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RESEARCH LETTER

WILEY

Assessment of patient perceptions of artificial intelligence use in dermatology: A cross-sectional survey

Dear Editor,

The use of artificial intelligence (AI) in medicine has grown in recent decades, with deep neural networks demonstrating accuracies comparable to dermatologists when classifying melanoma, keratinocyte carcinomas, and other common skin conditions.[1–3] With the future possibility that AI will be integrated into dermatology practice, it is important to understand how patients view these possible changes. Although prior studies have shown that patients are open to the use of AI in the diagnosis of skin cancer, little is known about patients' trust and perception of AI accuracy in general dermatology.[4,5] This survey study aimed to gather opinions from a diverse dermatology patient population on AI use in dermatology and establish a specific accuracy at which patients would be comfortable receiving a diagnosis solely from an AI tool.

We created a 20-question survey utilizing a five-point Likert scale to assess patient opinions on AI in dermatology. Patients were given a specific example of AI use in dermatology in which a program would analyze a patient-acquired photograph of a skin lesion or rash and provide a list of potential diagnoses to the patient based on the photograph. Patients were then asked to complete a survey on their opinion of this type of AI (Attachment 1). The survey was given randomly via convenience sampling to adult patients who visited the University of Texas Southwestern Medical Center Dermatology Clinic between June 2023 and September 2023. Standard deviation, frequency distribution, and multivariable logistic regression were used in statistical analysis. The UT Southwestern Institutional Review Board approved this study.

Among 157 patients informed about the study, 141 (89.8%) consented to complete the survey. Seventy-three respondents (51.8%) were male, 79 respondents (56.0%) were non-Hispanic white, and the mean (SD) age was 55.3 (16.5) years (Table 1). Respondents had a household income of $50,000–$99,999 (55 [39.0%]) and 61 (43.2%) respondents attained a bachelor's degree). Most respondents did not work in healthcare (125 [88.7%]), and 33 (23.4%) respondents obtained a degree in or held a job in computer science.

The majority of respondents believed a dermatologist's diagnosis was accurate (131 [92.9%]), whereas only a minority believed a diagnosis made by AI to be accurate (52 [36.9%]) (Table 2). If differing diagnoses were received from a dermatologist and an AI model, most respondents would trust a dermatologist over an AI model

TABLE 1 Characteristics of survey respondents.

Respondent characteristics	
Characteristic	**No. (%)**
Total No.	141
Age, Mean (SD), y	55.3 (16.5)
Sex	
Women	68 (48.2)
Men	73 (51.8)
Race/Ethnicity	
White, Non-Hispanic	79 (56.0)
Black, Non-Hispanic	22 (15.6)
Hispanic	21 (14.9)
Asian	15 (10.6)
Other	2 (1.4)
Decline to report	3 (2.1)
Household income, $	
0–49,999	11 (7.8)
50,000–99,999	55 (39.0)
100,000–149,999	37 (26.2)
150,000 or higher	23 (16.3)
Decline to report	15 (10.6)
Education level	
Less than high school	1 (0.7)
High school graduate	23 (16.3)
Associate degree	32 (22.7)
Bachelors degree	61 (43.2)
Masters or doctoral degree	23 (16.3)
Decline to report	1 (0.7)
Healthcare worker	
Yes	16 (11.3)
No	125 (88.7)
Computer science degree	
Yes	33 (23.4)
No	108 (76.6)

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TABLE 2 Respondent perceptions of artificial intelligence use in dermatology.

Mean Likert score and frequency of negative, neutral, and positive responses by survey questions				
	Mean Likert score (SD)	No. (%) Strongly disagree or somewhat disagree	No. (%) Neither disagree or agree	No. (%) Somewhat agree or strongly agree
I am familiar with how AI can be used in dermatology.	2.4 (1.2)	76 (53.9)	31 (22.0)	32 (22.7)
I have a positive outlook on the increasing use of AI in dermatology.	3.5 (1.2)	29 (20.6)	39 (27.7)	73 (51.8)
I believe that a diagnosis made by a dermatologist is accurate.	4.6 (0.6)	1 (0.7)	9 (6.4)	131 (92.9)
I believe that a diagnosis made by an AI is accurate.	3.1 (1.0)	33 (23.4)	56 (39.7)	52 (36.9)
If a dermatologist and an AI gave me different diagnoses, I would trust the dermatologist over the AI.	4.3 (0.9)	6 (4.3)	16 (11.3)	119 (84.4)
If a dermatologist and AI were equally accurate, I would prefer to get a diagnosis from a dermatologist rather than an AI.	4.4 (0.9)	8 (5.7)	14 (9.9)	119 (84.4)
AI can help improve the accuracy of dermatologists.	3.9 (1.1)	13 (9.2)	40 (28.4)	88 (62.4)
I would prefer to get a diagnosis by a dermatologist working with an AI rather than just a dermatologist.	4.0 (1.1)	14 (9.9)	31 (22.0)	96 (68.1)

