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ChatGPT Virtual Assistant for Breast Reconstruction: Assessing Preferences for a Traditional Chatbot versus a Human AI VideoBot

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Background: Recent advancements in artificial intelligence (AI) have reshaped telehealth, with AI chatbots like Chat Generative Pretrained Transformer (ChatGPT) showing promise in various medical applications. ChatGPT is capable of offering basic patient education on procedures in plastic and reconstructive surgery (PRS), yet the preference between human AI VideoBots and traditional chatbots in plastic and reconstructive surgery remains unexplored.

Methods: We developed a VideoBot by integrating ChatGPT with Synthesia, a human AI avatar video platform. The VideoBot was then integrated into Tolstoy to create an interactive experience that answered four of the most asked questions related to breast reconstruction. We used Zapier to develop a ChatGPT-integrated chatbot. A 16-item survey adapted from the 2005 validated measurement of online trust by Corritore et al was distributed online to female participants via Amazon Mechanical Turk.

Results: A total of 396 responses were gathered. Participants were 18 to 64 years old. Perceptions of truthfulness, believability, content expertise, ease of use, and safety were similar between the VideoBot and chatbot. Most participants preferred the VideoBot compared with the traditional chatbot (63.5% versus 28.1%), as they found it more captivating than the text-based chatbot. Of the participants, 77% would have preferred to see someone who they identified with in terms of gender and race.

Conclusions: Both the VideoBot and text-based chatbot show comparable effectiveness, usability, and trust. Nonetheless, the VideoBot's human-like qualities enhance interactivity. Future research should explore the impact of race and gender concordance in telehealth to provide a more personalized experience for patients.
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INTRODUCTION

Telemedicine is defined as the use of electronic information and communications technologies to provide and support health care when distance separates the participants.[1] Research has shown that implementing telemedicine can improve access to the specialty of plastic and reconstructive surgery (PRS) by facilitating the provision of expertise at remote sites.[2] Research has also identified that telemedicine in PRS increased opportunities for postoperative monitoring and reduced the number of unnecessary clinic visits, increasing the overall cost savings for providers and patients.[3] The use of this technology within the PRS landscape decreased response times for referrals and improved triage decision-making.[3] These platforms have also introduced novel avenues for surgical education and increased access to specialist care in rural and low-resource settings.[3]

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Within the realm of telemedicine, chatbots, a colloquial term for conversational agents, are computer programs that are capable of simulating human conversation.[4,5] In health care, artificial intelligence (AI) conversational agents have been studied in a variety of applications such as addressing mental health, providing clinical decision or triage support, providing treatment recommendations, supporting health care training, and providing medical education to laypeople.[6] Chatbots provide a conversational, personal, and comprehendible avenue for learning about health care information.[7] Although chatbots function similarly to a search engine, research has found that implementing more human-like qualities has the potential to increase user effectiveness, usability, and trust. Text-based systems do not utilize a personal approach to patient interaction, leaving room for improvement in personalizing the telemedicine experience.[8]

In November 2022, an AI chatbot using natural language processing capable of generating human-like conversations, called ChatGPT, was publicly introduced.[9,10] In PRS, ChatGPT has been perceived to be capable of providing general information in a coherent and accessible format on topics, including rhinoplasty and breast augmentation.[11,12] These research authors suggested that ChatGPT could serve as a valuable resource to supplement, but not replace, engagement with physicians who can offer more specific and personalized information.[11,12] To improve the adoption of AI chatbots in health care, efforts can be made towards enhancing their empathy and personification, allowing individualized interactions with each patient.[13] Toward this goal, we created a chatbot using a virtual human AI avatar with ChatGPT integration (VideoBot) capable of answering four of the most frequently asked questions regarding breast reconstruction in PRS. We aimed to assess user preferences between the VideoBot and a traditional text-based chatbot for receiving information in the context of PRS consultation.

