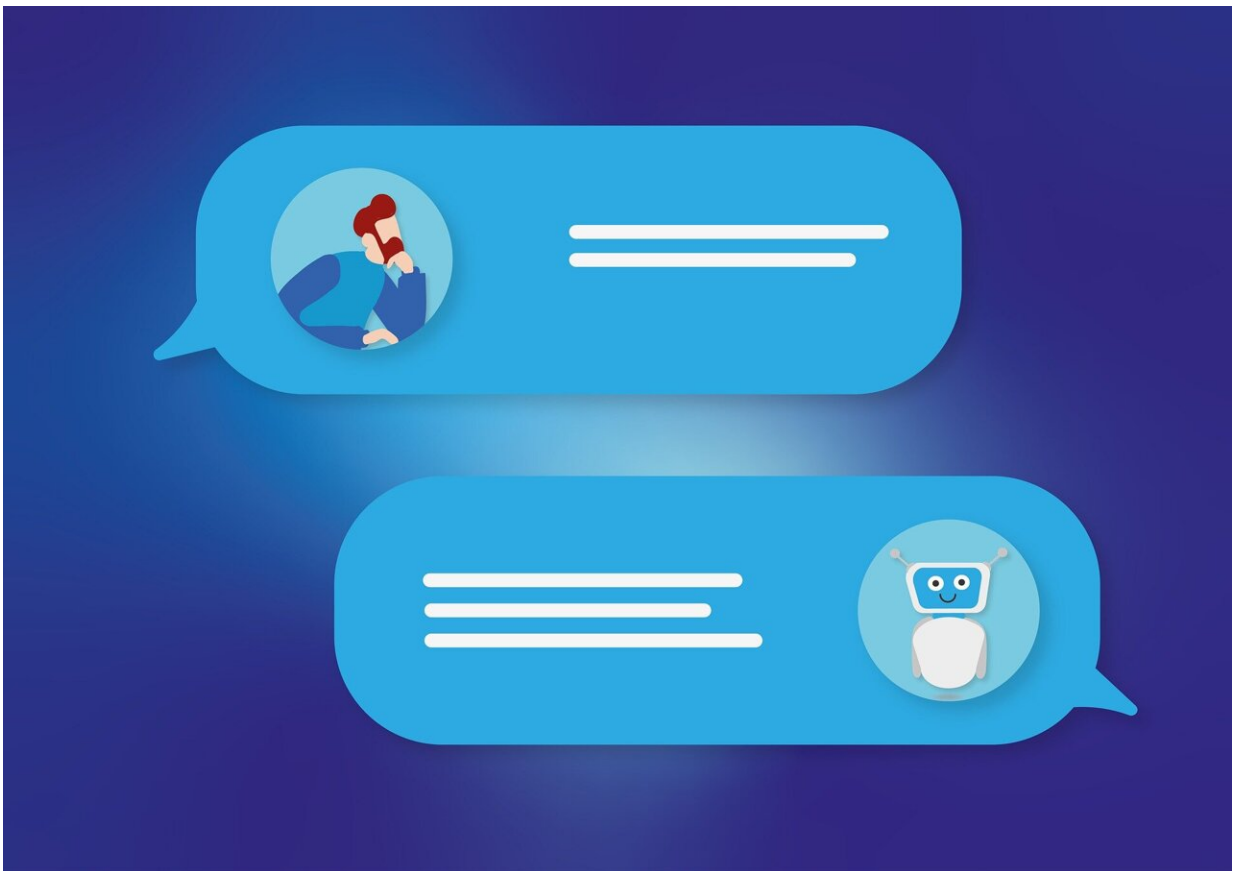# Do chatbot avatars prompt bias in health care?

June 6 2023, by Kara Mason

Credit: Pixabay/CC0 Public Domain

Chatbots are increasingly becoming a part of health care around the world, but do they encourage bias? That's what University of Colorado

School of Medicine researchers are asking as they dig into patients' experiences with the artificial intelligence (AI) programs that simulate conversation.

"Sometimes overlooked is what a chatbot looks like—its avatar," the researchers write in a new paper published in *Annals of Internal Medicine*. "Current chatbot avatars vary from faceless health system logos to cartoon characters or human-like caricatures. Chatbots could one day be digitized versions of a patient's physician, with that physician's likeness and voice. Far from an innocuous design decision, chatbot avatars raise novel ethical questions about nudging and bias."

