

# Analysis of Skin Color on the American Academy of Dermatology Public Education Website

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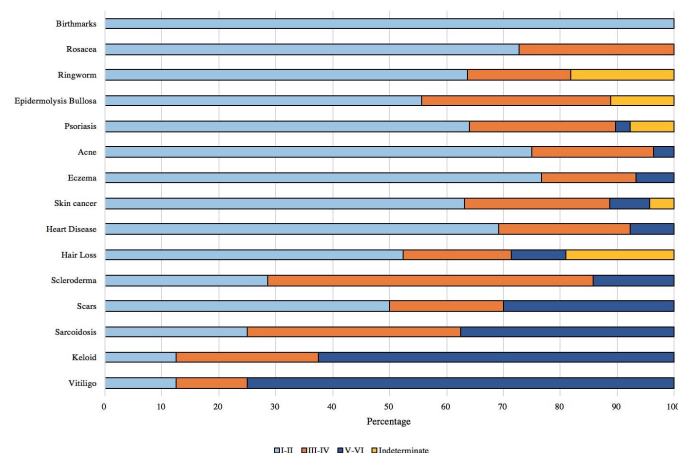
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Access to health information online has resulted in increased internet use to find medical education resources.<sup>1,2</sup> The United States (US) population is comprised of 60.1% Whites, 18.5% Hispanics or Latinos, 13.4% Blacks or African Americans, with trends toward increasing diversity. Our objectives were to analyze skin color distributions on the American Academy of Dermatology (AAD) public education website.

A cross-sectional study of "Diseases & Conditions" on the AAD public education website was conducted to identify skin colors, June 30 – July 2, 2020. Both authors categorized images by Fitzpatrick skin type. Images were labeled as indeterminate due to lighting, image framing, or disease extent. The analysis included those conditions with greater than seven images to ensure more representative sets.

On average, skin types I/II represented 55%, III/IV 24%, and V/VI 17% of images, with 4% indeterminate. Types V/VI were highly represented in vitiligo and keloid sections. Sarcoidosis and scar pages had roughly equal representations of all skin types (Figure 1). For stock images, 351/490 (72%) depicted Fitzpatrick I/II, 51/490 (10%) III/IV, 43/490 (9%) V/VI skin types, with 7/490 (1%) indeterminate, and 38/490 (8%) mixed. Mixed images depicted a group with various skin colors.

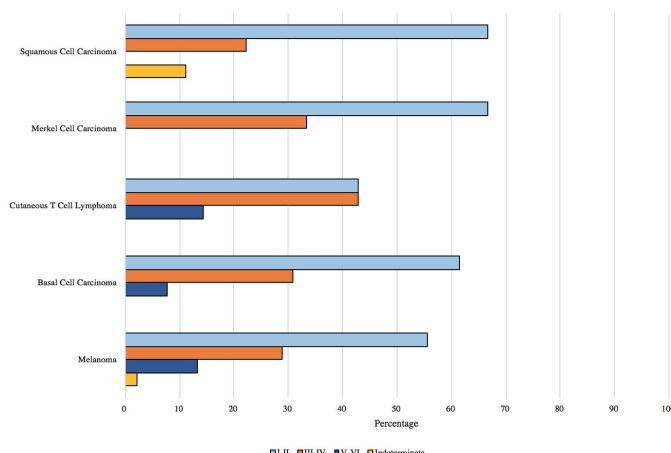
**FIGURE 1.** Distribution of skin colors on the AAD public education website.



The AAD public education website represents diverse arrays of skin colors. Conditions with fewer Fitzpatrick III–VI images were supplemented with text about skin color. Examples are "People with skin of color can get rosacea"; "10 tips for clearing acne in skin of color"; "How can an African American woman treat scalp psoriasis?"; "Can signs of psoriasis vary with skin tone?"; "Can you get psoriasis if you have skin of color?"; and ringworm presentations in skin of color.

Skin cancer images in darker skin types are sparse (Figure 2); these deficits are partially compensated by supplementary text. In the "Skin cancer in people of color" section, it is emphasized that skin cancer diagnosis in people of color is often detected in late stages, with recommendations for improved identification. In the cutaneous T-cell lymphoma section, increasing prevalence in African Americans and presentation of "light spots" in skin of color is cited. Eight commonly used dermatology textbooks and web-based resources also reported scarce skin cancer dark skin images (V/VI). These sources, on average, had lower proportions of dark skin images for melanoma (2.9%) and basal cell carcinoma (2.4%) compared to the AAD public education website.<sup>3</sup> Diagnostic accuracy of skin neoplasms using google reverse images was significantly lower in skin of color (IV–VI).<sup>4</sup> The 5-year survival of patients with malignant melanoma

**FIGURE 2.** Distribution of skin colors in skin cancer images on the AAD public education website.



was 91.1% for Whites and 67.3% for Blacks.<sup>5</sup> Therefore, more educational resources are needed for skin cancer detection in people of color.

The study is limited by the subjectivity in assigning Fitzpatrick skin types. Lighting variations also contributed to difficulties in assigning colors.

The AAD public education website portrays diverse arrays of skin colors. We recommend increased emphasis on increasing the number of darker skin color images for the birthmark, rosacea, ringworm, blistering disorders, and skin cancer sections. It is essential that patient education mirrors US diversity and avoids unintended biases.

## DISCLOSURES

Michelle Chang and Dr. Lipner have no conflicts of interest relevant to the content.

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