Screening for Literacy and Readability: Implications for the Advanced Practice Nurse
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Abstract

The National Adult Literacy Survey reported that 44 million adult Americans could not read or write well enough to meet the needs of everyday living and working. Low literacy is more prevalent than the average nurse is aware, and often the written materials given to patients are above their reading level and therefore are misunderstood. This article defines literacy and describes literacy screening tools and readability formulas. Recommendations for including assessment of literacy and readability as essential activities of the advanced practice nurse (APN) are presented. The APN can be instrumental in providing leadership and directing education, thus ameliorating the effects of low literacy.

The 1993 National Adult Literacy Survey reported that 44 million adult Americans could not read or write well enough to meet the needs of everyday living and working.1 The estimated rate of illiteracy among the adult population in the United States ranges from 13% to 55%.2 Low literacy may be a barrier to receiving adequate healthcare. Patients must be able to understand appointment slips, instructions for tests, directions for self-care, informed consent, prescription labels, and other health education materials. Low literacy contributes to noncompliance if the patient has a limited ability to read and understand healthcare instructions. To compound the problem, most patient education materials are written above the eighth-grade level.3,4 Consequently, many written materials given to patients for health education are above their reading level and are therefore not understood.3 This creates a problem for healthcare professionals, especially nurses, who spend a significant portion of their time in teaching-learning activities.5

This article will define literacy, describe tools used for literacy screening and formulas for assessing the readability of educational materials, and recommend intervention strategies for the advanced practice nurse (APN).
The Joint Commission on Accreditation of Health Organizations (JCAHO) has mandated that patients receive instructions on a level that they can understand. Healthcare organizations must provide education specific to the patient's assessed needs, abilities, and readiness. Then they must assess how well the patient understands the instructions. To comply with this mandate, documentation in the medical record should reflect the education provided and evaluate the effectiveness of the educational intervention.

According to the American Hospital Association's Patient's Bill of Rights (1972), patients have the right to receive complete, current information concerning diagnosis, treatment, and prognosis in terms they can reasonably be expected to understand. Healthcare professionals have traditionally relied on printed educational materials as a cost-effective and time-saving means to communicate with patients. However, educating patients through written materials creates a problem when the target population includes a high percentage of patients who are illiterate or who have low levels of literacy.

DEFINITIONS

According to the National Literacy Act of 1991, literacy is defined as the ability to read, write, and speak English and solve problems at levels necessary to function in jobs and society. Webster's defines literacy as the ability to read and write. The commonly accepted definition of literacy is the ability to read, understand, and interpret information written at the eighth-grade level or above.

Illiteracy is the total inability to read or write. Fewer than 5% of United States residents are illiterate.

Low literacy in adults refers to the ability to read, write, and comprehend information between the fifth-and eighth-grade levels.

Functional illiteracy refers to the ability to read, write, and comprehend below the fifth-grade level. Adults cannot read well enough to understand and interpret what they have read or use the information correctly. Nationwide, almost two out of five adults ages 65 and older read below the fifth-grade level.

Groups identified as having poorer reading and comprehension skills than the average American are the economically disadvantaged, immigrants (especially illegal ones), and high school dropouts. Racial minorities of blacks, Latinos, and Native Americans; the unemployed; and inner-city residents often have lower literacy levels. Also included are Southerners, especially residents of Louisiana, Texas, and Mississippi; these states have the highest rates of functional illiteracy in the nation.

SCREENING FOR LITERACY LEVEL

Assessment of adult literacy is necessary for healthcare educators when the intended outcome is to select appropriate teaching interventions rather than labeling a patient. Parikh et al. have hypothesized that many patients with low literacy may not admit they have difficulty reading because of shame. They found that patients had never told their spouse (67.2%) or children (53.4%) of their reading difficulties; 19% of patients had never disclosed their difficulties to anyone. Illiteracy carries a stigma and creates feelings of inadequacy, fear, and low self-esteem. Healthcare providers must maintain sensitivity and confidentiality regarding a patient's literacy level to avoid increasing the patient's feelings of shame.

