Artificial Intelligence Chatbot for Depression: Descriptive Study of Usage

**Background:** Chatbots could be a scalable solution that provides an interactive means of engaging users in behavioral health interventions driven by artificial intelligence. Although some chatbots have shown promising early efficacy results, there is limited information about how people use these chatbots. Understanding the usage patterns of chatbots for depression represents a crucial step toward improving chatbot design and providing information about the strengths and limitations of the chatbots.

**Objective:** This study aims to understand how users engage and are redirected through a chatbot for depression (Tess) to provide design recommendations.

**Methods:** Interactions of 354 users with the Tess depression modules were analyzed to understand chatbot usage across and within modules. Descriptive statistics were used to analyze participant flow through each depression module, including characters per message, completion rate, and time spent per module. Slide plots were also used to analyze the flow across and within modules.

**Results:** Users sent a total of 6220 messages, with a total of 86,298 characters, and, on average, they engaged with Tess depression modules for 46 days. There was large heterogeneity in user engagement across different modules, which appeared to be affected by the length, complexity, content, and style of questions within the modules and the routing between modules.

**Conclusions:** Overall, participants engaged with Tess; however, there was a heterogeneous usage pattern because of varying module designs. Major implications for future chatbot design and evaluation are discussed in the paper.

**Conclusions**

Research on chatbots is in the initial stages, and although findings show that chatbots can be effective, more information is needed on how they work. This study showed that although many individuals used the chatbot, there was large heterogeneity in user engagement across different modules, which appeared to be affected by the length, complexity, content, and style of questions within the modules and routing between modules. At the initial stages of mental health chatbot research, developers should aim to reach acceptable levels of usability and then focus on efficacy. To increase usability and engagement, the focus should be on developing short, simple, and consistent modules and testing them with small iterative studies. Then, developers can move toward expanding the content (or modules) of the chatbot. As with most digital interventions, the attrition rates significantly high; therefore, developing an extensive set of modules that users do not end up engaging with is not a good use of resources. Research on frameworks for developing engaging and effective chatbots offers the opportunity to create and test scalable interventions. Data from large studies on chatbots could lead to effective personalized interventions that could eventually answer the question of which intervention works for which individual.