but also interactive and critical skills necessary for active participation in the health system (Nutbeam, 2008). The US Department of Health & Human Services (2010) defines health literacy as an individual's ability to understand medical instructions, navigate health services, and make evidence-based decisions, which are crucial in the context of modern health care.

Theoretically, health literacy can be understood through the Pathways to Health Outcomes model, which explains the relationship between health literacy and health outcomes through behavioral pathways, patient-provider interactions, and disease management. Pasache-Orlow and Wolf (2007) suggest that health literacy influences access to and use of health services, the quality of communication with healthcare professionals, and an individual's self-care capacity. This model provides a strong theoretical foundation for explaining how health literacy impacts outcome variables such as medication adherence and preventive behaviors.

Furthermore, Social Cognitive theory also provides the perspective that health literacy increases self-efficacy, namely an individual's confidence in understanding and applying health information to maintain their health (Bandura, 1986 in McCaffery et al., 2016). This strengthens the position of health literacy not only as a skill but also as a behavioral determinant that influences action choices in a public health context.

Health literacy indicators are generally constructed based on the dimensions of access, understanding, evaluation, and use of health information (Sørensen et al., 2012). Operationally, these indicators can be broken down as follows:

1. Access to Information: an individual's ability to seek and obtain health information from various sources.
2. Information Comprehension: the skill of understanding medical texts, medication instructions, examination results, or health promotion materials.
3. Information Evaluation: the ability to assess the accuracy, relevance, and credibility of health information.
4. Use of Information: application of information obtained in health decision-making and behavioral actions (eg, medication compliance, preventive measures).

Instruments such as the Health Literacy Questionnaire (HLQ) and Newest Vital Sign (NVS) have been developed to measure these dimensions with high validity and reliability (Osborne et al., 2013; Weiss et al., 2015).

Treatment Compliance

Medication adherence refers to the extent to which a patient's medication use aligns with recommendations from healthcare professionals, including dosage, schedule, and duration (Vrijens et al., 2012). The concept of adherence has become a crucial component of both acute and chronic disease management, significantly impacting therapeutic effectiveness, clinical complications, healthcare utilization, and overall health outcomes (Sabate, 2003; most recently developed by Cutler et al., 2018). Medication adherence is understood not simply as the simple act of taking medication, but as a complex behavior influenced by personal, social, economic, and healthcare system factors.

Theoretically, medication adherence is often studied through health behavior models such as the Health Belief Model (HBM) and the Theory of Planned Behavior (TPB). The HBM explains that an individual's decision to adhere to a therapy regimen is influenced by perceptions of disease susceptibility, severity of consequences, benefits of medical treatment, and perceived barriers (Rosenstock, 1974). Research by Horne et al. (2013) shows that perceived benefits versus barriers are strong predictors of adherence, especially in chronic diseases such as diabetes and hypertension. Furthermore, the TPB emphasizes that pre-action intentions—formed by attitudes, subjective norms, and behavioral control—are determinants of medication adherence (Ajzen, 1991; Khan et al., 2017).

Furthermore, the integration of the socio-ecological model shows that medication adherence is not solely determined by individual factors, but is also influenced by family social support, communication patterns with healthcare providers, and service accessibility (Osterberg & Blaschke, 2005; Brown et al., 2017). This model aligns with the social determinants of health approach, which places social, economic, and cultural systems as the primary contexts influencing adherence behavior.

Medication adherence indicators can be measured through several approaches, both directly and indirectly (Garcia-Perez et al., 2013). Operationally, these indicators include:

1. Consistency Level, Percentage of drug doses consumed by patients according to the prescription in a certain period.
2. Punctuality. The patient's accuracy in following the medication schedule according to the recommended intervals.
3. Duration of Treatment. The length of time the patient follows the therapy regimen as instructed, including not stopping prematurely.
4. Self-Report and Objective Measurement. Such as the MMAS-8 (Morisky Medication Adherence Scale) which has validity in various clinical and community settings (Morisky et al., 2008; Krousel-Wood et al., 2009).