A variety of screening tools are available to assess a patient's reading ability. Word recognition has been reported as a valid indicator of adult reading ability. Frequently used tools to indicate reading ability are the Wide Range Achievement Test (WRAT), the Test of Functional Health Literacy in Adults (TOFHLA), or the newly developed Rapid Estimate of Adult Learning in Medicine (REALM(C). Table 1 compares these screening tools.

WRAT

The WRAT, a word recognition screening test, was developed in 1936 and has been revised four times. The WRAT consists of a list of 100 words that the patient is asked to pronounce. When three words are mispronounced, the test is stopped and scored by the number of words missed or not tried. This number is subtracted from the total number of words to get a raw score, which is converted to a grade equivalent. The WRAT can be completed and scored in 5 minutes or less. Its validity and reliability have been well documented.

| Table 1 |
The WRAT is composed of three subscales: spelling, reading, and arithmetic. Each subscale is divided into two age groups: 5 to 11 years and 12 years and older.

The WRAT is limited to measuring word recognition in English-speaking patients only. It is useful in determining the difficulty of words used when selecting educational materials.

TOFHLA
TOFHLA was developed to assess patients’ functional health literacy using actual materials from the hospital setting, such as prescription labels, appointment slips, and informed consent, not just isolated words. The test consists of two parts: reading comprehension and numeracy. The reading comprehension portion is a 50-item test using a modified Cloze procedure—every fifth to seventh word in a passage is omitted, and four possible options are provided. The patient chooses the option that best fits the passage and receives one point for each correct answer. The numeracy section is a 17-item test using actual hospital forms and labeled prescription vials. The test assesses ability to read and comprehend directions for taking medications, monitoring blood glucose, keeping appointments, and obtaining financial assistance. The numeracy score is then multiplied by a constant (2.941) to create a score from 0 to 50. The numeracy and reading comprehension scores equal 0 to 100. The total TOFHLA score is divided into three categories: inadequate, marginal, and adequate. A patient scoring 59 or less is considered to have inadequate functional health literacy. A patient scoring 60 to 74 is considered to have marginal functional health literacy. Patients with scores greater than 75 are considered to have adequate functional health literacy.

TOFHLA has demonstrated reliability and validity in assessing patients’ functional health literacy. It requires up to 22 minutes to administer and is a better research tool than a clinical tool. A Spanish version is available (TOFHLA-S).

REALM
REALM is a 66-word reading recognition test that measures a patient’s ability to pronounce common medical and lay terms for body parts and illnesses (Fig. 1). The terms are arranged in three columns beginning with short, easy words and ending with more difficult words. Patients are asked to begin at the top of the first column and to read down, pronouncing all the words they can from the three lists. The total number of words pronounced correctly is the raw score, which is converted to a grade, ranging from the third grade and below to ninth grade and above. REALM can be used to screen for low literacy in 2 to 3 minutes and could become part of the initial assessment procedure. REALM’s advantages over WRAT are that it measures a patient’s ability to read medical and health-related vocabulary, it takes less time to administer, and the scoring is simpler.

NURSING ACCOUNTABILITY
Assessing for literacy levels only partially fulfills JCAHO’s patient education requirements. Based on the assessment, the nurse must select materials based on literacy level, revise the materials, document assessments and interventions, and evaluate the patient learning outcomes. The assessment provides nurses with information to assist them in selecting the materials and methods most appropriate for teaching each patient. Hospital staff must be properly trained by those in the educational field to use teaching methods appropriate for each reading level, or teaching will be ineffective. Nurses must protect patients’ privacy by maintaining strict confidentiality. Overall, screening adds to the cost of care based on the extra time needed for the screening and the cost for materials. The institution must provide a wider range of educational materials based on literacy level: “one size fits all” no longer applies.

READABILITY OF EDUCATIONAL MATERIALS
Doak et al. recommended that all written materials be tested for readability to ensure they fit the patient’s literacy level. The most widely used readability formulas are the Flesch formula, the FOG Index, the Fry formula, and the SMOG (Table 2).
Flesch Formula
The Flesch formula was developed as an objective measurement of the readability of materials between grade five and college level. This formula is based on a count of two basic language elements: average sentence length and average word length. The reading ease score is calculated by combining the variables. The Flesch formula's validity has been well established.

