

Functional Health Literacy and Medication Use: the Pharmacist's Role

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Ann Pharmacother 2003;37:1726-9.
Published Online, 10 Sept 2003, www.theannals.com
DOI 10.1345/aph.1D070

A 66-year-old man comes to the urgent care unit experiencing shortness of breath. He is found to be in rapid atrial fibrillation and is admitted to the hospital. Once his heart rate is controlled, he is started on warfarin. He is discharged home with verbal and written instructions to take three 1-mg warfarin tablets alternating with four 1-mg tablets daily. He does not show up for his clinic appointments, and 2 weeks later presents to the emergency department with melena and syncope, an international normalized ratio (INR) of 39, and a hematocrit of 21%, and is admitted to the intensive care unit. His primary physician discovers that the patient had been taking both sets of warfarin tablets daily. The patient states that he did not ask questions at discharge because "everyone was so busy." The patient did not tell anyone that he could not read the medication instructions or his clinic appointment slips.

At a clinic visit, a physician instructs a young mother to give her 2-year-old daughter 12 1/2 mL of prednisone liquid daily. The pharmacy instructions on the medication label read "Give 2 1/2 teaspoons of prednisone daily." The mother returns to the pharmacy in a couple of days for more medication and the pharmacy staff discovers that she has been giving her daughter 12 1/2 teaspoons of prednisone daily.

The 1993 National Adult Literacy Survey reported that 40 million Americans could be considered illiterate and another 50 million had marginal literacy skills and could be considered functionally illiterate.¹ The cases described above illustrate medication errors that occurred either because the patients could not read well and/or they did not

comprehend the instructions of how to take or administer prescribed medications.

For the purposes of this article, it is important to distinguish the differences between literacy and functional health literacy (FHL). The National Literacy Act of 1991 defines literacy in the US as "an individual's ability to read, write, and speak English and compute and solve problems at levels of proficiency necessary to function on the job and in society, to achieve one's goals, and to develop one's knowledge and potential."²

FHL is a measure of a person's ability to perform basic reading and numeric tasks in the healthcare context, such as reading insurance forms and medication labels, and performing mathematical tasks associated with taking medications (numeracy).^{3,4} The Test of Functional Health Literacy in Adults (TOFHLA) is a validated measure of literacy skills in the healthcare context, used primarily in clinical research.⁵ Patients with adequate FHL are more likely than patients with inadequate FHL to read, comprehend, and act on written healthcare information as intended by their provider. FHL may also be a marker of how well a patient can successfully navigate the demands of the current healthcare system.

The prevalence of inadequate FHL is reported to be particularly high in elderly, low-income, and minority patients, with rates of over 50% in public hospitals and clinics and over 33% among Medicare recipients.^{6,7} A body of research exists demonstrating that patients with inadequate FHL have worse health status, problems communicating with healthcare providers, poorer knowledge of their chronic disease state, are at increased risk of hospitalization, and are more likely to be confused about medications.⁸⁻¹⁴

The purposes of this article are to (1) discuss what is known about the relationship between FHL and medication use, (2) describe the challenges of inadequate FHL and medication adherence assessment, (3) discuss the importance of FHL and promoting medication adherence, and (4) describe the role of pharmacists in addressing this issue.

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Schillinger's contribution was funded, in part, through a grant from the Open Society Institute Medicine as a Profession Fellowship.

Functional Health Literacy and Medication Use

To properly perform tasks associated with proper medication use, patients must possess adequate FHL skills. Patients are required to read medical information and comprehend what to do and when to do it. Patients may be required to perform numeric tasks such as calculating the number of tablets for a single dose of medication. Patients are expected to monitor themselves for both beneficial and adverse effects, know what to do if they miss a dose of medication, and master when, if, and how to obtain refills of their medication.