This measurement method is often used in both quantitative research and health program evaluation to determine the level of compliance of the target population.

Disease Prevention Behavior

Disease preventive behavior refers to the conscious actions of individuals or communities to prevent or manage diseases and other health risks before serious clinical conditions occur (Glanz, Rimer, & Viswanath, 2015). These actions include practicing clean

and healthy living (PHBS), vaccination, using personal protective equipment (e.g., masks), regular health check-ups (screening), and adherence to preventive guidelines recommended by health authorities (Sarafino & Smith, 2014).

In public health literature, preventive behavior encompasses not only individual aspects but also social interactions and environmental support, which contribute to its effectiveness (Nutbeam, 2015). Thus, preventive behavior is multidimensional, influenced by cognitive, social, and contextual factors in everyday life.

Several behavioral health behavior theories have been used to explain why individuals choose to adopt or reject disease-preventive behaviors. These include:

1. Health Belief Model (HBM)

   The HBM is the most frequently used theory in the study of preventive behavior. This model suggests that preventive actions are influenced by an individual's perception of:

   - ✓ Susceptibility to disease (perceived susceptibility)
   - ✓ Severity of disease (perceived severity)
   - ✓ Benefits of preventive measures (perceived benefits)
   - ✓ Barriers or costs (perceived barriers)
   - ✓ Self-efficacy or belief in one's own abilities (Champion & Skinner, 2008)

   A meta-analysis study by Carpenter (2010) confirmed that HBM components are consistently related to preventive behaviors such as vaccination and cancer screening.

2. Theory of Planned Behavior (TPB)

   The TPB states that behavior is the result of a person's intentions, which are shaped by attitudes toward the action, subjective norms, and perceived behavioral control (Ajzen, 1991). In disease prevention behavior, the TPB has been used to explain the adoption of health practices such as condom use, mask use, and self-sanitation efforts (Armitage & Conner, 2001; Fishbein & Ajzen, 2015).

3. Social Cognitive Theory (SCT)

   Bandura's Social Cognitive Theory emphasizes that behavior is learned through observation, experience, and social interaction (reciprocal determinism), as well as the role of self-efficacy in guiding preventive action (Bandura, 1986). Modern research integrates SCT with social environment and community structure approaches to explain the adoption of preventive behaviors (Glanz et al., 2015).

In empirical studies, indicators of preventive behavior are generally measured through several dimensions, including:

1. Personal Hygiene Practices. Actions such as proper handwashing, using sanitizer, and other hygiene practices.
2. Vaccination and Immunization. Participation in immunization programs and follow-up vaccinations in accordance with health guidelines.
3. Routine Health Screening. Participate in early screenings such as cancer screenings, blood sugar checks, or blood pressure checks.
4. Adherence to Prevention Guidelines. Preventive measures relevant to the specific disease context (e.g., mask use during a pandemic, social distancing, and environmental sanitation practices).

These indicators are usually measured through self-report behavioral surveys, observational tools, or health service administrative data (Ajzen, 1991; Glanz et al., 2015).

Discussion

Health Literacy as a Determinant of Treatment Compliance

Conceptually, health literacy is understood as an individual's capacity to access, understand, evaluate, and use health information to make informed decisions regarding the care and management of a disease. In the context of medication adherence, health literacy serves as a cognitive foundation that enables patients to understand medical instructions, therapeutic regimens, and the clinical consequences of non-adherence. Individuals with adequate health literacy tend to be better able to interpret information related to dosage, frequency of medication consumption, side effects, and the importance of therapy continuity, particularly for chronic diseases requiring long-term treatment. Thus, health literacy can be positioned as a conceptual determinant that shapes an individual's readiness to consistently engage in therapeutic behaviors (Nutbeam, 2015).

