

# Characterizing the readability of patient educational materials for melasma during pregnancy

**Keywords:** chloasma, hyperpigmentation, literacy, melasma, pregnancy, readability

## To the editor:

Melasma, a common pigmentary disorder characterized by brown-gray patches on the face, often occurs during pregnancy. While melasma, linea nigra, and postinflammatory hyperpigmentation do not pose any risk to the physical health of the pregnant patient, their negative impact on quality of life and psychological distress has been well characterized.<sup>1</sup> Treatment options for melasma during pregnancy are constrained by the risk of further hyperpigmentation and teratogenicity.<sup>2</sup>

With limited access to dermatologists and gynecologists and the difficult nature of treating melasma, pregnant patients may face challenges in obtaining appointments,<sup>3</sup> leading them to seek information online to understand their condition and manage their melasma. Online materials can help to assuage pregnant patients' concerns and distress with melasma in an effective manner. This study aims to evaluate the readability and quality of online resources currently available for melasma in pregnancy.

We searched for the term "melasma in pregnancy," assessing the first 100 results in English on Google on March 1, 2023. Research articles and multimedia were excluded to mimic patient preferences. We used objective readability metrics to analyze the selected online resources: Flesch-Kincaid grade level, Gunning Fog index, Coleman-Liau index, SMOG index, and the Linsear Write formula; higher scores indicate a higher number of years of formal education required to understand an article. In addition, the modified DISCERN questionnaire was used to measure resources' reliability with a maximum score of 5.

Eighty-one online Web pages and articles were selected and evaluated. The median grade level required to understand these resources was 10th grade or higher for all readability metrics. The mean grade level ranged from 10.23 to 13.38, indicating a significant educational background needed (Fig. 1). The highest grade level required by an article was 19.3. Clinician-reviewed articles did not show a statistically significant difference in readability compared to non-clinician-reviewed articles, though the clinician-reviewed articles had the lower mean and median grade level in every category. Only 35/81 articles were clinician-reviewed. In addition, the mean modified DISCERN score was 3.12; clinician-reviewed articles had a significantly

higher reliability rating (3.65) than non-clinician-reviewed articles (2.70),  $P < .01$ .

Our findings reveal that the readability of online resources for melasma in pregnancy does not align with the Agency for Healthcare Research and Quality's recommendation for patient educational materials to be written at or below a 6th-grade reading level, indicating potential health literacy barriers.<sup>4</sup> Pregnant patients are particularly vulnerable to online misinformation, given the potential teratogenic risk of mainstays of melasma treatment like Retin-A, hydroquinone, or chemical peels. In addition, research has shown that non-native English speakers are less likely to know their own dermatologic diagnosis.<sup>5</sup> For individuals with low educational attainment or those who speak English as a second language, the lack of readability of online resources for melasma may hinder their ability to make informed decisions about treating melasma. Clinician-reviewed materials provide somewhat increased reliability and readability. Since melasma of pregnancy can cause significant distress and embarrassment to patients, it is imperative that online materials are readable and reliable for patients.

## Conflicts of interest

None.

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

- Melasma disproportionately affects women during and after pregnancy, and careful management of this condition with regard to hormones and sun sensitivity is important.
- There is little research evaluating the quality and accessibility of online resources for patients seeking information about melasma during pregnancy.

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

- The median amount of educational attainment required to read and understand online articles about melasma in pregnancy is above 10th grade.
- Clinician involvement in reviewing online articles did not result in significantly higher readability ratings.
- Online resources about melasma in pregnancy should be written with their readers in mind, as many treatment options for melasma in nonpregnant patients would not be suitable for pregnant patients.

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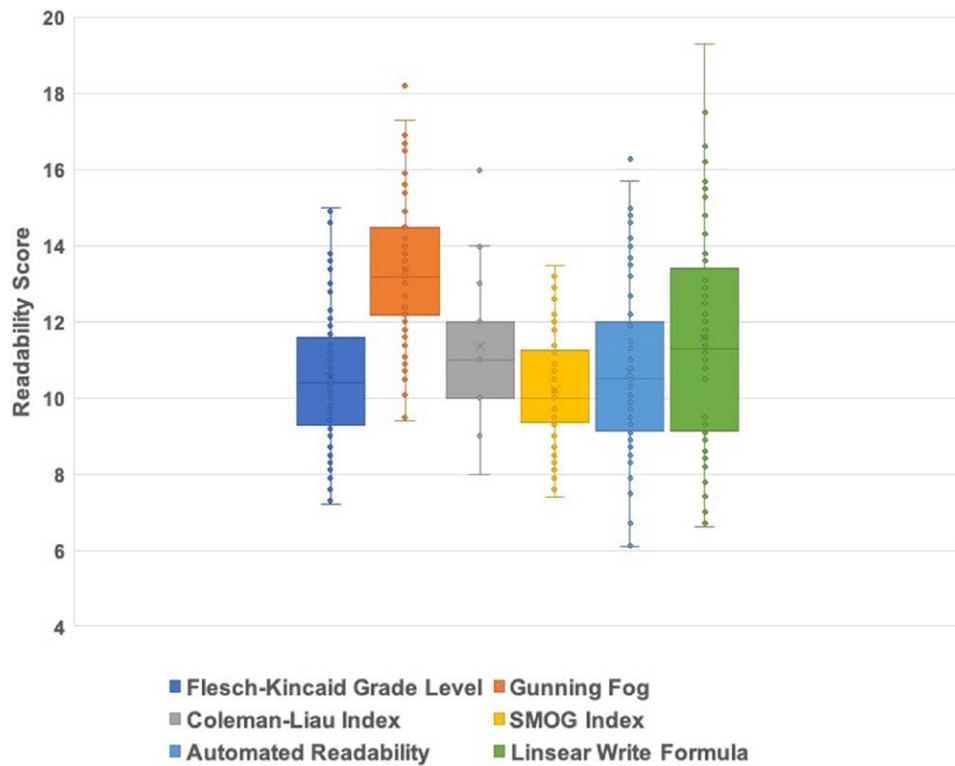


Fig. 1. Box and whisker plot of readability scores for online articles on melasma in pregnancy by different readability metrics.

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**Study approval**

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