Research has shown that patients with inadequate FHL have problems not only with reading but also with comprehending and integrating information as intended by their healthcare provider.^{15,16} Much of the communication between pharmacists and patients regarding proper medication use relies on the written word, supplemented by brief oral instructions. On average, adults read 4–5 grades lower than their stated level of education; studies have revealed a gap of more than 5 years between most patients' reading capacities and the reading levels required to understand written educational materials.¹⁷

Studies in a variety of healthcare settings suggest that patients with inadequate FHL have difficulties with what most healthcare professionals would consider basic medication instructions. A study of 2659 urban public hospital patients, a majority of whom had inadequate FHL, examined patients' understanding of numeracy questions related to medication use and the frequency of patients' abilities to carry out medication directions as intended.⁶ Forty-two percent of patients gave incorrect answers for "how to take a medication on an empty stomach," 33% for "how many pills of a prescription should be taken," and 23% for "how many times a prescription can be refilled."

A survey of 483 public hospital patients with asthma was conducted to determine the relationship of FHL, asthma knowledge, and the correct use of a metered dose inhaler (MDI).¹¹ Patients with inadequate FHL were less likely to answer asthma knowledge questions correctly and more likely to demonstrate poor MDI technique compared with those with adequate FHL. After adjusting for age, duration of asthma, health status, and insurance status, FHL was the strongest predictor of asthma knowledge and proper MDI technique. The results of these studies suggest that even "simple" instructions require further clarification and that FHL may influence the extent to which patients act on routine medication instructions.

Functional Health Literacy and Medication Assessment

Assessment of medication adherence is an important part of providing pharmaceutical care. Unfortunately, there is no gold standard to assess medication adherence. The most commonly used assessment techniques are pill counts, patient self-report, and the Medication Event Monitoring System. Medication nonadherence is a common problem, particularly for patients with chronic diseases. Factors affect-

ing adherence include age, knowledge of medical condition, the number of medications, dosing frequency, complexity of administration, and adverse effects experienced.^{18,19}

Limited published information exists describing the role of FHL in the medication adherence process. One study examined the association between FHL and adherence to HIV/AIDS therapy regimens.²⁰ After controlling for age, ethnicity, income, HIV symptoms, substance abuse, social support, emotional distress, and attitudes toward primary care providers, FHL was found to be an independent predictor of medication adherence. Patients with inadequate FHL were more likely than patients with adequate FHL to miss treatment doses due in part to confusion, depression, and conflicting health beliefs.

Inadequate FHL may be a barrier to assessing medication adherence because these patients are more likely to have difficulties accurately reporting to pharmacists the drugs they are currently taking. A recent study among patients taking warfarin in a pharmacist-run anticoagulation clinic demonstrated that patients with inadequate FHL were less likely than patients with adequate FHL to articulate their weekly warfarin regimen accurately.²¹ Of note, providing patients with a simple visual aid (a digitized, color warfarin pill menu from which patients could identify their doses) significantly reduced the FHL-related disparities in warfarin regimen accuracy.

A pharmacist's assessment of a patient's level of FHL could be beneficial to tailoring medication-counseling strategies. Currently, there is no published evidence supporting routine assessment of FHL in the clinical setting.²² Asking patients "Can you read?" to determine literacy levels has limitations, since most patients are not willing to disclose that they have reading problems because of fear and embarrassment or are unaware that they have reading limitations.²³ Until evidence becomes available, administration of a test such as TOFHLA in a clinical setting remains unclear.⁵

Promoting Medication Adherence

Most medication adherence interventions consist of a combination of written and verbal communication to convey to patients how to carry out medication-related recommendations. While experts recommend that written patient educational materials be designed for low-literacy patients, research in this area has yielded mixed results. Patient information sheets written at grade 5 level may be readable by most patients, but may not improve a patient's comprehension of the written words or alter behavior.²⁴ A study of an intervention to increase pneumococcal vaccination rates found that, when patients with inadequate FHL were involved in the design and pilot-testing of the educational tool, vaccination rates increased.²⁵ This would suggest that, for an educational intervention to be most effective, it must be designed to meet patients' reading levels and developed and tested with the priority population.