From the perspective of the Health Belief Model, medication adherence behavior is influenced by an individual's perception of disease susceptibility, condition severity, benefits of medical treatment, and perceived barriers. Health literacy plays a role in shaping these perceptions by increasing understanding of the risks and benefits of therapy. Individuals with better health literacy tend to have stronger perceptions of treatment benefits and lower psychological barriers, as they are able to understand the medical rationale behind therapeutic recommendations. Thus, health literacy is not only related to knowledge but also influences the cognitive constructs that underlie health decision-making.

Accordingly, within the Theory of Planned Behavior framework, adherence behavior is influenced by intentions formed from attitudes toward the behavior, subjective norms, and perceived behavioral control. Health literacy can strengthen positive attitudes toward treatment through a more comprehensive understanding of the benefits of therapy. Furthermore, health literacy contributes to increased perceived behavioral control, as individuals feel more capable of managing complex treatment regimens. In this context, health literacy serves as a cognitive resource that strengthens an individual's capacity to translate intentions into concrete actions.

Furthermore, from a Social Cognitive Theory perspective, health literacy is closely related to the self-efficacy dimension. Individuals who have an adequate understanding of their disease and its treatment tend to have higher self-confidence in managing their health condition. This self-efficacy acts as a psychological mediator that strengthens consistent adherence behavior, especially in situations that require long-term discipline. Thus, health literacy not only impacts cognitive aspects but also influences motivational mechanisms and self-regulation.

Empirical findings over the past decade have further strengthened this conceptual argument. Several systematic reviews have shown that low health literacy is frequently associated with medication errors, misunderstanding of medical instructions, and poor adherence in patients with chronic diseases (Berkman et al., 2011). Other studies have shown that patients with better health literacy tend to have more consistent adherence patterns to therapy, particularly in the management of hypertension and diabetes (Osborn et al., 2017; Zhang et al., 2018). These consistent findings indicate that health literacy is a crucial element in the disease management ecosystem, both at the individual and healthcare system levels.

Thus, conceptually and based on a synthesis of previous empirical findings, health literacy can be understood as a fundamental determinant in establishing medication adherence. Efforts to improve adherence are inseparable from strategies to strengthen health

literacy through clear medical communication, needs-based patient education, and simplification of therapeutic information. This approach positions patients not simply as recipients of services but as active actors with the capacity to understand and manage their own health.

Health Literacy as a Determinant of Disease Prevention Behavior

Health literacy conceptually refers to an individual's capacity to obtain, understand, evaluate, and use health information in decision-making that supports health maintenance and disease prevention. In the context of disease prevention behavior, health literacy serves as a cognitive prerequisite that enables individuals to understand health risks, the benefits of preventive measures, and the consequences of neglecting preventive efforts. Individuals with adequate health literacy tend to be better able to interpret information about vaccinations, health screenings, hygiene practices, and infectious disease prevention protocols. Thus, health literacy can be positioned as a conceptual determinant that shapes an individual's orientation toward preventive behavior (Nutbeam, 2015).

From the perspective of the Health Belief Model, preventive behavior is influenced by perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. Health literacy plays a role in shaping these perceptions. Individuals who have a good understanding of disease mechanisms and the effectiveness of preventive measures tend to perceive the benefits of preventive measures as greater than the perceived barriers. Therefore, health literacy serves as a cognitive resource that strengthens the formation of rational perceptions of risks and benefits.

Accordingly, within the Theory of Planned Behavior framework, preventive behavior is influenced by intentions formed from attitudes toward the behavior, subjective norms, and perceived behavioral control. Health literacy contributes to the formation of positive attitudes toward preventive actions by increasing understanding of the urgency and effectiveness of health interventions. Furthermore, individuals with higher health literacy tend to have stronger perceived behavioral control because they feel capable of carrying out preventive actions independently. Thus, health literacy strengthens the psychological mechanisms that bridge knowledge and action.

