



The Impact of Mediators of Health Literacy on Clinical Outcomes in Cardiovascular Diseases

See also page 1728

“Literacy unlocks the door to learning throughout life, is essential to development and health, and opens the way for democratic participation and active citizenship.”¹

Kofi Annan

The importance of literacy in learning, development, and health is underscored by the quote of Kofi Annan. In the context of health care, the concept of health literacy (HL) is defined by the Institute of Medicine as “the degree to which individuals can obtain, process, and understand the basic health information and services they need to make appropriate health decisions.”² In this issue of *Mayo Clinic Proceedings*, Mayberry et al³ report not only the association of HL and clinical outcomes in patients with acute decompensated heart failure (ADHF) or acute coronary syndrome (ACS), but also the effect of patient-level mediators in the causal pathway between HL and clinical outcomes (1-year mortality).

The authors found that 17% to 23% of 2977 patients discharged from the hospital with ACS and ADHF in the Vanderbilt Inpatient Cohort Study (VICS) had low HL, depending on the tool used to measure it. The mortality of the total population was 10% at 1 year. In addition, lower HL was independently associated with reduced overall health, worse health behaviors, lower social support, and more hospitalizations. However, HL was not independently associated with comorbidities. Mediators of HL such as health competence, health behavior, comorbidities, previous-year hospitalizations, and cardiovascular disease (CVD) diagnosis (either ACS with a congestive heart failure history or ADHF at the index hospitalization) each independently predicted mortality outcomes, but social support did not. The authors conclude that patient-level factors such as health competence and health

behavior are key determinants in the relationship between low HL and mortality and could be targeted by interventions to improve clinical outcomes.

Based on these and related data, the authors recommend that clinical evaluation of and strategies to improve HL not only will decrease mortality and morbidity in patients with heart failure but also may assist in designing individualized interventions in this patient population.

We review briefly the clinical importance of HL on clinical outcomes, highlighting the significance of studying the potential mechanisms or causal pathways by which HL affects outcomes in CVDs.

Conceptual Models of HL

Several survey studies have estimated that the prevalence of low HL is 36% in the United States⁴ and 29% to 62% in European countries.⁵ The presence of low HL is costly and is associated with poor outcomes, such as lower self-rated health, reduced quality of life, a higher rate of hospitalization, use of emergency services, and all-cause mortality.⁶ Thus, HL is a major health challenge of the 21st century.⁶

Studies have found that aging, language barrier, low educational level, low socioeconomic status, and presence of chronic diseases are important risk factors associated with low HL.^{7,8} Moreover, although low HL is clearly associated with worse clinical outcomes and socioeconomic characteristics, the causal pathways by which this occurs are not entirely known. The mechanisms by which HL affects clinical outcomes are centered on different levels, including those that are patient-centered and others that involve aspects of the health care system. A growing consensus suggests that HL research should focus less on descriptive studies and more on the

development and testing of interventions.^{9,10} This requires the creation of HL conceptual models to understand how interventions can achieve better health outcomes in people with low HL.

Several models have been proposed. Baker's model highlights several factors, such as the difficulty of both printed and spoken health information and cultural customs relevant to health outcomes.¹¹ The conceptual model proposed by Paasche-Orlow and Wolf¹² includes socioeconomic indicators that influence HL: level of education, ethnicity, age, occupation, and income. Their model distinguishes 3 types of health action that mediate the impact of HL on health: access to and utilization of health care, patient–provider interaction, and self-care. von Wagner et al¹³ propose that associations between HL and health outcomes may be mediated by a range of health actions involving access to and use of health care, patient–provider interactions, and the management of health and illness.

Some of these models focus mainly on identifying associations between HL and its determinants and outcomes. Models focused on identifying targets for interventions are scarce, and those available are of limited comprehensiveness. Thus, a comprehensive HL intervention model was designed by 68 HL experts.⁹ This model conceptualized interventions as potentially targeting 5 factors affecting HL: (1) personal characteristics of individuals, (2) their social context, (3) communication between individuals and health professionals, (4) the HL capacities of health professionals, and (5) health care systems. Importantly, this model accommodates continued development of HL interventions intended to improve the health outcomes of people with low HL.⁹

The article by Mayberry et al³ supports previous findings that low HL is associated with higher mortality rates in patients with ACS and acute heart failure in the VICS. However, the authors go a step further by evaluating the causal mediators of low HL. Although the authors do not include access to care, the interaction between provider and patient, and self-care, socioeconomic, and demographic factors as risk factors of low HL, they demonstrate that HL mediators such as health competence and health behavior are

important determinants of HL, independent of clinical risk factors (ie, comorbidities, CVD diagnosis, and previous hospitalizations).

Clinical Implications

The study by Mayberry et al³ is clinically significant in at least 3 salient ways. First, the VICS supports once more the importance of measuring HL in patients with CVD as well as its relationship with outcomes. Second, the relationship between health competence and health behavior and outcomes independent of clinical factors suggests that interventions that improve perceived health competence and health behaviors will, concomitantly, improve outcomes. Such interventions may include health coaching for smoking cessation and dietary modifications, cardiac rehabilitation for individualized exercise programs, and counseling for treatment of alcohol abuse.

Third, patients with low HL during hospitalization should be assessed for perceived health competence and health behaviors to deliver appropriate targeted interventions.

In summary, the studies by Mayberry et al³ add to the growing literature that attests to the impact of HL on outcomes in CVDs and identifies HL as a target for interventions designed to improve outcomes. This therapeutic approach encompasses effective patient–physician communication, accurate assessment of a patient's HL, meaningful and feasible strategies designed to improve HL, and team-based management. Addressing and intervening on low HL may enable the introduction of salutary behaviors and lifestyle, as well as the avoidance of potentially harmful ones. As Steven Pinker said, “If you give people literacy, bad ideas can be attacked and experiments tried, and lessons will accumulate.”¹⁴

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