METHODS

We used Synthesia, an AI video generation platform, to create a lifelike human AI avatar.[14] The avatar was then integrated with ChatGPT 3.5, a language model, by integrating the model's responses to the top four most commonly asked questions regarding breast reconstruction. These top four questions were selected from a list of recommended questions to ask a plastic surgeon about breast reconstruction provided by the American Cancer Society.[15] We then used Tolstoy, a platform tailored for crafting interactive videos, to house the VideoBot, ultimately creating an interactive integration of the VideoBot which allowed users to engage with a human AI avatar that utilized ChatGPT functionality.[16] Figure 1 shows a screenshot of the interactive VideoBot with options to explore responses to the four most commonly asked questions regarding breast reconstruction. [**See Video (online)**, which provides a brief preview of the VideoBot.]

Takeaways

Question: Do patients prefer human AI VideoBots over traditional text-based chatbots for obtaining clinical education about breast reconstruction in PRS?

Findings: A 16-item online survey adapted from the 2005 validated measurement of online trust by Corritore et al was distributed to female participants via Amazon Mechanical Turk. Participants expressed a preference for the VideoBot because they found it more captivating than the text-based chatbot. Most participants would have preferred to see someone who they identified with in terms of gender and race.

Meaning: Although both the VideoBot and text-based chatbot are comparable in effectiveness, usability, and trust, participants prefer the interactivity and human-like qualities of the VideoBot.

As a comparator, we developed an automated text-based chatbot integrated with ChatGPT 3.5 that more resembled traditional chatbots. To do so, we used Zapier, a workflow automation software.[17] Although the Zapier PRS chatbot used a free text entry option, participants were prompted to type in the same four questions that were included in the PRS VideoBot. Like the PRS VideoBot, responses were generated by ChatGPT 3.5.

To gauge user perceptions and preferences between these two platforms, we adapted the validated measurement of online trust by Corritore et al to create a 16-item survey assessing users' perceptions on the credibility, perceived ease of use, and risk between the two platforms.[18] The following domains were included in the survey: honesty, expertise, predictability, perceived ease of use, risk, and trust. Each domain was measured using a 1–7 Likert scale, ranging from strongly disagree (1) to strongly agree (7). In addition, to direct questions about the domains, there was a free-text response that allowed respondents to include additional thoughts and views about their experience interacting with the VideoBot and chatbot.

Inclusion criteria for survey respondents were women who were older than 18 years of age, had at least a

Fig. 1. Screenshot of the interactive VideoBot platform with the four response options based on the four most commonly asked questions in breast reconstruction.

Table 1. Comparison of Perceptions of the VideoBot versus ChatBot among Female Respondents

	Truthful	Believable	Expertise	Content Expected	Surprises	Ease of Use	Unsafe	Risky	Trust
VideoBot	5.46	5.35	5.38	5.36	5.10	5.33	4.77	4.81	5.54
Chatbot	5.42	5.41	5.34	5.44	5.05	5.44	4.63	4.73	5.68
t test *P* value	0.60	0.45	0.62	0.35	0.56	0.23	0.25	0.49	0.09

bachelor's degree, and were citizens of the United States. The age and gender specifications were decided due to the Videobot and chatbot focusing on answering questions surrounding breast reconstruction. This survey was disseminated via Amazon Mechanical Turk.[19] Patients were compensated $0.50 for completing the survey. Alongside gathering the age of the survey participants, they were also asked if they have ever undergone a plastic and reconstructive surgical procedure. If they answered yes, they were also asked if they specifically underwent a breast reconstruction procedure following mastectomy or a breast-related medical procedure. Participants were then tasked with ranking their preferences between the VideoBot and text-based chatbot on the aforementioned seven domains. (**See questionnaire, Supplemental Digital Content 1,** which displays our adaptation of the 2005 validated measurement of online trust by Corritore et al. **http://links.lww.com/PRSGO/D526**). A form of informed consent was obtained by participants at the beginning of the survey before proceeding to the main portion of the survey. However, this study did not require institutional review board approval because all participants remained anonymous and no patient health information was collected.

For statistical analysis, mean score and standard error were calculated for VideoBot and ChatBot. An unpaired *t* test was utilized to look for statistical differences in mean scores between VideoBot and ChatBot. Statistical significance was designated at a *P* value of less than 0.05.