Verbal communication must be modified for patients with inadequate FHL. There are many factors that impact

the quality and effectiveness of medication counseling such as the amount of time spent counseling patients, physical space, and pharmacists' communication skills. Such factors may be particularly relevant when counseling patients with inadequate FHL. Providers should avoid asking, "Do you understand?", as many patients are uncomfortable admitting poor comprehension or are unaware of gaps in communication. Using the "teach-back" method with all patients and incorporating the questions of the Indian Health Service Model²⁶ is still a reliable method to determine to what extent a patient understands the instructions for taking a medication. It is important to keep in mind that these questions may require further modification when counseling patients with inadequate FHL. A recent study among diabetes patients at a public hospital showed that physicians rarely employ the "teach-back" method with their patients.²⁷ Physicians explicitly elicited patients' recall or comprehension of instructions, including medication changes, only 12% of the time. Of note, patients whose physicians did employ this method had better glycemic control.

In addition to written and verbal methods, pharmacists can use a variety of visual media such as charts, calendars, picture books, videotapes, and pictographs to explain medication instructions. Research has shown that the combination of pictographs with verbal counseling can increase the recall of medical information in patients with inadequate FHL.²⁸

Pharmacists' Role

CLINICAL SETTINGS

Pharmacists are an accessible resource for medication information. Pharmacists may be the first healthcare providers to recognize that a patient has inadequate FHL. Pharmacists must consider FHL when counseling patients about new medications or changes in medications and determining reasons for nonadherence.

In an attempt to provide continuity of pharmaceutical care to patients, the professional relationships and communication that occur between pharmacists within and across healthcare settings are crucial. These interactions can serve as opportunities for pharmacists who practice in hospitals and clinics to provide key information about patients who may have inadequate FHL to community pharmacists to assist them in providing effective medication counseling.

TRAINING

Increasing awareness that a considerable proportion of patients may have inadequate FHL is critical. The National Work Group on Health and Literacy recommends that pharmacists and student pharmacists be educated about the relationship between literacy and health and how to effectively communicate medication information to patients with inadequate FHL.²⁴

In pharmacy schools, while individual lectures on FHL may be helpful, awareness of inadequate FHL and the impact of FHL on management of drug therapy needs to be

woven into the entire pharmaceutical care curriculum. Time should be devoted to update and improve communication skills needed to partner with patients with inadequate FHL.

RESEARCH AND POLICY

Research is needed to modify existing and develop new interventions that take FHL into account. Pharmacists are ideally positioned to participate in research aimed at clarifying the mechanisms by which FHL impacts a patient's health status and testing interventions to improve clinical outcomes. Cost-effectiveness studies will also be necessary to demonstrate the value of such interventions.

Pharmacists should participate in ongoing FHL-related advocacy initiatives that seek to bring to the forefront the needs and concerns of patients with inadequate FHL and create systemic solutions. Pharmacists should be part of the effort to educate policy makers about FHL and its impact on health care. The pharmacy profession should support policy changes in the healthcare system, participate in the creation of FHL-related quality measures, and assist in the development of standards to better serve the needs of patients with inadequate FHL. California Literacy, Inc.,²⁹ an adult literacy organization, is spearheading a multidisciplinary statewide Health Literacy Initiative to address these issues.

Summary

FHL is an important public health and clinical issue. The assessment and promotion of medication adherence for patients with inadequate FHL presents unique challenges to pharmacists and other healthcare providers. The pharmacy profession has an obligation to increase awareness, educate its membership, and advocate for innovation in healthcare communication. Further research is needed to fully understand the impact of FHL on safe and appropriate medication use, to develop adherence assessment tools and adherence-promoting interventions, and evaluate their impact on clinical and economic outcomes.

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