

Racial Limitations of Fitzpatrick Skin Type

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PRACTICE POINTS

- Medical providers should be cognizant of conflating race and ethnicity with Fitzpatrick skin type (FST).
- Misuse of FST may occur more frequently among physicians who do not identify as having skin of color.
- Although alternative skin type classification systems have been proposed, more clinically relevant methods for describing skin of color need to be developed.

Fitzpatrick skin type (FST) was developed to assess the propensity of the skin to burn during phototherapy, but it also is commonly used by providers as means of describing constitutive skin color and ethnicity. We conducted an anonymous survey of dermatologists and dermatology trainees to evaluate how providers use FST in their clinical practice. Although providers should be cognizant of conflating race/ethnicity with FST, the original intent of FST also should be emphasized in medical school and resident education.

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Fitzpatrick skin type (FST) is the most commonly used classification system in dermatologic practice. It was developed by Thomas B. Fitzpatrick, MD, PhD, in 1975 to assess the propensity of the skin to burn during phototherapy.¹ Fitzpatrick skin type also can be used to assess the clinical benefits and efficacy of cosmetic procedures, including laser hair removal, chemical peel and dermabrasion, tattoo removal, spray tanning, and laser resurfacing for acne scarring.² The original FST classifications included skin types I through IV; skin types V

and VI were later added to include individuals of Asian, Indian, and African origin.¹ As a result, FST often is used by providers as a means of describing constitutive skin color and ethnicity.³

How did FST transition from describing the propensity of the skin to burn from UV light exposure to categorizing skin color, thereby becoming a proxy for race? It most likely occurred because there has not been another widely adopted classification system for describing skin color that can be applied to all skin types. Even when the FST classification scale is used as intended, there are inconsistencies with its accuracy; for example, self-reported FSTs have correlated poorly with sunburn risk as well as physician-reported FSTs.^{4,5} Although physician-reported FSTs have been demonstrated to correlate with race, race does not consistently correlate with objective measures of pigmentation or self-reported FSTs.⁵ For example, Japanese women often self-identify as FST type II, but Asian skin generally is considered to be nonwhite.¹ Fitzpatrick himself acknowledged that *race* and *ethnicity* are cultural and political terms with no scientific basis.⁶ Fitzpatrick skin type also has been demonstrated to correlate poorly with constitutive skin color and minimal erythema dose values.⁷

We conducted an anonymous survey of dermatologists and dermatology trainees to evaluate how providers use FST in their clinical practice as well as how it is used to describe race and ethnicity.

Methods

The survey was distributed electronically to dermatologists and dermatology trainees from March 13 to March 28, 2019, using the Association of Professors of Dermatology listserv, as well as in person at the annual

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Skin of Color Society meeting in Washington, DC, on February 28, 2019. The 8-item survey included questions about physician demographics (ie, primary practice setting, board certification, and geographic location); whether the respondent identified as an individual with skin of color; and how the respondent utilized FST in clinical notes (ie, describing race/ethnicity, skin cancer risk, and constitutive [baseline] skin color; determining initial phototherapy dosage and suitability for laser treatments, and likelihood of skin burning). A *t* test was used to determine whether dermatologists who identified as having skin of color utilized FST differently.

Results

A total of 141 surveys were returned, and 140 respondents were included in the final analysis. Given the methods used to distribute the survey, a response rate could not be calculated. The respondents included more board-certified dermatologists (70%) than dermatology trainees (30%). Ninety-three percent of respondents indicated an

academic institution as their primary practice location. Notably, 26% of respondents self-identified as having skin of color.

Forty-one percent of all respondents agreed that FST should be included in their clinical documentation. In response to the question “In what scenarios would you refer to FST in a clinical note?” 31% said they used FST to describe patients’ race or ethnicity, 47% used it to describe patients’ constitutive skin color, and 22% utilized it in both scenarios. Respondents who did not identify as having skin of color were more likely to use FST to describe constitutive skin color, though this finding was not statistically significant ($P=.063$). Anecdotally, providers also included FST in clinical notes on post-inflammatory hyperpigmentation, melasma, and treatment with cryotherapy.

Comment

The US Census Bureau has estimated that half of the US population will be of non-European descent by 2050.⁸



Artist Angélica Dass rethinks the concept of race by showing the diversity of human skin colors in her global photographic mosaic. © Angélica Dass | Humanae Work in Progress (Courtesy of the artist).

As racial and ethnic distinctions continue to be blurred, attempts to include all nonwhite skin types under the umbrella term *skin of color* becomes increasingly problematic. The true number of skin colors is unknown but likely is infinite, as Brazilian artist Angélica Dass has demonstrated with her photographic project “Humanae” (Figure). Given this shift in demographics and the limitations of the FST, alternative methods of describing skin color must be developed.

