Readability of online patient resources for melanoma

Ahmed M.S. Ibrahim*, Christina R. Vargas*, Pieter G.L. Koolen, Danielle J. Chuang, Samuel J. Lin and Bernard T. Lee

Medical information is often difficult for patients to understand. With specialized vocabulary and complex pathophysiology, even well-educated adults have trouble interpreting information about their healthcare. The average American adult reads at a seventh-grade level. In light of the inherent complexity of health information, the American Medical Association and National Institutes of Health have recommended that information for patients should be written at a sixth-grade level. The goal of this study was to evaluate the most commonly used online patient resources about melanoma in the context of these recommendations. A web search for 'melanoma' identified the 10 most-accessed websites. Location filters were disabled and sponsored results were excluded to avoid inadvertent search bias. All relevant, patient-directed articles were downloaded and formatted into plain text. Pictures, videos, links, advertisements, and references were removed. Readability analysis was carried out using 10 established tests, both overall and arranged by parent website for comparison. A total of 130 articles for melanoma information were identified. The overall mean reading grade level was 12.6. All sites exceeded the recommended sixth-grade level. Secondary analysis of articles grouped by website indicated a range of readability across sites from 9.9 (high school freshman) to 14.9 (university sophomore). Online patient resources for melanoma uniformly exceed the recommended reading level and may be too difficult for many Americans to understand. The range of readability among websites may indicate an opportunity for physicians to direct patients to more appropriate resources for their level of health literacy. *Melanoma Res* **26:58–65**

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Department of Surgery, Harvard Medical School, Beth Israel Deaconess Medical Center, Division of Plastic Surgery, Boston, Massachusetts, USA

Correspondence to Bernard T. Lee, MD, MBA, MPH, 110 Francis Street, Lowry Suite 5A, Boston, MA 02215, USA
Tel: +1 617 632 7835; fax: +1 617 632 7840; e-mail: btlee@bidmc.harvard.edu

*Ahmed M.S. Ibrahim and Christina R. Vargas contributed equally to the writing of this article.

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Introduction

Melanoma is the fifth most common cancer in the USA, and accounts for up to 75% of skin cancer-related deaths [1, 2]. As the incidence of melanoma has increased over the past few decades, patient education on early detection, heritability, and modifiable risk factors is critical [3]. Comprehending the complex development of malignancy, clinical and pathologic diagnosis, and subsequent management strategies for melanoma can be difficult. With inherent specialized vocabulary and complex pathophysiology, even the most well-educated patients may struggle to keep up and participate fully in their care following the diagnosis of melanoma. Furthermore, the educational materials currently available may be too advanced for the typical level of understanding [4]. Previous studies have found that inadequate health literacy is correlated with poor disease state control, insufficient medication adherence, and increased mortality [5]. Moreover, the negative impact of inadequate cancer health literacy extends to include family caregivers who play an important role in the process of diagnosing, treating, and surviving cancer [6].

A majority of adult Americans today use the internet to better understand conditions that afflict them. In 2008, the Pew Internet and American Life project found that 80% of internet users searched online for health information [7]. As a result, numerous entities now offer website sections aimed toward patient education. However, these are often written at a level that may not be appropriate for the typical patient. The findings of a recent study indicated that the average American adult reads at a seventh-grade level [8]. The US Department of Education's National Center for Education Statistics reported that, on the basis of a national assessment of adult literacy for healthcare-oriented language, only 12% of the population showed proficiency and 36% scored at or below the basic level [9]. Previous studies spanning different surgical specialties and evaluating the readability of patient education materials have found them to be higher than the recommended reading level for such materials, suggesting that this is a widespread issue [10–15]. In light of these data, the American Medical Association (AMA) and the National Institutes of Health (NIH) have recommended that information for patients be written at a sixth-grade level [16,17].

Numerous assessment tools exist than can be used to analyze the readability of a document. The most commonly used are the Flesch Reading Ease (FRE) Formula, which determines the ease of reading on a scale of 1–100 (the higher the number, the greater the ease of reading), and the Flesch–Kincaid Grade Formula, which calculates the mean number of years of education

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