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The Journal of Medical Internet Research | Chatbot Conversations During COVID-19: Topic Modeling and Sentiment Analysis

On March 7, 2023

Tagged chatbot, conversational agent, COVID-19, discourse, global health, health information, infodemiology, infoveillance, public health, public perception, sentiment analysis, topic modeling

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JMIR Publications published "User-Chatbot Conversations During the COVID-19 Pandemic: A Study Based on Topic Modeling and Sentiment Analysis" in the Journal of Medical Internet Research, which mentions that chatbots became a promising tool to support public health initiatives during the COVID-19 pandemic.

This study examined the COVID-19 pandemic-related topics online users discussed with a commercially available chatbot and compared the sentiment expressed by users from five culturally different countries.

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From the analysis, the authors extracted 18 topics, which were categorized into five themes:

- 1. Questions asked to the chatbot,
- 2. Preventive behaviors,
- 3. Outbreak of COVID-19,
- 4. Physical and psychological impact of COVID-19, and
- 5. People and life in the pandemic.

They also found cultural differences, with users in the United States using more negative words compared to users in Asia when talking about COVID-19.

This work examined user-chatbot interactions on a live platform and provides insights into people's informational and emotional needs during a global health crisis. Users sought health-related information and shared emotional messages with the chatbot, indicating the potential of future chatbots to provide accurate health information and emotional support.

Dr Hyojin Chin from the Data Science Group Institute for Basic Science said, "Digital platform usage has increased tremendously during the COVID-19 pandemic." Chatbots are an emerging digital platform that has received considerable attention from public health initiatives during the novel coronavirus pandemic.

How users engage with health information may differ depending on the digital platform, and studies have been analyzing the idiosyncrasies of each platform. Studies on COVID-19, however, have been limited to literature reviews on existing chatbots and how they could be changed for the pandemic and a study on how to use AI techniques to make a COVID-19 chatbot.

This study offers a complementary perspective and examines user interactions with a commercial social chatbot during the first 2 years of the COVID-19 pandemic. Compared to previous work studying COVID-19 discourse on the internet, our research found that users are more Acceptance Commitment Therapy Tool

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likely to share negative emotions and personal stories with a chatbot than on social media.

Dr Chin and the research team reported in their JMIR Publications Research Output that they examined user conversations about COVID-19 with a commercial social chatbot using natural language processing tools and discovered a substantial amount of chat where users asked chatbots for health-related information and shared emotive messages, showing the potential of this novel digital channel to provide emotional support and disseminate accurate information in times of need.

Their findings demonstrate how people used the chatbot to seek information about the global health crisis, despite the chatbot not being designed as a resource for such information.

Users' expectations of chatbots to simultaneously play particular social roles, like engaging in small talk, show that these conversational agents may need to be created with various social functions. The sentiments expressed by users were also examined in relation to how these topics were discussed, showing that people were more likely to engage in emotional conversations with a chatbot than on social media. Additionally, given that people tend to be more open to chatbots when sharing negative emotions, chatbots can play an increasing role in meeting the emotional needs of users and helping alleviate depressive moods.

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