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Assessment of online patient materials for breast reconstruction

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ABSTRACT

Background: Limited health literacy affects nearly half of American adults and adversely affects patient participation, satisfaction, health care costs, and overall outcomes. As patients increasingly search the Internet for health information, accessibility of online material is critical. Previous studies examining this topic have focused on the readability of these materials. This study evaluates online breast reconstruction resources with regard to reading level, however, adds new metrics to assess degree of complexity, and suitability for the intended audience.

Methods: The 10 most popular patient Web sites for "breast reconstruction" were identified using the largest Internet search engine. The content of each site was assessed for readability using the simple measure of gobbledygook analysis, complexity using the PMOSE/iKIRSCH formula, and suitability using the suitability assessment of materials instrument. Resulting scores were analyzed overall and by Web site.

Results: Readability analysis revealed an overall average grade level of 13.4 (range 10.7—15.8). All sites exceeded the recommended sixth grade level. Complexity evaluation revealed a mean PMOSE/iKIRSCH score of 6.3, consistent with "low" complexity and requiring an 8th—12th grade education; individual sites ranged from "very low" to "high" complexity. Suitability assessment overall produced a mean 41.2% score, interpreted as "adequate" for the intended patient audience. Five of the 10 sites were found to be "not suitable" when examined individually; the remaining five were "adequate."

Conclusions: Available online patient material for breast reconstruction is often too difficult for many patients to understand based on readability, complexity, and suitability metrics. Comprehensive assessment is needed to design appropriate patient material and minimize disparities related to limited health literacy.

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1. Introduction

Health literacy defined by the Institute of Medicine as, "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions," is being recognized as a significant component of patient success in the modern health care system [1]. Recent national reports

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suggest, however, that approximately 46% of American adults have low or marginal health literacy [2]. Patients' ability to function successfully within the complex American health care system requires a match between their skill level and the demands of the system.

Medical care has become increasingly consumer-driven in recent decades with unprecedented direct and open consumer access to virtually unlimited online resources, and the impact of health literacy on patients' ability to access this information is critical. Health literacy has been found to be the single strongest predictor of health status and a significant contributor to health disparities: its implications for patient involvement, satisfaction, outcomes, and costs are beginning to be established in the medical literature and in government initiatives [3–8]. As such, evaluating the information patients currently use and identifying opportunities to reduce literacy-related disparities in access to information should be of great interest to health care providers.

Several evaluations of available patient resources have been published in the medical literature over the past decade, using a variety of assessment methods. A number of studies in the pharmaceutical field have used questionnaires, interviews, society, and government guidelines, and several different formulas to evaluate the readability of drug packaging inserts. Most studies identified significant barriers in the form of inadequate, overly complex, lengthy, and poorly usable information; future study and material optimization was recommended [9–12]. Other studies in otolaryngology [13], general surgery [14], orthopedics [15], urology [16], urogynecology [17], cosmetic surgery [18–20], ophthalmology [21], rheumatology [22], endocrinology [23], neurology [24], and radiation oncology [25] have evaluated the readability of both print and electronic patient resources from professional societies and Internet search results and consistently found them to be too difficult to be understood by most Americans. Although these studies are limited by text-only analysis and inability to provide concrete recommendations for improvement, their conclusion is important: further study and reform is needed across the spectrum of medical specialties.

Patients considering postmastectomy breast reconstruction have unique information needs. Choosing a type of breast reconstruction is a highly personal decision, and patients seeking breast reconstruction are typically very involved in the decision-making process, both in terms of timing and type of reconstruction. In cases where there are no surgical contraindications to a particular type of reconstruction, a patient's desires often guide the surgeon's decision-making process. Thus, a patient's understanding of the available options can have a direct effect on her outcome and satisfaction. The degree of participation in this process has been found to significantly impact patient satisfaction with the results of reconstruction [26]. Other studies have found that patients with breast cancer and those seeking reconstruction are likely to use the Internet as a first resource in gathering information to support their decision [27–29].

Health literacy does not merely focus on a patient's ability to read and comprehend material. The presentation of content, including complexity and suitability for the intended audience, is equally important. As patients are increasingly using Internet resources in making important decisions about breast reconstruction, we designed this study to evaluate the most readily available online material with metrics designed to specifically evaluate readability, complexity, and suitability. In doing so, we hope to provide a detailed, multidimensional report of the information most patients attempt to use to evaluate their options for breast reconstruction. We highlight opportunities for both revision of the material and surgeon intervention during consultation and hope this will ultimately lead to improved patient access, participation, satisfaction, and outcomes.

2. Methods

2.1. Web site and content selection

The largest Internet search engine, Google (Google, Inc, Mountain View, CA), was searched using the term, "breast reconstruction" to identify the 10 most popular Web sites for patient information. All sites were accessed on July 28, 2014. User account and location information was disabled to avoid inadvertent search bias. Sponsored results were excluded. All relevant, patient-directed information accessible within one click of the index page (as listed in the search results) was included in the content analysis. Advertisements, references, and links to outside Web sites were excluded.

2.2. Material assessment

The content of each Web site was assessed objectively for readability using the simple measure of gobbledygook (SMOG) analysis and systematically for complexity and suitability using the PMOSE/iKIRSCH and suitability assessment of materials (SAM) methods, respectively. PMOSE/iKIRSCH and SAM analyses were performed by two independent raters (C.R.V. and N.A.K.) to assess interobserver agreement. Each Web site was assessed in its native online format, and scores for each portion of the analyses were recorded individually for each site. Overall study methods are summarized in Figure 1.

SMOG analysis was performed using the Readability Studio Professional Edition v2012.1 software (Oleander Software, Ltd, Vandalia, OH). All content from each Web site was downloaded and pasted into Microsoft Word (Microsoft Corp, Redmond, WA) documents in plain text. Patient information was analyzed both overall and by Web site to identify differences
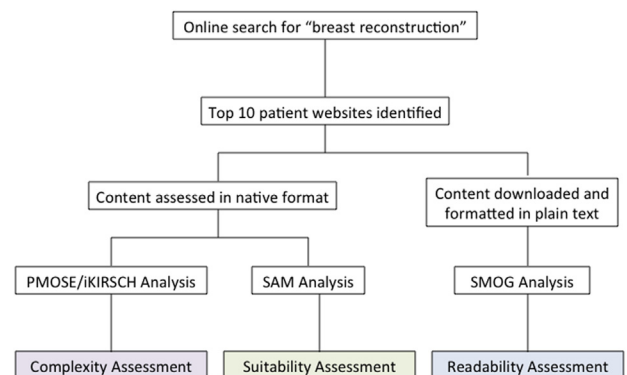

Fig. 1 – **Study methods. (Color version of figure is available online.)**