Research Letters

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# Readability assessment of online patient education materials for central centrifugal cicatricial alopecia

**Keywords:** CCCA, education, hair loss, patient, readability

Dear Editor,

Central centrifugal cicatricial alopecia (CCCA) is a progressive form of lymphocyte-mediated scarring hair loss that predominately affects women of African descent. Early recognition and treatment are paramount to prevent further scarring and hair loss.[1] Patients often look to online resources to learn more about their health conditions.[2] Therefore, it is important that online educational materials are easily readable to patients across the health literacy spectrum. Here, we aimed to evaluate the readability of patient-facing online resources for CCCA using a common search engine.

We conducted a Google search on May 4, 2022, with the search term "central centrifugal cicatricial alopecia (CCCA) patient information." There were 555,000 results, and the top 50 results were screened for inclusion. Non-English articles, articles with a cost, articles irrelevant to CCCA, and duplicate results were excluded. Of the 50 articles, a total of 32 met the inclusion criteria. The text was input into the readabilityformulas.com calculator (https://readabilityformulas.com/free-readability-formula-tests.php). This calculator assesses readability by utilizing 7 validated readability scales: Flesch-Kincaid grade level, Gunning FOG formula, Simple Measure of Gobbledygook Index, Coleman-Liau Index, Automated Readability Index, Linsear-Write, and Flesch Reading Ease Score. The Flesch Reading Ease Score uses a scale of 0–100; a higher score indicates an easier level of readability. Differences in readability were assessed across Doctor of Medicine (MD) versus non-MD written articles using the Flesch Reading Ease Score. As a control, the same methods were used to analyze lichen planopilaris, another type of scarring alopecia.[3]

Our results demonstrate that the average reading grade level across the CCCA websites was at the 12th-grade level (12.5, range 8.5–17.2). Patient Pop and the American Academy of Dermatology websites had the lowest reading grade level (8.5 and 8.7, respectively). We found that online CCCA articles written by MD authors required a significantly higher level of education per Flesch Reading Ease Score ($n$ = 26, mean = 37.2) compared to those written by non-MD authors ($n$ = 6, mean = 50.3 and Fig. 1) ($P$ = .028, 2-tailed $t$ test). This difference was not significant for lichen planopilaris (MD: $n$ = 26, mean = 28.1; non-MD: $n$ = 2, mean = 42) ($P$ = .210, 2-tailed $t$ test). Limitations of this study include a small sample size and inclusion of only English-written articles.

Online resources for CCCA were written at a minimum of 5 grade levels higher than the American Medical Association's recommended 6th-grade reading level, regardless of the readability scale used (Fig. 2).[4] Furthermore, MD authors wrote articles at a significantly higher reading level than non-MD authors. National data indicate that limited health literacy contributes to poor health outcomes and compromises patient safety.[4] Improving readability (eg, using simpler terms, shorter sentences, and visual aids) can increase patients' confidence and allow them to make well-informed decisions about their health. We encourage authors of CCCA online educational materials, especially medical providers, to publish content that follows national recommendations for readability. This ensures that patients are well-informed and are better able to engage in shared decision-making with their dermatologists.

## Conflicts of interest

None.

## Funding

None.

## Study approval

N/A.

## Author contributions

OE: Participated in research design, writing the article, performance of the research, and data analysis. DO: Participated in writing the article and data analysis. JBB-K: Participated in writing the article. JN: Participated in writing the article.

**What is known about this subject in regard to women and their families?**

- Central centrifugal cicatricial alopecia (CCCA) is a progressive form of scarring alopecia that primarily affects women of African descent.

**What is new from this article as messages for women and their families?**

- Our article shows that most online information about CCCA is written at a minimum of 5 grade levels higher than the American Medical Association's recommended 6th-grade reading level.
- This study highlights the need for high-quality, readable, and engaging online CCCA information to improve patients understanding of this condition and allow them to better engage in shared decision-making.



