Accuracy and Sources of Images From Direct Google Image Searches for Common Dermatology Terms

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PRACTICE POINTS

- Direct Google image searches largely deliver accurate results for common dermatological diagnoses.
- Greater effort should be made to include more publicly available images for dermatological diseases in darker skin types.

To the Editor:

Prior studies have assessed the quality of text-based dermatology information on the Internet using traditional search engine queries.[1] However, little is understood about the sources, accuracy, and quality of online dermatology images derived from direct image searches. Previous work has shown that direct search engine image queries were largely accurate for 3 pediatric dermatology diagnosis searches: atopic dermatitis, lichen striatus, and subcutaneous fat necrosis.[2] We assessed images obtained for common dermatologic conditions from a Google image search (GIS) compared to a traditional text-based Google web search (GWS).

Image results for 32 unique dermatologic search terms were analyzed (Table 1). These search terms were selected using the results of a prior study that identified the most common dermatologic diagnoses that led users to the 2 most popular dermatology-specific websites worldwide: the American Academy of Dermatology (www.aad.org) and DermNet New Zealand (www.dermnetnz.org).[3] The Alexa directory (www.alexa.com), a large publicly available Internet analytics resource, was used to determine the most common dermatology search terms that led a user to either www.dermnetnz.org or www.aad.org. In addition, searches for the 3 most common types of skin cancer—melanoma, squamous cell carcinoma, and basal cell carcinoma—were included. Each term was entered into a GIS and a GWS. The first 10 results, which represent 92% of the websites ultimately visited by users,[4] were analyzed. The source, diagnostic accuracy, and Fitzpatrick skin type of the images was determined. Website sources were organized into 11 categories. All data collection occurred within a 1-week period in August 2015.

A total of 320 images were analyzed. In the GIS, private websites (36%), dermatology association websites (28%), and general health information websites (10%) were the 3 most common sources. In the GWS, health information websites (35%), private websites (21%), and dermatology association websites (20%) accounted for the most common

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Table 1.
Disease-Specific Dermatologic Search Terms[a]

Alopecia areata	Melasma
Basal cell carcinoma	Nummular eczema
Closed comedones	Pityriasis alba
Fordyce spots	Pityriasis rosea
Granuloma annulare	Pityriasis versicolor
Grover's disease	Poikiloderma of Civatte
Hemangioma	Poison ivy rash
Herpes simplex virus	Pompholyx
Hypertrichosis	Pyoderma gangrenosum
Idiopathic guttate hypomelanosis	Scabies
Keratosis pilaris	Scalp folliculitis
Lentigo simplex	Solar lentigines
Lichen planopilaris	Squamous cell carcinoma
Lichen planus	Staphylococcal scalded skin syndrome
Livedo reticularis	Subungual melanoma
Melanoma	Warts

[a]The search terms analyzed in this study were determined from the Alexa database (www.alexa.com), an Internet analytics resource. The list in this table includes all unique diagnoses of the top 25 search terms of the 2 most popular dermatology-specific websites— www.dermnetnz.org and www.aad.org—along with the 3 most common skin cancer diagnoses. Twenty-one terms overlapped between the 2 websites, yielding 29 unique terms.

sources (Table 2). The majority of images were of Fitzpatrick skin types I and II (89%) and nearly all images were diagnostically accurate (98%). There was no statistically significant difference in accuracy of diagnosis between physician-associated websites (100% accuracy) versus nonphysician-associated sites (98% accuracy, $P=.25$).

Our results showed high diagnostic accuracy among the top GIS results for common dermatology search terms. Diagnostic accuracy did not vary between websites that were physician associated versus those that were not. Our results are comparable to the reported accuracy of online dermatologic health information.[1] In GIS results, the majority of images were provided by private websites, whereas the top websites in GWS results were health information websites.

Only 1% of images were of Fitzpatrick skin types VI and VII. Presentation of skin diseases is remarkably different based on the patient's skin type.[5] The shortage of readily accessible images of skin of color is in line with the lack of familiarity physicians and trainees have with dermatologic conditions in ethnic skin.[6]

Based on the results from this analysis, providers and patients searching for dermatologic conditions via a direct GIS should be cognizant of several considerations. Although our results showed that GIS was accurate, the searcher should note that image-based searches are not accompanied by relevant text that can help confirm relevancy and accuracy. Image searches depend on textual tags added by the source website. Websites that represent dermatological associations and academic centers can add an additional layer of confidence for users. Patients and clinicians also should be aware that the consideration of a patient's Fitzpatrick skin type is critical when assessing the relevancy of a GIS result. In

Table 2.

Classification of Sources for Top 10 GIS and GWS Results (N=320)

Website Category[a]	Search Results		
	GIS, n (%)	GWS, n (%)	*P* Value
Private website[b]	114 (36)	66 (21)	<.05
Dermatology association website[b]	89 (28)	63 (20)	<.05
Health information website (general)[b]	33 (10)	112 (35)	<.05
Private practice website[b]	28 (9)	6 (2)	<.05
Social media website[b]	16 (5)	6 (2)	<.05
Health information website (dermatology)[b]	13 (4)	4 (1)	<.05
Medical journal[b]	7 (2)	18 (6)	<.05
Academic institution[b]	6 (2)	22 (7)	<.05
Patient association website	6 (2)	14 (4)	.1
Dermatology retail website	3 (1)	3 (1)	1.0
Medical association	3 (1)	3 (1)	1.0
Media website	2 (1)	3 (1)	1.0

Abbreviations: GIS, Google image search; GWS, Google web search.
[a]The category of websites was determined for a direct GIS versus a traditional text-based GWS.
[b]All significance levels were calculated using the Fisher exact test at a significance level of $\alpha = .05$.

conclusion, search results via GIS queries are accurate for the dermatological diagnoses tested but may be lacking in skin of color variations, suggesting a potential unmet need based on our growing ethnic skin population.

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