Fog Index
The Fog Index was developed by Gunning in 1968 to evaluate the readability of materials from the fourth grade to college level. The formula is based on the average sentence length and the percentage of multisyllabic words in a 100-word passage. The index is considered one of the easiest methods because it is based on a short sample of words and does not require counting syllables.

Fry Formula
The Fry formula is widely accepted among reading professionals and is not copyrighted. This formula is applicable to grades 1 through 17. Three 100-word passages are selected and the number of sentences are counted, along with syllables. Data are evaluated by a Fry graph, which converts totals to grade level (Fig. 2).

SMOG
G.H. McLaughlin developed the SMOG formula in 1969. It is regarded as one of the simplest and most accurate and valid analyses of readability. Its popularity is based on its reading-level accuracy, simple directions, and speed of use. The SMOG formula is based on 100% comprehension of material read and has been used extensively to judge the grade-level readability of patient education materials. The SMOG measures readability based on the number of polysyllabic words in a set number of sentences. The square root of the total number of polysyllabic words, estimated to the nearest perfect square, is added to 3 and then converted using a table to define the grade level needed for comprehension.

SAM
Often, healthcare providers have difficulty assessing healthcare education materials. Doak et al. helped to develop and validate Suitability Assessment of Materials (SAM) with authors from the Johns Hopkins School of Medicine. SAM was designed to evaluate printed materials and illustrations but has also been used with audio and visual materials. The SAM score is given as a percentage; materials are superior, adequate, or not suitable. SAM contains six areas for evaluation: content; literacy demand; graphics; layout and typography; learning stimulation or motivation; and cultural appropriateness. The maximum possible score is 44 points, or 100%.

By assessing the readability or suitability of printed educational materials, nurses are more likely to provide instructions that patients understand. With a large, diverse group of patients, materials written at levels above the ninth grade should be rewritten to make them understandable for those with lower reading levels. The goal is to match the literacy level of patients with the appropriate level of materials. Supplemental teaching may be required with any written material, and evaluation is necessary to verify comprehension.

ROLE OF THE ADVANCED PRACTICE NURSE
The APN should take a leadership role in developing a broader selection of materials appropriate for low-literacy adults. The APN can increase staff awareness regarding the issue of literacy and its effect on healthcare through educational programs. Educating the staff on screening tools to assess reading ability, such as the WRAT or REALM, can be included in this educator role. The APN can assess printed material for its readability using the Fry, SMOG, or SAM tools. Readability formulas should be used to determine the difficulty level of educational materials, so the APN can screen materials and appropriately match them with the reading ability of each patient.
APNs can serve as consultants and educators in cases of noncompliance with plans of care. Estimates show that 25% to 50% of geriatric patients are noncompliant with their medications.14,15 Low literacy contributes to noncompliance because patients have limited ability to organize their thoughts regarding medication instruction.15 Low-literacy patients are likely to indicate that they understand even when they do not. A patient's low literacy level may be hidden to prevent shame and embarrassment.11 Low-literacy patients may not follow instructions because of a lack of understanding, not because they were deliberately noncompliant.

Following directions for medication administration is especially important for special populations such as those with diabetes, cancer, hypertension, and cardiac and respiratory disease. Noncompliance with medication regimens accounts for 11.4% of hospitalizations in older persons. Medication compliance is important to the maintenance of health and the control of disease processes in the geriatric population.16

Creativity and innovative teaching strategies are a must with low-literacy patients. Alternatives to written teaching materials include short audiotapes and videotapes.3 Charts, pictures, diagrams, or single-concept flip charts can be effective.17 Demonstrations, hands-on practice, and discussions can be useful tools to enhance learning.3,17

**CONCLUSION**

Low literacy is a prevalent problem in healthcare. Nurses are responsible for health education, which is mandated by JCAHO. Therefore, assessment of literacy and readability is an essential activity of the APN. The APN has a professional obligation to ensure that the patient clearly understands the material presented. The APN can be instrumental in promoting literacy in healthcare by using screening procedures and analyzing the readability of educational materials.

**REFERENCES**


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