

Skin of Color Representation on Wikipedia

Sky Ridge Transitional Year Program

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Background

- Wikipedia is one of the most popular websites and may be a go-to source of health and dermatology education for the general population¹.
- Prior research indicates poor skin of color (SOC) photo representation in printed dermatology textbooks and online medical websites^{7,8}.
- There has been no assessment performed to determine whether this discrepancy also exists for Wikipedia.

Objective

The aim of this study was to investigate the number and quality of SOC photos included in Wikipedia's skin disease pages and to explore the possible ramifications of these findings.

Methods

- Photos of skin diseases from Wikipedia's "List of Skin Conditions" were assigned by three independent raters as SOC (Fitzpatrick skin types 4-6) or non-SOC (Fitzpatrick skin types 1-3) and were given a quality rating (1-3) based on sharpness, size/resolution, and lighting/exposure.
- Quality and quantity of images were compared between SOC and non-SOC using a t-test.

Results

- 421 skin disease Wikipedia pages and 949 images met inclusion criteria.
- 20.7% SOC skin disease images (196/949 images).
- 79.3% non-SOC skin disease images (753/949 images) (P<0.001). (Figure 1)
- Skin photo number and percentage by Wikipedia skin categories. (Table 1)
- No significant difference in the average quality of SOC (2.05) and non-SOC (2.03) images (P=0.81). (Figure 2)

Figure 1. Skin photo number and percentage (P<0.001).

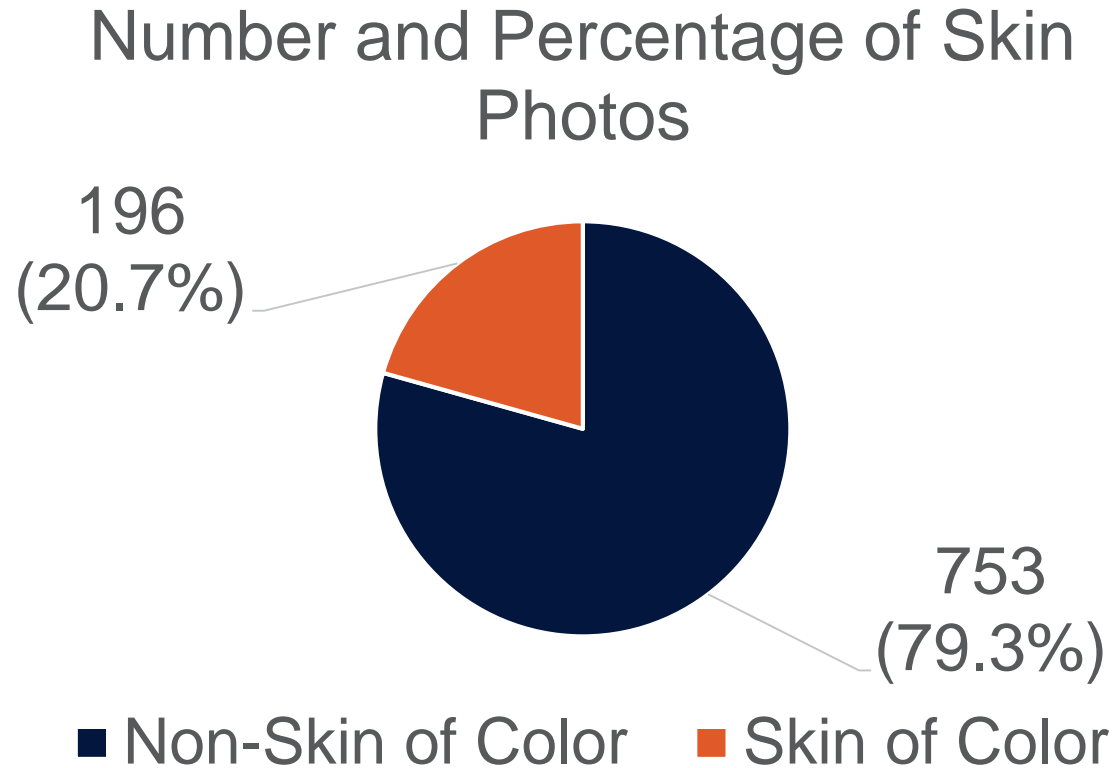


Table 1. Number and percentage of non-SOC to SOC skin photos on Wikipedia’s List of Skin Conditions (abbreviated) continued.

Skin conditions	Non-SOC photos		SOC photos		Total photos (n)
	n	%	n	%	
Acneiform eruptions	13	81%	3	19%	16
Chronic blistering	11	92%	1	8%	12
Conditions of the mucous membranes	30	91%	3	9%	33
Conditions of the skin appendages	43	78%	12	22%	55

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Table 1. Number and percentage of non-SOC to SOC skin photos on Wikipedia’s List of Skin Conditions (abbreviated) continued.

