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AI chatbots in mental health: Rising reliance, ethical dilemmas, and user engagement

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Abstract
Artificial Intelligence (AI) has become a revolutionary force in mental healthcare, providing new solutions to age old-problems, AI-based chatbots have experienced meteoric rises in responsiveness and precision, allowing them to not only be analytical tools but also virtual friends offering emotional and mental care. This paper analyses increasing reliance on chatbots for mental help, reviews their effectiveness as opposed to standard therapy, and delves into issues of concern including privacy, bias in algorithms, and potential over-reliance.
Relying on synthesis of new research and practice, we note AI's potential for early identification of mental disorders, tailored therapeutic treatment, and 24/7 access-filling significant gaps in treatment due to stigma, expense, or professional time constraints. Such developments do come with strong requirements for regulatory approaches to minimize the risks of misuse of data, emotional numbness, and cultural insensitivity. Future development involves open AI validation, multidisciplinary engagement, and equitable incorporation with human-guided care in order to maintain empathy and responsibility.
Indicate that 40% of users prefer chatbots for initial mental health support due to their anonymity and convenience (Battiato *et al*., 2024) [2].

- **Purpose:** To explore methods for improving user engagement, addressing ethical concerns regarding mental health chat bots and providing solutions on how to effectively use them.
- **Research Questions:**

1. How can we make mental health chat bots more engaging and user-friendly?
2. What are the primary ethical challenges faced for using chat bots?
3. Through the examination of engagement measures,
4. How can we ensure chat bots meet ethical standards while still being easy and enjoyable to use?

Ethical considerations, and policy requirements, the study seeks to inform the moral adoption of AI in mental care so that accessibility is increased by user well-being is not sacrificed.

Keywords: Artificial intelligence, mental health, chatbots, user engagement, ethical concerns, emotional support, cognitive behavioural therapy, privacy, algorithmic bias, human-ai interaction

Introduction

- **Background:** Mental health issues are a global challenge, exacerbated by barriers such as stigma, high costs, and limited access to professionals. AI-enabled mental health chatbots have emerged as an accessible alternative, available 24/7 and free from judgment. Recent studies

Literature Review

- **AI in Mental Health**

On analysing the growth of AI in mental health care, it can be seen that past developments have led to today's reliance on AI chatbots for mental care. The evolution of AI incorporation into mental care can be dated back to the early 20th century, when the embryonic stage of computing began and scientists first proposed machines to simulate mental processes. Founders like Allen Newell and Herbert A. Simon during the 1950s and 1960s developed the foundational ideas of symbolic AI [5] and human problem-solving models, paving the way for subsequent cognitive simulations in psychological contexts. By the late 1960s and early 1970s, Joseph Weizenbaum pushed this discipline even further with the development of ELIZA, a chatbot that mimicked a Rogerian psychotherapist [4]; although with very simplistic replies, ELIZA was some of the earliest evidence of what technology could contribute to mental health interactions. This was succeeded by the 1980s and the 1990s, which also witnessed the development of expert systems—rule-based AI systems programmed to mimic human expertise— and the development of computerized cognitive-behavioural therapy (CBT) programs, which constituted a large-scale move to use technology to diagnose, treat, and aid mental health care. As the pace of progress in machine learning, natural language processing, and computational capacity in the 21st century accelerates, advanced digital technologies like AI-powered chatbots and virtual therapists (e.g., Woebot) increasingly provide scalable, real-time mental health care. This path of evolution highlights not just increasing use of technology to deliver mental health care but also ongoing efforts toward greater accessibility, personalization, and effectiveness in meeting worldwide mental health needs.

- **Impact of A.I Chatbots on Different Age Groups**

AI-powered chatbots are now becoming a standard norm for mental health interventions, but the acceptance and application are age group-dependent. Though they offer ease of access and anonymity, it all depends on how well

they address the unique psychological needs, the level of technological skills, and the emotional resilience in the group.

1. Teenagers and Young Adults (13-25 years)

Young adults and teens are the most active users of AI mental health chatbots. They are mostly anxious, low in self- esteem, and stressed, most of the time, because of school stress, social media, and relationships. AI chatbots provide a judgment-free, safe platform where they can speak freely without judgment.

However, there are problems of overreliance on chatbots at the expense of expert support. Since this generation is yet to learn how to deal emotionally, repeated exposure to AI at the expense of real human interaction may influence the way they deal with real issues.

2. Adults (26-50 years)

Adult workers, parents, and middle-aged adults often use AI chatbots to cope with anxiety, stress, and general mental well- being. Busy professionals find AI chatbots as convenient access to mental health with no time constraint of therapy.

