

Measuring Empathy in Artificial Intelligence: Insights From Psychodermatology and Implications for General Practice

To the Editor: Delusional parasitosis (DP), also known as Ekbom syndrome, is a psychocutaneous disorder wherein patients have a fixed, false, unwavering belief that they are infected with parasites.¹ This disorder often presents with extensive pruritus as well as hesitancy to obtain psychiatric treatment.¹ Because of a lack of insight, many patients may continue to suffer.

Studies have demonstrated that artificial intelligence (AI), particularly specific chatbots programmed for cognitive-behavioral therapy, may serve as cost-effective and accessible psychiatric therapeutic options.² With the rise of AI models such as ChatGPT-4, the potential of AI in psychodermatology remains unexplored.

Methods

The goal of this study was to assess which AI modality has the

most potential to help a patient with DP based on the Empathy Scale for Human-Computer Communication (ESHCC) score.³ The ESHCC is an analytical framework created to measure perceived empathy in large language models.³ Each item on the ESHCC is scored using a 7-point Likert-type scale (1 = not at all to 7 = extensively).³ In Table 1, comparisons of responses between ChatGPT-4, Google, Claude, and Bard are shown.

Table 1.

Comparison of Responses and Empathy Scale for Human-Computer Communication (ESHCC) Scores

Example of prompt	ChatGPT-4 response snippet	Google response snippet	Claude response snippet	Bard/Gemini response snippet
"Please Help. I feel like bugs are crawling on me."	I'm really sorry to hear that you're feeling this way, but I can't provide medical or psychological assistance.	Link to Cleveland Clinic's explanation of tactile hallucinations: Formication is a symptom where you hallucinate the feeling of insects crawling in, on, or underneath your skin.	I understand this must be very distressing but try to remain calm. Let me know if you need any other coping suggestions or want to talk more about what you're experiencing.	It sounds like you're experiencing a sensation called formication, which is the feeling of insects crawling on or under your skin even though there aren't any there. This can be a very distressing and uncomfortable feeling, and I understand that you're seeking help.
Will people think I am crazy if I really have Ekbom syndrome?	It's understandable to have concerns about how others might perceive you if you have Ekbom syndrome, but it's essential to recognize that mental health conditions, including Ekbom syndrome, do not make you "crazy." It's a medical condition that can affect anyone, and it does not define your overall mental health or character. Remember that seeking help for Ekbom syndrome is a courageous step towards managing your well-being and improving your quality of life.	Link to Quora post entitled, "Have you ever experienced delusional parasitosis?"	No, you should not feel that you are "crazy" if you are experiencing Ekbom syndrome, also known as delusional parasitosis. There are support groups for those with Ekbom where you can share coping strategies. You are not alone. With treatment, many people with Ekbom recover fully or manage the symptoms successfully. This is not a permanent state. Try not to worry about judgment from others. Focus on finding a knowledgeable doctor who takes your concerns seriously.	The stigma surrounding mental health conditions, including Ekbom syndrome (also known as delusional parasitosis), is a real concern. However, it's important to remember that having this condition doesn't make you "crazy" in any way. It's a genuine medical condition with identifiable causes and effective treatment options. By seeking professional help, focusing on your recovery, and advocating for yourself, you can effectively manage Ekbom syndrome and live a fulfilling life.
ESHCC mean score	ChatGPT-4 45.5	Google 38.75	Claude 64.25	Bard/Gemini 55.5
Comparison of results	Scheffé T statistic ^a	Scheffé P value ^a	Scheffé inference ^a	
ChatGPT-4 vs Google	9.0895	1.1520 × 10 ⁻⁵	^b P < .01	
ChatGPT-4 vs Claude	10.1749	3.5154 × 10 ⁻⁶	^b P < .01	
ChatGPT-4 vs Bard/Gemini	5.4266	0.0014972	^b P < .01	
Google vs Claude	19.2644	2.7318 × 10 ⁻⁹	^b P < .01	
Google vs Bard/Gemini	14.5161	7.0072 × 10 ⁻⁸	^b P < .01	
Claude vs Bard/Gemini	4.7483	0.0043153	^b P < .01	

^aThe Scheffé method is an analysis method used to control the type 1 error rate when multiple comparisons are being made. It is used after an analysis of variance test has found significant differences among group means to determine which specific groups differ from each other.

^bP < .01 is considered statistically significant.

Results

Statistically significant differences between all groups were observed. Claude had the highest score on the ESHCC, while Google search results had the lowest. For one of the prompts, Google had a link to a Cleveland Clinic website, stating that persistent itching may be a sign of an underlying neurological disorder such as Parkinson disease or multiple sclerosis. In contrast, the AI chatbots provided more direct, reassuring answers such as “No, you are not crazy” and “I understand this is very distressing.” For a concerned patient, learning that their symptoms may be a sign of a much more serious neurological condition may be more stress-inducing. While preliminary, our results suggest that AI chatbots may provide more supportive answers than Google, reflected by higher ESHCC scores.

Discussion

Physicians may use the results of this study in their interactions with patients with DP. As in all patient-provider relationships, but particularly in conditions where patient insight is lacking, validating the patient’s experience with empathetic

answers while providing accurate information is crucial. For example, physicians may use the ESHCC to grade their responses to patients, such as in the setting of responding to a patient question on an online health portal. Furthermore, studies have demonstrated that AI chatbots generate quality and empathetic responses to patient questions asked in an online forum. Taking advantage of such technology has the potential to prevent provider burnout and even improve patient outcomes.⁴ For instance, machine learning algorithms have already demonstrated excellent performance in objective, accurate measurements of itch by quantifying scratching behavior.⁵ Further directions may involve AI chatbots being used as distractions to pruritic behavior, resources for patient education, or starting points for seeking support. Limitations of this study include a limited number of prompts and differing responses to the same prompts by AI chatbots. Additionally, it is important to consider that empathy may vary among individuals and thus ESHCC scores may be user dependent.³

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Kripa Ahuja, MS
Peter Lio, MD

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Author Affiliations: Eastern Virginia Medical School, Norfolk, Virginia (Ahuja); Northwestern University, Department of Dermatology, Chicago, Illinois (Lio).

Corresponding Author: Kripa Ahuja, MS, Eastern Virginia Medical School, 825 Fairfax Ave, Norfolk, VA 23507 (ahujak@evms.edu).

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