RESULTS

A total of 396 responses were gathered from women aged 18 to 64 years old. Most of the participants (73%) were aged between 25 and 34 years. Of the respondents, 97% had received a plastic or reconstructive surgical procedure and 95% of those patients underwent a breast-related surgical procedure. When comparing the VideoBot and chatbot, perceptions of truthfulness ($P = 0.5965$), believability ($P = 0.4834$), expertise ($P = 0.6208$), ease of use ($P = 0.2253$), and safety ($P = 0.2461$) were not significantly different. These results are shown in Table 1.

Although there was no difference in perceptions between the two platforms, the majority of participants preferred the VideoBot over the traditional chatbot (63.5% versus 28.1%), stating that they found the VideoBot to be more captivating than the text-based chatbot. Some respondents stated the following:

> "The video made the session more interesting and captivating. I felt I was in the presence of a real doctor."
> "The PRS VideoBot may offer a more comprehensive understanding of the breast reconstruction process by providing visual demonstrations, which could be beneficial for individuals who want a detailed explanation of the procedure."

However, many participants also provided interesting perspectives as to their preference of the traditional chatbot versus the VideoBot, with one participant quoting:

> "I chose the traditional chatbot, because I could read the info at my own pace and take the time needed to process the info. The video chat bot was very nice, but by necessity, he has to speak at an average pace. It just so happens that I don't follow the average speaking pace. I need to read text by phone or email in all communication so I don't get caught up in verbal info that I cannot process quickly."

When asked about the gender and race of the VideoBot, 77% of participants stated they preferred to see someone who they identified with in terms of their gender and race.

DISCUSSION

The findings of this study provide valuable insight into the perceptions and preferences of individuals with regard to obtaining information on breast reconstruction in the preconsultation phase. Specifically, this study analyzed the preferences amongst technological solutions, such as VideoBots and chatbots, in the context of acquiring answers to important clinical questions.

Firstly, it is noteworthy that a significant proportion of the participants in this study had undergone a plastic or reconstructive surgery procedure, with a substantial majority having undergone breast-related procedures. This demographic characteristic underscores the relevance of the findings to this specific subset of the population. The study found that perceptions of truthfulness, believability, content expertise, ease of use, and safety were similar between the VideoBot and chatbot. Across both the VideoBot and chatbot, perceptions of trust and truthfulness had the highest mean scores. Unsafe and risky had the two lowest mean scores, being between Likert values of "neither agree nor disagree" and "somewhat agree." This may suggest that users may view using these two resources as unsafe or risky for answering patients' questions. This is an interesting finding because the average scores for truthfulness and level of expertise scored between "somewhat agree" and "agree," reflecting that individuals may trust and believe the answers but feel utilization of the platforms for answering questions are substandard and unsafe and risky compared to meeting with a physician in person.

However, despite the similarities in perceived effectiveness between the VideoBot and chatbot, a clear preference emerged among participants for the VideoBot. A majority of respondents found the VideoBot to be more engaging than the traditional text-based chatbot. This preference for video-based interfaces may be attributed to several factors. Video content has been shown to be more engaging and memorable than text-based content, as it can convey information more dynamically and evoke emotional responses from viewers. Additionally, the human avatar element of the VideoBot may have enhanced participants' sense of connection and trust, as they were able to see facial expressions and gestures, which can convey empathy and sincerity.

In interpersonal communication, body language and facial expressions play a crucial role in conveying emotions, intentions, and attitudes. When two individuals interact, subtle cues such as gestures, posture shifts, and facial expressions enrich the exchange, adding depth and nuance to the conversation. These nonverbal elements often complement spoken words, providing additional layers of meaning and aiding in understanding. Moreover, faces are inherently captivating and memorable; they serve as focal points for connection and empathy. In comparing VideoBots to chat-based platforms, the inclusion of facial expressions and body language in video communication enhances engagement and comprehension, fostering more natural and immersive interactions. Unlike text-based communication, which lacks these visual cues, video interactions offer a more holistic and satisfying communication experience, making it easier to build rapport and forge genuine connections.

The preference for the VideoBot over the chatbot underscores the importance of incorporating multimedia elements into health care technologies to enhance user engagement and satisfaction. As health care becomes increasingly digitized, it is essential to leverage innovative technologies such as video-based interfaces to deliver personalized and compelling experiences to patients. In a VideoBot platform, individuals who are illiterate or struggle with reading at a higher level can benefit greatly from the audiovisual nature of communication. By listening to spoken words and observing facial expressions and body language, these individuals can better understand information, regardless of their literacy level. This aspect of VideoBot platforms holds significant potential for promoting equity in communication, as it ensures that all users, regardless of their literacy skills, can participate fully in conversations and access information effectively. By leveraging both auditory and visual cues, VideoBot platforms offer a more inclusive and accessible means of communication, bridging gaps and fostering equal participation for all users.