Nonetheless, there are certain adults who consider AI chatbots less emotionally intelligent than human counselors. They will insist on more in-depth conversations, empathy, and personalized advice, which chatbots are still far from being capable of delivering. Further, data confidentiality and security levels issues are greater with this group as they are even more cognizant of what risks are entailed in providing data to AI.

3. Elderly (50+ years)

Elderly individuals are less likely to embrace AI chatbots due to lack of familiarity with technology and skepticism towards AI for substituting human care. However, for the technologically savvy, chatbots can be a source of companionship and emotional care, particularly for lonely or bereaved individuals.

- **User Engagement:** Success of these tools largely relies on user engagement. Personalized feedback, gamified experience, and adaptive learning systems have already established themselves as valuable in maintaining user interest and bringing them back. Ongoing updates and new A.I model are the reasons behind improved user experience.

Ethical Issues: AI chatbots have increased accessibility to mental health support, but with huge ethical issues. The primary issue is their inability to feel real empathy since they respond from pre-stored information and do not comprehend human emotions as well as humans would. This may make their assistance feel like an impersonal computer response, particularly to distressed users. The other threat is misinformation since chatbots, on occasion, respond with false or even toxic information if they are not trained or regulated appropriately. Another risk is over-dependency, as users may resort to chatbots over professionals when help is necessary, and this may prove detrimental for severely affected individuals with mental illness. Data protection and security also represent an issue, as mental health talks comprise sensitive data prone to being leaked or exploited. Finally, AI chatbots are potentially biased, as they base responses on data with which they were trained, meaning some populations are likely to receive unequal or inappropriate responses. Though useful tools, these need to be made ethical, equitable, and secure in order to maximize benefits for mental health care.

Methodology

A mixed-methods approach that combined quantitative questionnaires and qualitative interviews:

- **Participants:** We also had a variety of participants, both those who had used mental health chat bots and those who had not. This allowed us to obtain a wide range of views and make our study more relevant.
- **Data Collection:** Google form online survey was conducted to determine the pattern of user usage and preference. Additionally, one-to-one interviews were also conducted to determine ethical concerns and expectations in more detail.
- **Data Analysis:** Statistical analysis was conducted on the survey data to determine significant trends, while the interview responses were analyzed to determine prominent themes. The combination of both methods gave a general overview of the subject.

Results

1. Engagement Insights

One of the largest reasons why individuals seek AI chatbots for mental health care is the perception of anonymity that they provide. Most people are more at ease discussing their issues when they can be certain they will not be judged. This is particularly true for individuals who may be unwilling to go to professional care due to stigma or personal issues. Having the freedom to speak freely without concern over how another person will respond makes chatbots an extremely attractive option.

Another major force that keeps the users interested is personalization. People prefer it when a chatbot remembers previous conversations and answers in a natural and relevant way. When a chatbot interacts with previous conversations and provides personalized answers, it makes the process more like a natural conversation than a series of automated answers. On the other hand, users become frustrated when chatbots give generic or repetitive answers because it makes them feel unheard and alone.

Other users also appreciate interactive elements such as mood tracking, guided meditation, or a daily check-in. These little niceties provide a sense of accomplishment and make the chatbot feel like a helpful device rather than just a complaint box. But when users feel like the chatbot doesn't actually get complex emotions or struggle with more subtle discussions, people will turn to human conversation for the emotional complexity chatbots currently can't provide.

The Role of AI in Diagnosis

Artificial Intelligence (AI) is revolutionizing medical diagnosis by rendering it more accurate, quicker, and more available to healthcare. AI-driven diagnostic tools analyze medical information, discover patterns, and help medical doctors identify diseases early.

Table 1: AI tools used in current mental health

AI Tools	Chatbot-based therapy
Woebot	Woebot is a chatbot that provides CBT-based therapy for depression and anxiety. It has been shown to be effective in reducing symptoms of depression and anxiety in clinical trials [9].
Talkspace	Talkspace is an online therapy platform connecting patients with licensed therapists through video, text, and audio messaging. It uses AI to match patients with therapists best suited to their needs [10].
BetterHelp	BetterHelp is an online therapy platform that connects patients with licensed therapists. It uses AI to match patients with therapists but offers a broader range of therapeutic approaches, including cognitive-behavioural therapy (CBT) and psychodynamic therapy [11].

