SCIENTIFIC ARTICLE

Readability of Patient Education Materials in Hand Surgery and Health Literacy Best Practices for Improvement

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Purpose This study aimed to update a portion of a 2008 study of patient education materials from the American Society for Surgery of the Hand Web site with new readability results, to compare the results to health literacy best practices, and to make recommendations to the field for improvement.

Methods A sample of 77 patient education documents were downloaded from the American Society for Surgery of the Hand Web site, handcare.org, and assessed for readability using 4 readability tools. Mean readability grade-level scores were derived. Best practices for plain language for written health materials were compiled from 3 government agency sources.

Results The mean readability of the 77 patient education documents in the study was 9.3 grade level. This reading level is reduced from the previous study in 2008 in which the overall mean was 10.6; however, the current sample grade level still exceeds recommended readability according to best practices.

Conclusions Despite a small body of literature on the readability of patient education materials related to hand surgery and other orthopedic issues over the last 7 years, readability was not dramatically improved in our current sample. Using health literacy as a framework, improvements in hand surgery patient education may result in better understanding and better outcomes for patients seeing hand surgeons.

Clinical relevance Improved understanding of patient education materials related to hand surgery may improve preventable negative outcomes that are clinically significant as well as contribute to improved quality of life for patients. *(J Hand Surg Am. 2016;■(■):■−■.*

Key words Health literacy, readability, hand surgery, patient education.

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HEALTH CARE PROVIDERS, INCLUDING hand surgeons, often aim to improve outcomes related to surgery by educating their patients with written information provided in print or on the Internet. Written health information can include medical instructions, prescription medication information, health education about self-care behaviors and treatment options, patient history and admission forms, and informed consent materials. Understanding of these documents is crucial to increase compliance with

postoperative care instructions and minimize harm after surgery.

Patient education is often evaluated by how easy or difficult it is to understand through a readability assessment. Readability is defined as the determination, by systematic formulas, of the reading comprehension level a person must have in order to understand written materials.[1] Readability formulas typically use word and sentence length and written content structure to report a grade-level readability score, meaning that the grade level of the document is the grade level the reader should have to fully read and understand it.

Although there is a plethora of patient health education materials available to hand surgery patients, previous research has demonstrated that the information in these materials is often difficult to understand for a typical patient. A study conducted in 2008 reported the average grade-level readability scores for materials from the American Academy of Orthopaedic Surgeons and American Society for Surgery of the Hand (ASSH) patient education Web sites to be between 8.5 and 10.8 when results are combined.[2] More recent studies have reported readability between grades 10 and 15 (college) for major surgery subspecialty Web sites,[3] carpal tunnel materials,[4] and DeQuervain tendinitis.[5]

This study aimed to update a portion of the 2008 study of patient education materials from the ASSH patient education Web site with new readability results, to compare the results to health literacy best practices, and to make recommendations to the field for improvement. Using health literacy as a framework, improvements in hand surgery patient education may result in better understanding and better outcomes for patients seeing hand surgeons.

MATERIALS AND METHODS

Patient education materials were downloaded from the ASSH HandCare website.[6] In total, 77 patient education documents were obtained and assessed for readability including 56 documents on conditions and injuries, 14 documents on procedures and treatments, and 7 documents on hand safety. These included all patient education materials that were available online at the time of the study.

Assessment was performed using free, open-source readability tools found online at www.readabilityformulas.com.[7] The documents were converted into new Microsoft Word documents and cleaned for use in the open-source readability tools. Document preparation and cleaning included removing photographs and other graphics. Captions associated with graphics were used in the assessment, but words found within the graphic/image, such as labels, were not. Titles and headings were removed if they contained fewer than 5 words. If they contained 5 or more words, punctuation was added so that titles and headings would be included in the assessment. Titles and headings that contained punctuation were included in the assessment regardless of length. Bullets and numbers found in lists were removed. If the bulleted points were part of a list in the sentence preceding it, then the first point in the list was combined with the leading statement. Punctuation was added to all other bulleted points. Periods were removed from the text if they were not placed to terminate a sentence, as in abbreviations. Web addresses and symbols were also removed.

Four formulas were used to determine the readability of each individual document: Flesch-Kincaid Grade Level,[8] SimpleMeasure of Gobbledygook (SMOG) Index,[8] Fry Readability Graph,[9] and New Dale-Chall score.[10] The Fry and Flesch-Kincaid Grade Levels represent the years of education required to understand most of the text. The SMOG Index represents the reading grade level necessary for a person to have completed in order to fully understand the text. The New Dale-Chall score represents the years of education required to understand text above third grade based on a list of 3,000 words. Because readability scales calculate scores differently, results may vary, typically within a narrow range. However, all of these scales report results in years of education (based on the US educational system) required to easily read and understand the document; therefore, a mean readability score was derived from the results of each scale, as in the 2008 study.

The open-source readability tools limit the amount of text assessed to blocks ranging from 300 to 600 words. If a document was longer than 600 words, it was broken down into blocks of text falling within this range. Each block was then transferred into the readability assessment tool. Results were displayed numerically for the Flesch-Kincaid grade level, SMOG index, and New Dale-Chall score. Results for the Fry grade level were displayed on the Fry graph. If the output was on the line between 2 grade levels, it was identified as both grade levels. If results from the Fry formula did not fall on the Fry graph, the results were verified manually with the extended Fry graph.[11] This was performed by manually plotting the average number of syllables per 100 words against the average number of sentences per 100 words that was given in the assessment results.