The results of our survey suggest that approximately one-third to half of academic dermatologists/dermatology trainees use FST to describe race/ethnicity and/or constitutive skin color. This misuse of FST may occur more frequently among physicians who do not identify as having skin of color. Additionally, misuse of FST in academic settings may be problematic and confusing for medical students who may learn to use this common dermatologic tool outside of its original intent.

Classification Systems for Assessment of Skin Type

Classification System	Method of Classification	Measurement and Utilization in Practice
Baumann skin type ⁹	Self-reported ^a	Classify skin type according to 4 different components: dry or oily, sensitive or resistant, pigmented or nonpigmented, and prone or tight
Fanous classification ¹⁰	Self-reported ^b	Based on race and genetic origin of the patient (6 categories: Nordics, Europeans, Mediterraneans, Indo-Pakistanis, Africans, and Asians); used for laser resurfacing, chemical peels, and dermabrasion
Fitzpatrick skin type ^{1,2}	Visual, self-reported ^a	6-point subjective classification system developed to assess the propensity of the skin to burn during phototherapy
Glogau wrinkle scale ¹¹	Visual	Photographs used to assess photoaging (rhytides and discoloration) in white individuals
Goldman World Classification of Skin Types ¹²	Visual, self-reported ^b	Skin color, response to burning or tanning, and PIH based on race/ethnicity
Kawada Skin Classification System for Japanese Individuals ¹³	Self-reported	Used to describe Japanese skin types and their sensitivity to UV light, sunburn, and tanning
Lancer Ethnicity Scale ¹⁴	Self-reported ^b	Accounts for 5 different skin types based on geography and heredity; can be used in conjunction with FST to assess for risk factors prior to treatments such as cosmetic laser surgery or chemical peels
Modified Fitzpatrick skin type ¹⁵	Self-reported ^a	Modified to assess phototype, skin color, and the ability to burn or tan in Indian individuals
Roberts Skin Type Classification System ¹⁶	Visual, self-reported ^b	4 elements (phototype, hyperpigmentation, photoaging, and scarring) are evaluated to identify a patient's skin type and provide data to predict the skin's likely response to insult, injury, and inflammation
Taylor Hyperpigmentation Scale ¹⁷	Visual	15 uniquely colored plastic cards spanning the full range of skin hues; each card contains 10 bands of increasingly darker gradations that represent progressive levels of hyperpigmentation
von Luschan chromatic scale ¹⁸	Visual	36 opaque glass tiles compared to the patient's skin to establish race classifications by skin color
Willis and Earles scale ¹⁹	Self-reported ^b	Used in people of African descent to classify skin color, UV light reaction, and associated pigmentary disorders

Abbreviation: PIH, postinflammatory hyperpigmentation.

^aQuestionnaire, may or may not be modified.

^bDetailed family history (ancestry).

We acknowledge that the conundrum of how to classify individuals with nonwhite skin or skin of color is not simply answered. Several alternative skin classification models have been proposed to improve the sensitivity and specificity of identifying patients with skin of color (Table). Refining FST classification is one approach. Employing terms such as *skin irritation*, *tenderness*, *itching*, or *skin becoming darker* from sun exposure rather than *painful burn* or *tanning* may result in better identification.¹⁴ A study conducted in India modified the FST questionnaire to acknowledge cultural behaviors.¹⁵ Because lighter skin is culturally valued in this population, patient experience with purposeful sun exposure was limited; thus, the questionnaire was modified to remove questions on the use of tanning booths and/or creams as well as sun exposure and instead included more objective questions regarding dark brown eye color, black and dark brown hair color, and dark brown skin color.¹⁵ Other studies have suggested that patient-reported photosensitivity assessed via a questionnaire is a valid measure for assessing FST but is associated with an overestimation of skin color, known as “the dark shift.”²⁰

Sharma et al¹⁵ utilized reflectance spectrophotometry as an objective measure of melanin and skin erythema. The melanin index consistently showed a positive correlation with FSTs as opposed to the erythema index, which correlated poorly.¹⁵ Although reflectance spectrometry accurately identifies skin color in patients with nonwhite skin,^{21,22} it is an impractical and cost-prohibitive tool for daily practice. A more practical tool for the clinical setting would be a visual color scale with skin hues spanning FST types I to VI, including bands of increasingly darker gradations that would be particularly useful in assessing skin of color. Once such tool is the Taylor Hyperpigmentation Scale.¹⁷ Although currently not widely available, this tool could be further refined with additional skin hues.

