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Assessing the readability, quality, and comprehensiveness of online health resources for nonmelanoma skin cancer

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Introduction

Objectives

- Here, we aim to assess the readability, quality, and comprehensiveness of the top online health resources available to the general public pertaining to NMSC.

Background

- Nonmelanoma skin cancer (NMSC) is the most prevalent type of skin cancer, occurring in over 3 million people per year.[1]
- In the Unites States, it is estimated that 89 million people have limited health literacy, a known risk factor for poor health outcomes.[3,4]
- The American Medical Association recommends all written health materials for patients be at or below a 6th grade reading level.[3]
- Although 80% of internet users search online for health information, a quarter report difficulty understanding the information.[5,6]

Methods

- "Nonmelanoma skin cancer" was searched on Google on June 10, 2021.
- The first fifty search results were evaluated.
- Websites were excluded if they were advertisements, scientific articles, intended for healthcare professionals, or non-comprehensive.
- Readability was assessed using six metrics: Flesch Reading Ease, Flesch-Kincaid Grade Level, Gunning-Fog Index, SMOG Index, Coleman-Liau Index, and Automated Readability Index.
- Quality was assessed using JAMA Benchmark and DISCERN Instrument.
- DISCERN scores were independently assessed by two reviewers. Discrepancies within two points were averaged, and those over two points were discussed until a consensus was reached.
- Correlation between quality and readability was assessed using Pearson's Correlation.
- Comprehensiveness characteristics analyzed included: risk factors, preventative care, treatment, inclusion of multimedia, images of skin cancer, images of skin cancer in skin of color patients, availability in other languages.

Results

Overview

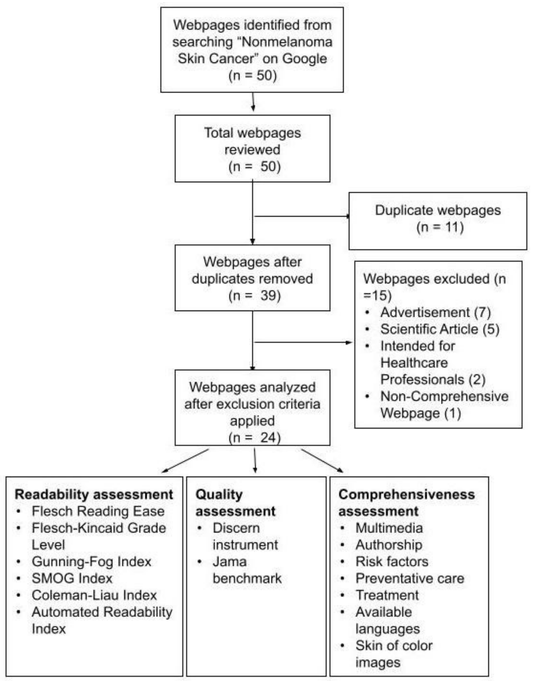

Figure 1. Prisma Diagram indicating selection and assessment of websites for the search term "nonmelanoma skin cancer"

Readability

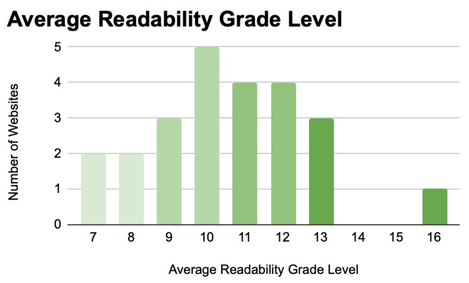

Figure 2. Graph indicating websites grouped by average readability grade level

Quality

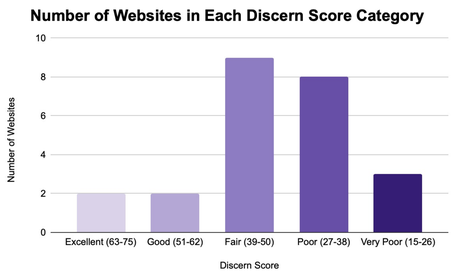

Figure 3. Graph indicating websites grouped by average DISCERN score

Website characteristics	No. (%)
Author name provided	5 (20.8%)
Author degree (n=5): MD/Other	5 (100.0%)/ 2 (40%)
Author is a dermatologist (n=5)	5 (100.0%)
Year written/modified was noted	13 (54.2%)

Table 1. Table indicating authorship and date characteristics of websites analyzed

Overall Website Quality Scores	Mean +/- SD (range)
JAMA Benchmark Criteria total score	1.58 +/- 1.18
Discern Instrument	40.8 +/- 12.8

Table 2. Table indicating JAMA Benchmark and DISCERN Instrument scores

Comprehensiveness

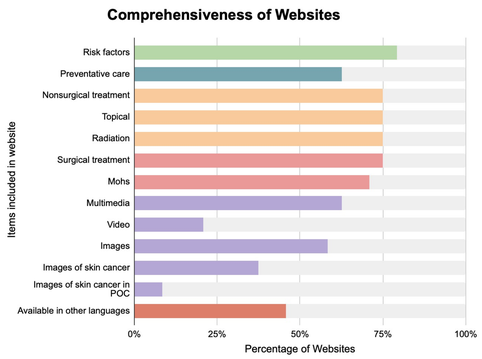

Figure 4. Graph indicating percentage of websites with each respective characteristic present

Discussion

Readability

- Readability was poor, with an average grade level of 11, far beyond the AAMC recommended level of 6th grade.
- Even the website with the lowest readability level exceeded this limit with a grade level of 7.5.

Quality

- No website met all four criteria of the JAMA Benchmark.
- The majority of websites were rated as "fair" according to the DISCERN Instrument, with 83% of websites rating as "fair," "poor," or "very poor."
- No correlation was found between readability and quality (p=0.54).

Comprehensiveness

- Many websites included multimedia, which previous studies have shown enhance comprehension of medical topics as opposed to text sources alone.[7,8]
- Although many websites included images that were examples of skin cancer, photos of people with skin of color were poorly represented. Previous studies have shown that NMSC in individuals with skin of color is often misdiagnosed or diagnosed at a later stage, as it can present differently than in individuals with light toned skin. This then leads to poorer outcomes in individuals with skin of color who have NMSC.[9,10]

Conclusion

- There is a need for better quality, readability, and comprehensiveness of online patient resources pertaining to nonmelanoma skin cancer.

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