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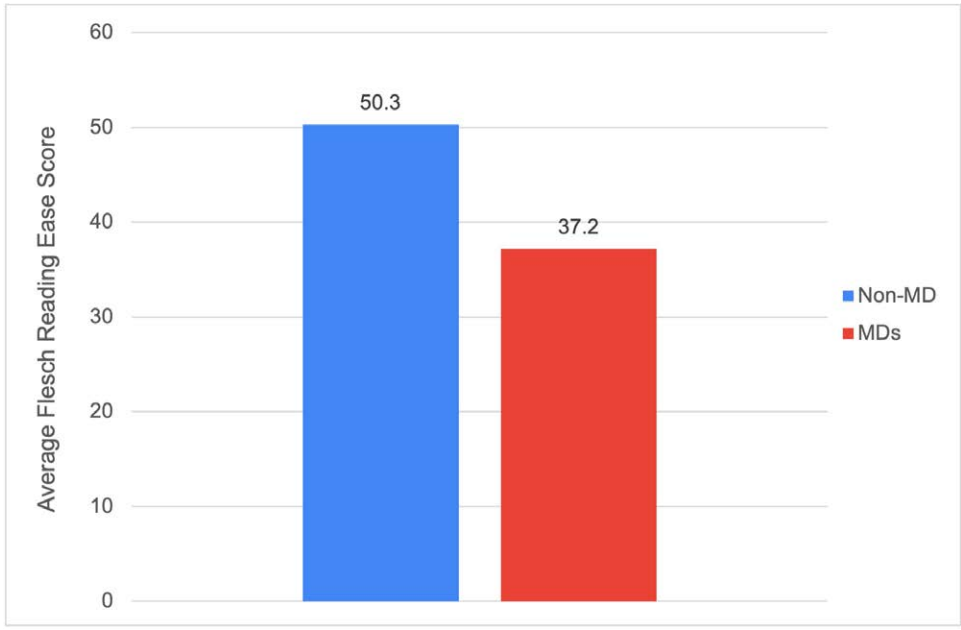


**Fig. 1.** Average Flesch Reading Ease Score compared between MDs versus non-MDs. MD authors had a lower Flesch Reading Ease score (n = 26, mean = 37.2) compared to those written by non-MD authors (n = 6, mean = 50.3) (*P* = .028, 2-tailed *t* test). MD, Doctor of Medicine.

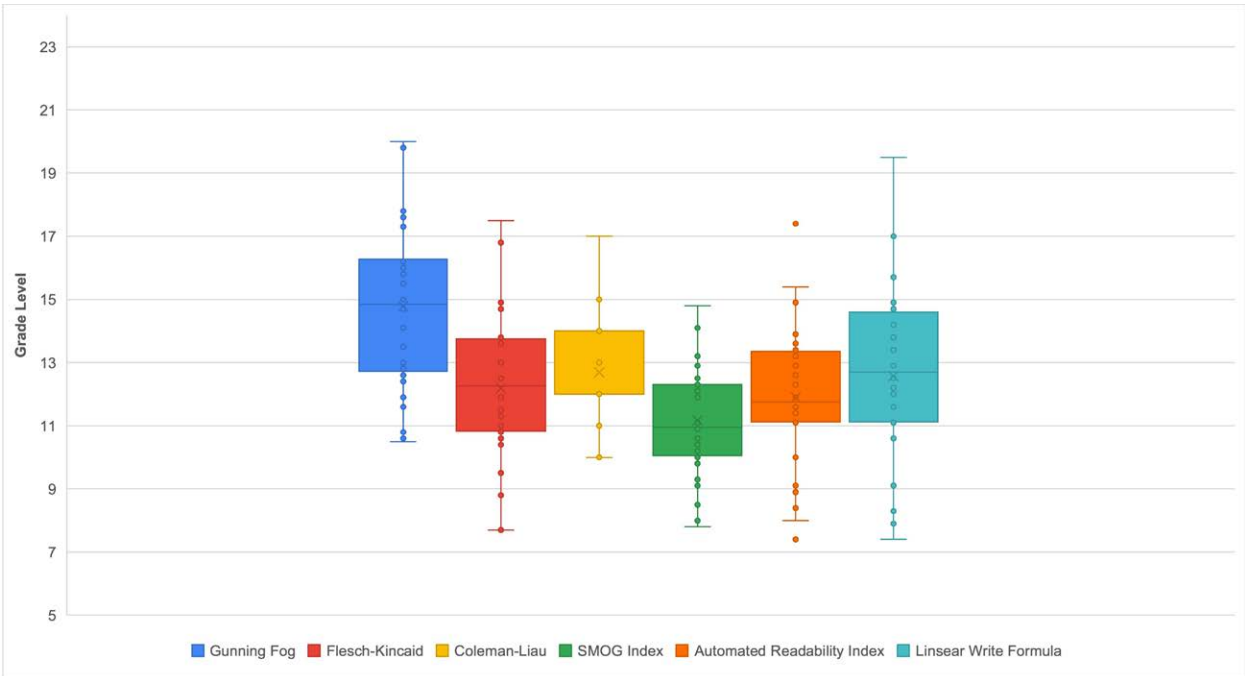


**Fig. 2.** Readability of 32 websites were assessed using the Gunning Fog Index (mean = 14.8), Flesch-Kincaid Grade Level (mean = 12.2), Coleman-Liau Index (mean = 12.7), Simple Measure of Gobbledygook Index (mean = 11.2), Automated Readability Index (mean = 12.0), and Linsear-Write (mean = 12.6). Whiskers show the minimum and maximum for each readability scale.

SCT: Participated in research design, writing the article, and performance of the research.

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