Skin conditions	Non-SOC photos		SOC photos		Total photos (n)
	n	%	n	%	
Congenital anomalies	9	82%	2	9%	11
Connective tissue diseases	48	92%	4	8%	52
Dermal and subdermal growths	45	66%	23	34%	68
Dermatitis	32	84%	6	16%	38
Disturbances of pigmentation	12	71%	5	29%	17

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Table 1. Number and percentage of non-SOC to SOC skin photos on Wikipedia’s List of Skin Conditions (abbreviated) continued.

Skin conditions	Non-SOC photos		SOC photos		Total photos (n)
	n	%	n	%	
Drug eruptions	11	79%	3	21%	14
Epidermal nevi, neoplasms, and cysts	45	88%	6	12%	51
Erythemas	11	92%	1	8%	12
Genodermatoses	31	74%	11	26%	42
Infection-related	146	67%	71	33%	217
Lymphoid-related	11	92%	1	8%	12

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Table 1. Number and percentage of non-SOC to SOC skin photos on Wikipedia’s List of Skin Conditions (abbreviated) continued.

Skin conditions	Non-SOC photos		SOC photos		Total photos (n)
	n	%	n	%	
Melanocytic nevi and neoplasms	36	92%	3	8%	39
Neurocutaneous	11	79%	3	21%	14
Papulosquamous hyperkeratotic	12	100%	0	0%	12
Pruritic	8	67%	4	33%	12
Psoriasis	15	100%	0	0%	15

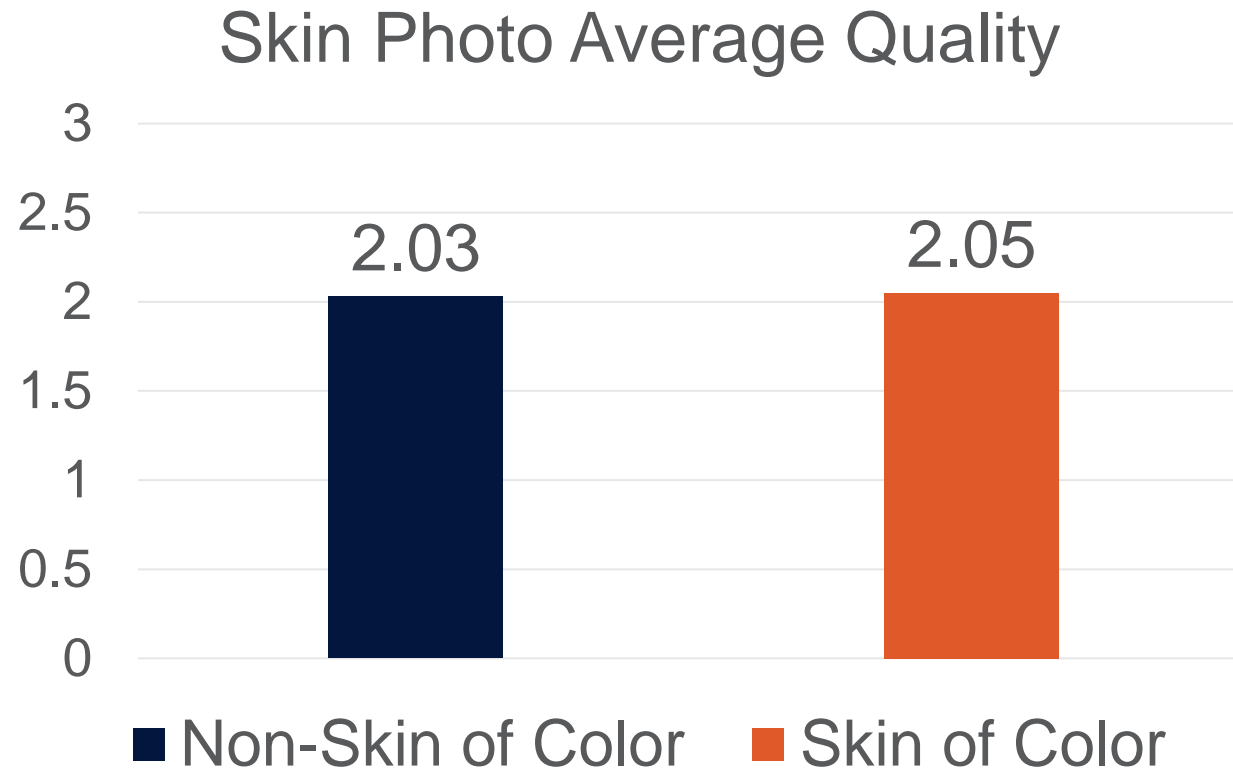
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Table 1. Number and percentage of non-SOC to SOC skin photos on Wikipedia’s List of Skin Conditions (abbreviated) continued.