Conclusion

Other investigators have criticized the various limitations of FST, including physician vs patient assessment, interview vs questionnaire, and phrasing of questions on skin type.²³ Our findings suggest that medical providers should be cognizant of conflating race and ethnicity with FST. Two authors of this report (O.R.W. and J.E.D.) are medical students with skin of color and frequently have observed the addition of FST to the medical records of patients who were not receiving phototherapy as a proxy for race. We believe that more culturally appropriate and clinically relevant methods for describing skin of color need to be developed and, in the interim, the original intent of FST should be emphasized and incorporated in medical school and resident education.

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REFERENCES

1. Goldsmith LA, Katz SI, Gilchrist BA, et al, eds. *Fitzpatrick's Dermatology in General Medicine*. 8th ed. New York, NY: The McGraw-Hill Companies; 2012.
2. Sachdeva S. Fitzpatrick skin typing: applications in dermatology. *Indian J Dermatol Venereol Leprol*. 2009;75:93-96.
3. Everett JS, Budescu M, Sommers MS. Making sense of skin color in clinical care. *Clin Nurs Res*. 2012;21:495-516.
4. Eilers S, Bach DQ, Gaber R, et al. Accuracy of self-report in assessing Fitzpatrick skin phototypes I through VI. *JAMA Dermatol*. 2013; 149:1289-1294.
5. He SY, McCulloch CE, Boscardin WJ, et al. Self-reported pigmentary phenotypes and race are significant but incomplete predictors of Fitzpatrick skin phototype in an ethnically diverse population. *J Am Acad Dermatol*. 2014;71:731-737.
6. Fitzpatrick TB. The validity and practicality of sun-reactive skin types I through VI. *Arch Dermatol*. 1988;124:869-871.
7. Leenutaphong V. Relationship between skin color and cutaneous response to ultraviolet radiation in Thai. *Photodermatol Photoimmunol Photomed*. 1996;11:198-203.
8. Colby SL, Ortman JM. *Projections of the Size and Composition of the US Population: 2014 to 2060*. Washington, DC: US Census Bureau; 2015.
9. Baumann L. Understanding and treating various skin types: the Baumann Skin Type Indicator. *Dermatol Clin*. 2008;26:359-373.
10. Fanous N. A new patient classification for laser resurfacing and peels: predicting responses, risks, and results. *Aesthetic Plast Surg*. 2002;26:99-104.
11. Glogau RG. Chemical peeling and aging skin. *J Geriatric Dermatol*. 1994;2:30-35.
12. Goldman M. Universal classification of skin type. In: Shiffman M, Mirrafati S, Lam S, et al, eds. *Simplified Facial Rejuvenation*. Berlin, Heidelberg, Germany: Springer; 2008:47-50.
13. Kawada A. UVB-induced erythema, delayed tanning, and UVA-induced immediate tanning in Japanese skin. *Photodermatol*. 1986;3:327-333.
14. Lancer HA. Lancer Ethnicity Scale (LES). *Lasers Surg Med*. 1998;22:9.
15. Sharma VK, Gupta V, Jangid BL, et al. Modification of the Fitzpatrick system of skin phototype classification for the Indian population, and its correlation with narrowband diffuse reflectance spectrophotometry. *Clin Exp Dermatol*. 2018;43:274-280.
16. Roberts WE. The Roberts Skin Type Classification System. *J Drugs Dermatol*. 2008;7:452-456.
17. Taylor SC, Arsonnaud S, Czernielewski J. The Taylor hyperpigmentation scale: a new visual assessment tool for the evaluation of skin color and pigmentation. *Cutis*. 2005;76:270-274.
18. Treesirichod A, Chansakulporn S, Wattanapan P. Correlation between skin color evaluation by skin color scale chart and narrowband reflectance spectrophotometer. *Indian J Dermatol*. 2014;59:339-342.
19. Willis J, Earles RM. A new classification system relevant to people of African descent. *J Cosmet Dermatol*. 2005;18:209-216.
20. Reeder AI, Hammond VA, Gray AR. Questionnaire items to assess skin color and erythema sensitivity: reliability, validity, and “the dark shift.” *Cancer Epidemiol Biomarkers Prev*. 2010;19:1167-1173.
21. Dwyer T, Muller HK, Blizzard L, et al. The use of spectrophotometry to estimate melanin density in Caucasians. *Cancer Epidemiol Biomarkers Prev*. 1998;7:203-206.
22. Pershing LK, Tirumala VP, Nelson JL, et al. Reflectance spectrophotometer: the dermatologists' sphygmomanometer for skin phototyping? *J Invest Dermatol*. 2008;128:1633-1640.
23. Trakatelli M, Bylaite-Bucinskiene M, Correia O, et al. Clinical assessment of skin phototypes: watch your words! *Eur J Dermatol*. 2017;27:615-619.