Additionally, this study reveals that a clear majority of participants (77%) expressed a preference for interacting with a provider with whom they could identify in terms of gender and race. A shared identity can foster trust, understanding, and a greater sense of comfort during medical interactions, particularly in the context of highly personal procedures such as breast reconstruction. Patients may feel more comfortable in believing and following medical advice when they perceive their provider as relatable and empathetic. Recognizing the importance of representation and diversity in health care settings can help ensure that patients from all backgrounds receive equitable and effective care tailored to their unique needs and preferences. These preferences highlight the importance of diversity initiatives by organizations like the American Society of Plastic Surgeons. Studies have shown that there continues to be a demographic difference amongst plastic surgeons. Additional studies have also shown that there continues to be racial disparities in academic plastic surgery with disproportionately low representation by non-White plastic surgeons.[20] With the ability to use human AI avatars of different races, the VideoBot would be a step toward addressing the disparity that currently exists in the field. However, the VideoBot is meant to serve as a supplementary resource to, rather than as a replacement of, the resources provided by a patient's surgeon.

Chatbot and videobot technologies offer transformative opportunities within the realm of plastic surgery consultation, revolutionizing the patient journey from initial inquiry to postoperative care. Patients can engage with these platforms at various stages, from the preliminary consultation phase, where they can ask questions about procedures and potential outcomes, to postoperatively where they can query the platforms to receive answers to common postoperative questions. Embracing these innovative platforms not only empowers patients by providing them with accessible information and personalized guidance but also enables providers to deliver more comprehensive, timely, and tailored care.

Although we feel strongly about the results of this study, there are limitations. Firstly, users had the ability to ask the traditional chatbot any questions related to breast reconstruction but were only allowed to ask certain common questions to the VideoBot with no flexibility in asking other questions. This was due to the technological limitations of not being able to fully integrate ChatGPT into the Synthesia.ai platform, along with restrictions set by the Tolstoy subscription plan we had. We hope to advance the technology of the VideoBot so that it functions as an open discussion, much like the text-based chatbot. Secondly, the respondents to this questionnaire may not be representative of the entire patient population because these individuals already have some background in the field. Perceptions of these platforms may be different for those who have never undergone a procedure as they may not have background knowledge on the field or of the procedures. We also want to acknowledge that we only collected data on age and that other demographic data, such as educational background and ethnicity, may have altered the final results. Additionally, we used a White, middle-aged man for the VideoBot avatar as the Synthesia platform only offered one option for avatars in the "medical" category at the time the VideoBot was created. We acknowledge that using an avatar of different sex and ethnicity could have yielded different results. We hope to address the impacts of race and gender on patient preference in

a future follow-up study. Lastly, the VideoBot and chatbot were only offered in English. Although inclusion criteria required that participants were citizens of the United States, we acknowledge that English may not be the participant's first language. The primary spoken language of the participants involved may certainly impact outcomes for experiences with both the VideoBot and chatbot. We hope to address this limitation by providing both resources in multiple languages in future studies.

CONCLUSIONS

This study highlights the preference for VideoBots over traditional chatbots among individuals who have undergone plastic or reconstructive surgery, with a specific focus on breast-related procedures. although both modalities were perceived similarly in terms of credibility and effectiveness, the engaging nature of the VideoBot was favored by a significant majority of participants. This underscores the potential of multimedia interfaces to enhance user engagement in health care settings. Additionally, the study emphasizes the importance of representation and diversity in health care technology, with participants expressing a preference for seeing someone they identify with in terms of gender and race. Moving forward, prioritizing inclusivity and innovation in health care technologies can lead to improved patient engagement outside the patient room.

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DISCLOSURES

Dr. Nazerali serves as a speaker/consultant/advisor to Mentor, MTF, and Telabio. All the other authors have no financial interest to declare in relation to the content of this article.

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