Skin conditions	Non-SOC photos		SOC photos		Total photos (n)
	n	%	n	%	
Resulting from errors in metabolism	10	100%	0	0%	10
Resulting from physical factors	65	88%	9	12%	74
Vascular-related	45	90%	5	10%	50

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Figure 2. Skin photo average quality (P=0.81).



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Discussion

- DermNet NZ - 2.8% dark skin images (Fitzpatrick types 5,6)⁷.
- VisualDx - 28.5% dark skin images (Fitzpatrick types 5,6)⁷.
- Wikipedia - 20.7% SOC images (Fitzpatrick types 4-6).
- US internet traffic and engagement rankings: VisualDx (113,182), Dermnet (26,412) and Wikipedia (8)¹.

Discussion - continued

Wikipedia is arguably one of the main sources of dermatology information for the general public, and the discrepancies in SOC representation have a larger influence on the public's perception of dermatologic disease and care compared to other dermatology resources.

Discussion - continued

Possible ramifications of inadequate Wikipedia
SOC photo representation:

- Decreased access to accurate information for patients with SOC.
- Skewed societal perceptions of dermatologic disease presentations for patients with SOC.

Study Limitations

Study limitations include the subjective nature of the Fitzpatrick skin typing system and a narrow photo quality criteria.

Conclusions

- There is SOC underrepresentation in the gross number of SOC images for dermatologic conditions on Wikipedia.
- Specific dermatology-related Wikipedia pages that need updating with more SOC photographs include hyperpigmentation, acral lentiginous melanoma, melasma, pityriasis alba, acne, and atopic dermatitis.
- Improving SOC photo representation on Wikipedia may ameliorate general public access to accurate dermatology information and improve health equity.

Conflicts of Interest

Dr. Robert P. Dellavalle is the Editor in Chief for JMIR Dermatology and receives editorial stipends from JMIR Dermatology.

References

1. Alexa. URL: <https://www.alexa.com/siteinfo> [accessed 2021-05-31]
2. Hutton MO, Dawson JE, Lee KC, Shumaker PR, Doney E, Dellavalle RP. Improving Wikipedia skin disease content. *J Am Acad Dermatol* 2019 Nov;81(5):1193-1195.
3. Cochrane Skin Wikipedia Initiative. Cochrane Skin. URL: <https://skin.cochrane.org/our-evidence/cochrane-skin-wikipedia-initiative> [accessed 2021-05-17]
4. Jothishankar B, Stein SL. Impact of skin color and ethnicity. *Clin Dermatol* 2019;37(5):418-429.
5. Bologna JL, Jorizzo JJ, Schaffer JV, Callen JP, Cerroni L, Heymann WR, et al. *Dermatology*, 3rd edition. London: Elsevier; 2012.
6. List of skin conditions. Wikipedia. URL: https://en.wikipedia.org/wiki/List_of_skin_conditions [accessed 2021-05-14]
7. Alvarado SM, Feng H. Representation of dark skin images of common dermatologic conditions in educational resources: A cross-sectional analysis. *J Am Acad Dermatol* 2021 May;84(5):1427-1431.
8. Jones VA, Clark KA, Shobajo MT, Cordova A, Tsoukas MM. Skin of color representation in medical education: an analysis of popular preparatory materials used for United States medical licensing examinations. *J Am Acad Dermatol* 2020 Aug 01:online ahead of print.
9. Ware OR, Dawson JE, Shinohara MM, Taylor SC. Racial limitations of fitzpatrick skin type. *Cutis* 2020 Feb;105(2):77-80.
10. Davis SA, Narahari S, Feldman SR, Huang W, Pichardo-Geisinger RO, McMichael AJ. Top dermatologic conditions in patients of color: an analysis of nationally representative data. *J Drugs Dermatol* 2012 Apr;11(4):466-473.
11. Kim Y, Blomberg M, Rifas-Shiman SL, Camargo CA, Gold DR, Thyssen JP, et al. Racial/ethnic differences in incidence and persistence of childhood atopic dermatitis. *J Invest Dermatol* 2019 Apr;139(4):827-834
12. McGinty S, Siddiqui WJ. Keloid. *StatPearls*. 2020 Aug 16. URL: <https://www.ncbi.nlm.nih.gov/books/NBK507899/> [accessed 2021-06-26]

Thank you for your time and attention!