The paper, titled "More than just a pretty face? Nudging and bias in chatbots", challenges researchers and health care professionals to closely examine chatbots through a health equity lens and investigate whether the technology truly improves patient outcomes.

In 2021, the Greenwall Foundation granted CU Division of General Internal Medicine Associate Professor Matthew DeCamp, MD, Ph.D., and his team of researchers in the CU School of Medicine funds to investigate ethical questions surrounding chatbots. The research team also included Internal medicine professor Annie Moore, MD, MBA, the Joyce and Dick Brown Endowed Professor in Compassion in the Patient Experience, incoming medical student Marlee Akerson, and UCHealth Experience and Innovation Manager Matt Andazola.

"If chatbots are patients' so-called 'first touch' with the health care system, we really need to understand how they experience them and what the effects could be on trust and compassion," Moore says.

So far, the team has surveyed more than 300 people and interviewed 30 others about their interactions with health care-related chatbots. For Akerson, who led the survey efforts, it's been her first experience with

bioethics research.

"I am thrilled that I had the chance to work at the Center for Bioethics and Humanities, and even more thrilled that I can continue this while a [medical student](#) here at CU," she says.

The face of health care

The researchers observed that chatbots were becoming especially common around the COVID-19 pandemic.

"Many [health systems](#) created chatbots as symptom-checkers," DeCamp explains. "You can go online and type in symptoms such as cough and fever and it would tell you what to do. As a result, we became interested in the ethics around the broader use of this technology."

Oftentimes, DeCamp says, chatbot avatars are thought of as a marketing tool, but their appearance can have a much deeper meaning.

"One of the things we noticed early on was this question of how people perceive the race or ethnicity of the chatbot and what effect that might have on their experience," he says. "It could be that you share more with the chatbot if you perceive the chatbot to be the same race as you."

For DeCamp and the team of researchers, it prompted many [ethical questions,](#) like how health care systems should be designing chatbots and whether a design decision could unintentionally manipulate patients.

There does seem to be evidence that people may share more information with chatbots than they do with humans, and that's where the ethics tension comes in: We can manipulate avatars to make the chatbot more effective, but should we? Does it cross a line around overly influencing a person's health decisions?" DeCamp says.

A chatbot's avatar might also reinforce social stereotypes. Chatbots that exhibit feminine features, for example, may reinforce biases on women's roles in health care.

On the other hand, an avatar may also increase trust among some patient groups, especially those that have been historically underserved and underrepresented in health care, if those patients are able to choose the avatar they interact with.

"That's more demonstrative of respect," DeCamp explains. "And that's good because it creates more trust and more engagement. That person now feels like the health system cared more about them."

Marketing or nudging?

While there's little evidence currently, there is a hypothesis emerging that a chatbot's perceived race or ethnicity can impact patient disclosure, experience, and willingness to follow health care recommendations.

"This is not surprising," the CU researchers write in the *Annals* paper. "Decades of research highlight how patient-physician concordance according to gender, race, or ethnicity in traditional, face-to-face care supports health care quality, patient trust, and satisfaction. Patient-chatbot concordance may be next."

That's enough reason to scrutinize the avatars as "nudges," they say. Nudges are typically defined as low-cost changes in a design that influence behavior without limiting choice. Just as a cafeteria putting fruit near the entrance might "nudge" patrons to pick up a healthier option first, a [chatbot](link) could have a similar effect.

"A patient's choice can't actually be restricted," DeCamp emphasizes. "And the information presented must be accurate. It wouldn't be a nudge

if you presented misleading information."

In that way, the avatar can make a difference in the health care setting, even if the nudges aren't harmful.

DeCamp and his team urge the medical community to use chatbots to promote health equity and recognize the implications they may have so that the artificial intelligence tools can best serve patients.

"Addressing biases in chatbots will do more than help their performance," the researchers write. "If and when chatbots become a first touch for many patients' health care, intentional design can promote greater trust in clinicians and health systems broadly."

More information: Marlee Akerson et al, More Than Just a Pretty Face? Nudging and Bias in Chatbots, *Annals of Internal Medicine* (2023). [DOI: 10.7326/M23-0877](https://doi.org/10.7326/M23-0877)

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