TABLE 3 Respondent answers to questions comparing accuracy requirements of artificial intelligence to dermatologists.

	Mean percent (SD)	Difference (SD)	Number of respondents who answered N/A (%)
Assuming that dermatologists have a diagnostic accuracy of 70%, please answer the following question: On a scale from 0 to 100%, how accurate would an AI need to be in order for you to be comfortable with only seeing an AI and not a dermatologist for a diagnosis?	86.8% (10.1)	16.8 (10.1)	21 (14.9)
Assuming that dermatologists have a diagnostic accuracy of 80%, please answer the following question: On a scale from 0 to 100%, how accurate would an AI need to be in order for you to be comfortable with only seeing an AI and not a dermatologist for a diagnosis?	93.2% (6.9)	13.2 (6.9)	21 (14.9)
Assuming that dermatologists have a diagnostic accuracy of 90%, please answer the following question: On a scale from 0 to 100%, how accurate would an AI need to be in order for you to be comfortable with only seeing an AI and not a dermatologist for a diagnosis?	98.8% (4.2)	8.8 (4.2)	25 (17.7)

(119 [84.4%]). Even with equal diagnostic accuracy, most respondents preferred to see a dermatologist over an AI model alone (119 [84.4%]). Respondents required the AI model to be 12.9% (SD, ± 8.1%) more accurate on average than a dermatologist in order for respondents to be comfortable only receiving evaluation from an AI model and not a dermatologist (Table 3). Some respondents were completely unwilling to be evaluated by an AI model alone (21 [14.9%]). Nonetheless, a majority of respondents believed that a model that could provide diagnoses based on a photograph could help improve the accuracy of dermatologists (88 [62.4%]), and most would rather get a diagnosis from a dermatologist working with an AI model than solely a dermatologist (96 [68.1%]). After performing a multivariable logistic regression controlling for sociodemographic factors, age 40–59 was significantly associated with a decrease in familiarity with AI (odds ratio: 0.21, $p < 0.01$) (Table S1). Being familiar with AI was significantly associated with a positive view of AI (odds ratio: 17.8, $p < 0.01$), belief that AI can improve the accuracy of dermatologists (odds ratio: 4.73, $p = 0.04$), and preference to receive a diagnosis from a dermatologist working with an AI over a dermatologist alone (odds ratio: 39.58, $p < 0.01$). Interestingly, having a computer science degree or working in computer science was not significantly associated with a more positive of AI.

Our results suggest that although patients have a slightly positive view of AI, many still lack a clear understanding of how AI works. Additionally, patients require a higher diagnostic accuracy of an AI model than that of a dermatologist in order to be willing to be evaluated by the model alone. Studies have shown that the accuracy of AI models for multiclass skin disease detection range from 57% to 75%.[3,6] Given that dermatologists have a diagnostic accuracy ranging from 75% to 85%,[7,8] the estimated threshold in our study for standalone AI use still remains to be met. Our study also demonstrates a clear patient preference for

AI use in tandem with a dermatologist rather than as an independent tool. Familiarity with AI was associated with a more positive perception of AI and an increased belief that AI can help dermatologists, suggesting that improving familiarity with AI through patient education may improve patients' attitudes towards AI use in dermatology.

Limitations of our study include the use of a nonvalidated survey, single-institution nature, highly educated patient population, and focus on a single use of AI as a tool to evaluate patient-acquired photographs and provide diagnoses. Further research should be aimed at validating patients' accuracy requirements for AI implementation in various settings.

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None

CONFLICT OF INTEREST STATEMENT

The author declares no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

IRB APPROVAL STATUS

Approved.

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