From a Social Cognitive Theory perspective, health literacy is also closely related to the self-efficacy dimension. A good understanding of health information increases an individual's confidence in their ability to carry out preventive practices, such as maintaining personal hygiene, participating in immunization programs, or undergoing routine health checkups. This self-efficacy is a crucial mediator in the self-regulation process, ensuring that individuals not only know the correct preventive actions but also have the confidence to implement them consistently.

Empirical findings over the past decade support this conceptual argument. Various studies have shown that health literacy is associated with increased participation in health screenings, vaccinations, and healthy living practices (Berkman et al., 2011; Sørensen et al., 2012). Research in the context of the COVID-19 pandemic also shows that individuals with higher levels of health literacy tend to be more compliant with health protocols, such as mask use and social distancing (Zhao et al., 2020). Furthermore, systematic reviews have shown that health literacy contributes to increased risk awareness and the adoption of preventive measures in various population groups, including those with chronic diseases (Paasche-Orlow & Wolf, 2016).

Overall, health literacy can be understood as a fundamental determinant in the formation of disease-preventive behavior. Promotive and preventive efforts in public health require not only the provision of information but also strengthening the community's capacity to understand and utilize that information effectively. Therefore, health literacy-based interventions—through community education, simplified medical communication, and a culturally contextual approach—are relevant strategies for sustainably improving the quality of preventive behavior.

By referring to the research objectives, theoretical studies both empirically and conceptually, and discussions of the relationships between variables, the framework for thinking in this article is compiled as shown below.

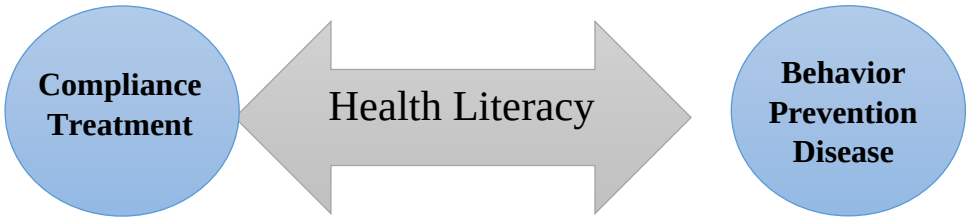

Figure 1. Conceptual Framework

CONCLUSION

This study confirms that health literacy plays a central role in shaping health behaviors, particularly medication adherence and disease prevention behaviors. Conceptually, health literacy serves as a cognitive foundation that enables individuals to understand medical information, evaluate health risks, and make rational decisions regarding therapy and preventive measures. The integration of various health behavior theoretical frameworks demonstrates that health literacy contributes to the formation of risk perceptions, attitudes toward treatment, behavioral control, and self-efficacy, ultimately driving consistent therapeutic and preventive behaviors. The synthesis of previous empirical findings also strengthens the argument that improved health literacy is related to the quality of disease management and participation in preventive measures. Thus, health literacy can be positioned as a strategic conceptual determinant in strengthening promotive and preventive interventions in public health.

While this study provides a comprehensive theoretical integration, there are several limitations that warrant consideration. First, this paper is conceptual and based on a literature review, thus not providing direct empirical testing of the relationships between the variables discussed. Second, most of the empirical references used come from international contexts, so there may be differences in social, cultural, and healthcare system characteristics that could influence the generalizability of the findings to local contexts. Third, this study has not yet thoroughly explored other contextual factors—such as social support, healthcare access, or economic factors—that could potentially interact with health literacy to influence medication adherence and disease prevention behaviors.

Based on these limitations, further research is recommended to conduct empirical testing of the developed conceptual model, using either a quantitative approach with structural analysis or a mixed methods approach to gain a more comprehensive understanding. Future research should also consider mediating or moderating variables, such as self-efficacy, family support, or access to digital information, to enrich understanding of

the mechanisms of the relationship between health literacy and health behavior. Furthermore, contextual studies based on local culture are essential to ensure the model's relevance in Indonesian settings. Developing interventions based on improving health literacy tested through experimental or quasi-experimental designs is also an important agenda to strengthen practical implications for public health policy.

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