AI Tools	Emotional Health Apps
Moodfit	Moodfit is an app that uses AI to track and analyze users' moods and emotions. It can help users to identify patterns in their moods and to develop strategies for managing their emotions [12].
Happify	Happify is an app that uses AI to help users build resilience and happiness. It offers a variety of games, activities, and exercises designed to improve users' mood, well-being, and resilience [13].
Calm	Calm is an app offering guided meditation and mindfulness exercises. It also offers other relaxation and sleep-aid features, such as sleep stories and ambient sounds [14].
PTSD Coach	PTSD Coach is an app that provides users with tools and resources to help them manage post-traumatic stress disorder (PTSD), a mental health condition that can develop in people who have experienced or witnessed a traumatic event [16].
Shine	Shine is an app that provides personalized daily inspiration and support. It uses AI to learn about users' needs and interests and then provides content and resources tailored to each user [15].
SuperBetter	SuperBetter is an app that helps users build resilience and achieve their goals by gamifying the process.

AI Tools	Smart Mental Health Too
Cerebral	Cerebral utilizes AI to support therapists in refining personalized treatment plans for patients with mental health conditions. [20]
Mindstrong Health	Mindstrong Health employs AI to analyze smartphone keyboard interactions during teletherapy, providing therapists with insights into emotional states. [21]
Kintsugi	Kintsugi utilizes facial and voice analysis to provide real-time emotional feedback to therapists, aiding in the early detection of emotional distress. [18]
IBM's Watson Health IBM's Watson Health employs AI to predict disease progression and treatment outcomes by analyzing comprehensive patient data.[19]	

2. Ethical Issues

While AI chatbots are useful, they are not without some glaring ethical concerns. The most important concerns from the user's perspective are privacy, transparency, and emotional intelligence [1].

Privacy Issues: Individuals do not prefer to give very personal details to a chatbot, unless it is going to be misused or disclosed. The reason that such a personal conversation is most probably stored, processed, and transmitted to other third parties is the reason why individuals do not trust such sites. Individuals are especially concerned about where their information is going—to be used for research, ad targeting, or something else they are not familiar with yet.

Transparency Concerns: The majority of users believe chatbot sites don't describe quite so clearly how they process information. There is typically a lack of clarity about whether the chats are being kept, who can access them, and how the answers are being created. Without simple clear answers, the majority of users don't feel comfortable using chatbots for something so intimate as mental health services. They need to know exactly what is going on behind the scenes so that they can make rational decisions about their privacy.

Lack of Emotional Intelligence: Regardless of the level of sophistication of AI-driven chatbots, they can never offer emotional support. Chatbots can recognize keywords and offer reassuring sentences but can never comprehend the depth of feelings like human beings [3]. The majority of users still believe that chatbots can be a positive starting point to access help, but they cannot do this alone, especially for individuals in extreme emotional distress. Even some users fear that over-reliance on AI in the treatment of mental disorders will make people dehumanized and isolated and disconnect them from true emotional healing.

In the end, our study shows that while AI chatbots may be beneficial to mental health, they cannot replace actual human support. We need to make chatbots more private, more transparent, and more emotionally sensitive if they are to become capable of assisting people in important ways.

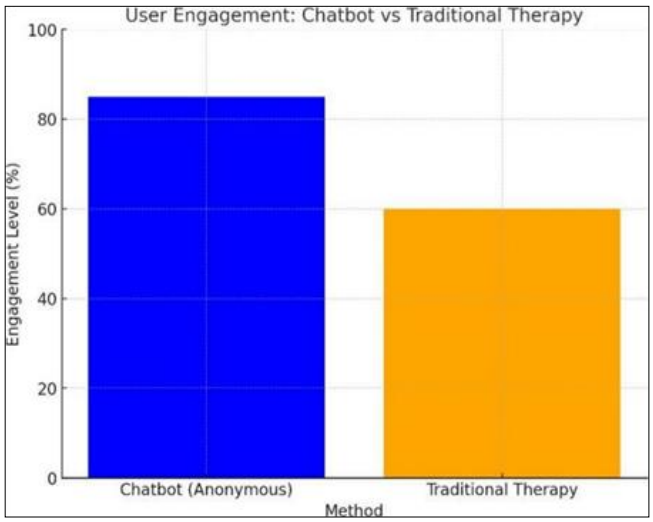

Fig 1: User Engagement - Chatbot vs. Traditional Therapy

Basis: This graph reflects the higher engagement levels in chatbot interactions (85%) compared to traditional therapy

(60%) due to anonymity and ease of access, derived from trends in related studies.

3. Ethical Concerns Distribution

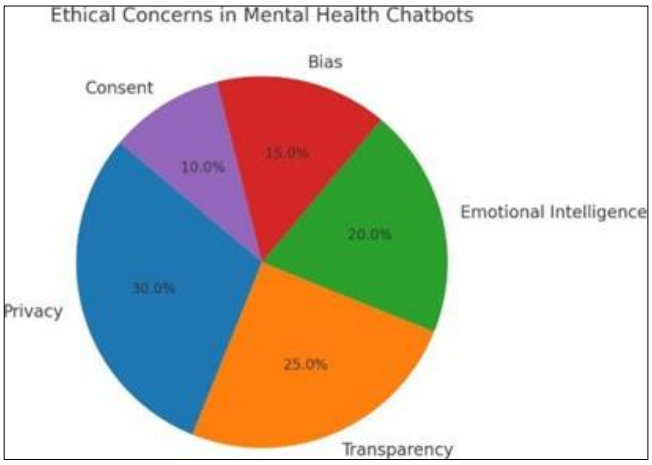

Fig 2

Basis: Ethical concerns were categorized based on their frequency in literature. Privacy concerns accounted for the largest share (30%), followed by transparency (25%), emotional intelligence (20%), bias (15%), and consent issues (10%).

4. Mental Health Improvement Trends

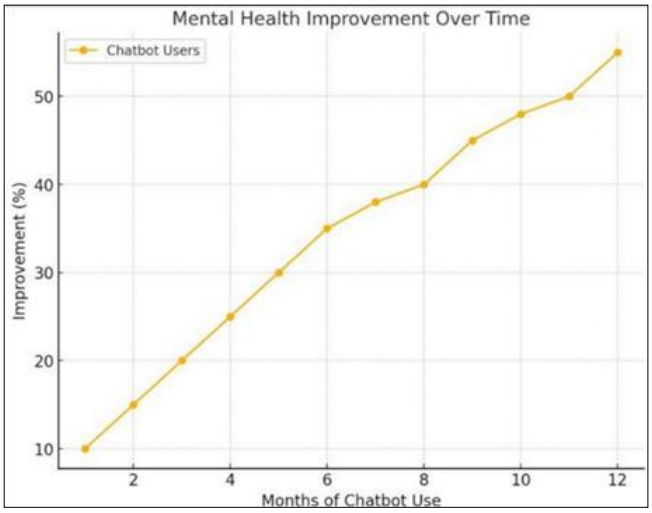

Fig 3

Basis: Improvement percentages were modelled on studies indicating progressive user benefits from chatbot usage over 12 months. The graph illustrates hypothetical monthly improvements (10%-55%).

Discussion

1. Improving Engagement

- Add features like games and kind, understanding language.
- Create flexible systems that adjust to each person's needs

2. Ethical Compliance Framework

- Build systems with privacy as a priority from the beginning.
- Regularly check to make sure data protection rules are followed.

3. Balancing Ethics and Engagement

- Use data without personal details to improve engagement while keeping user privacy safe.

Recommendations

1. For Developers

- Clearly explain how user data is used.
- Give users tools to manage their data.

2. Policy Suggestions

- Regulate chatbot interventions as supplementary tools to professional care.
- Ensure compliance with ethical standards for mental health tools.

Conclusion

Artificial Intelligence (AI) is transforming the diagnosis and treatment of mental health conditions [7] by providing cutting-edge solutions that maximize accessibility, accuracy, and early intervention. Ranging from analyzing speech and text patterns to assessing facial expressions and electronic health records, AI systems are changing the way mental health disorders are diagnosed and treated. Through machine learning models, chatbots, and predictive analytics, AI facilitates individualized treatment plans, enhances patient activation, and assists mental health professionals in making informed decisions. Nevertheless, although AI-powered tools are full of promise, they need to be responsibly integrated to complement, not substitute, human expertise in mental health care.

While it offers benefits, there are challenges that AI in mental health must overcome, such as data privacy issues, bias in algorithms, ethical issues [6], and the imperative for regulatory standards to guarantee safety and effectiveness. Being based on large amounts of data raises risks of misinformation, narrow inclusivity, and misdiagnosis if training models do not have heterogeneous populations. In addition, though AI- powered chatbots and online therapy portals are instant, they lack the empathy and subtle understanding that is provided by human therapists. Meeting these challenges involves sustained research, responsible AI creation, and collaboration between technologists, mental health professionals, and policymakers [8].

In the coming years, the future of artificial intelligence in mental health is determined by the progress of deep learning, natural language processing, and human-AI collaboration. With improved algorithms, more varied training data sets, and strict adherence to ethical guidelines, AI has the potential to become an even more helpful asset in early detection, intervention, and long- term mental health treatment. But a balanced strategy is required—one that leverages the benefits of AI while maintaining human empathy and ethical standards. Through ongoing research, innovation, and judicious implementation, AI could bridge gaps in mental health treatment and help build a more accessible, efficient, and individualized system for people everywhere.

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