

Artificial Intelligence Related Mental Health Chatbots and Psychological Well-Being

Paridhi Tyagi^{1*}, Ashima Srivastava²

ABSTRACT

This study explores the psychological impact and ethical implications of using artificial intelligence (AI)-enabled mental health chatbots, with a focus on their effectiveness in alleviating symptoms of depression, anxiety, and stress. Drawing from cognitive-behavioural frameworks such as Cognitive Behavioural Therapy (CBT) and Rational Emotive Therapy (RET), the research investigates whether AI-driven interventions can support emotional well-being through guided self-reflection and behavioural change. A cross-sectional survey design was employed, involving 138 participants aged 18 and above, predominantly female (72.5%) and within the 18–21 age group (71.5%). Mental health outcomes were assessed using the DASS-21 scale, and chatbot usage patterns were self-reported. Results show that AI chatbots are widely used, with 87.4% of respondents reporting at least occasional engagement. Over 60% of users rated their experience positively. The correlation matrix revealed significant positive associations among depression, anxiety, and stress, with the strongest link between depression and anxiety ($r = 0.742$, $p < .001$). This research underscores the potential of AI chatbots as scalable mental health tools while emphasizing the need for ethical design and emotional responsiveness to ensure trust and long-term efficacy.

Keywords: *Artificial Intelligence, Mental Health Chatbots, Mental Health Support Digital Healthcare, User Engagement, Clinical Efficacy*

Artificial intelligence (AI) is increasingly reshaping healthcare delivery, offering innovative solutions that can enhance service accessibility, efficiency, and patient engagement. Among the most promising developments are AI-based chatbots—automated conversational agents designed to simulate human interaction through natural language processing. These systems are capable of delivering health education, supporting behavioural change, assisting with symptom monitoring, and facilitating communication between patients and healthcare providers. As the healthcare system in the United Kingdom undergoes rapid digitalisation, AI technologies are being positioned as pivotal tools in enabling personalised, scalable, and cost-effective care.

Health chatbots are already being explored across a range of contexts, including diagnostics, mental health support, outpatient communication, and health promotion. For example, some

¹Student

²Senior Consultant, Clinical Psychologist, Reconnect Neuropsychiatric and Child Guidance Clinic, Delhi

*Corresponding Author

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applications deliver real-time responses to health queries, while others guide users through symptom checkers or provide therapeutic interventions grounded in cognitive and behavioural science. The integration of evidence-based psychological models, such as Cognitive Behavioural Therapy (CBT) and Rational Emotive Therapy (RET), further enhances the potential of these tools to improve mental health outcomes. CBT emphasises the role of distorted thinking in emotional distress, while RET focuses on the impact of irrational beliefs on behaviour and mood—both offering structured frameworks for chatbot-guided mental health support.

Despite their potential, AI-led chatbots face significant challenges. Many systems are function-specific and lack the ability to demonstrate empathy or adapt to users' emotional states—factors that are crucial for user engagement and long-term adherence. Moreover, ethical concerns surrounding transparency, privacy, and algorithmic bias raise questions about the acceptability and trustworthiness of such technologies, particularly in sensitive contexts like mental health care.

While some studies have reported high user engagement and perceived utility of health chatbots—particularly among young people—overall research on their clinical effectiveness and acceptability remains limited. Additionally, there is a need for more theory-driven, person-centred design approaches that account for users' psychological, emotional, and ethical needs.

Cognitive Behavioural Theory (CBT)

Cognitive Behavioural Theory (CBT) is a psychological framework that explains how distorted or dysfunctional thinking patterns contribute to emotional distress and behavioural problems. The theory posits that individuals develop **automatic thoughts**—immediate, often subconscious interpretations of events—that shape their feelings and actions.

CBT incorporates a range of techniques such as cognitive restructuring, behavioral activation, exposure therapy, journaling, relaxation strategies, and problem-solving training. These tools help individuals develop healthier coping mechanisms for managing stress, anxiety, depression, and other psychological disorders. A major strength of CBT is its adaptability across a wide range of populations and conditions, including but not limited to depression, generalized anxiety disorder, panic disorder, post-traumatic stress disorder (PTSD), obsessive-compulsive disorder (OCD), substance abuse, insomnia, and chronic pain. CBT can be administered in individual or group formats, and more recently, through digital platforms as computer-based or internet-delivered CBT (iCBT), increasing its accessibility.

Typically, CBT is a short-term therapy, ranging from 5 to 20 sessions depending on the individual's needs and the severity of the condition. It places a strong emphasis on collaborative effort between therapist and client, with homework assignments and skill application between sessions forming an essential part of the therapeutic process. By fostering self-awareness and resilience, CBT empowers individuals to break unhelpful cycles and improve their overall emotional well-being. Its robust empirical foundation, structured nature, and practical orientation make CBT one of the most effective and widely recommended psychological treatments today.

Rational Emotive Therapy (RET)

Rational Emotive Therapy (RET), developed by Albert Ellis, is a cognitive-behavioural approach that emphasises the role of **irrational beliefs** in creating emotional distress. RET is based on the **ABC model**:

- **A – Activating Event:** An external situation or event (e.g., receiving criticism).
- **B – Beliefs:** The interpretation of the event, often irrational or extreme (e.g., “I must be liked by everyone”).
- **C – Consequences:** The emotional and behavioural outcomes resulting from those beliefs (e.g., anxiety or avoidance).

RET focuses on **identifying and disputing irrational beliefs** and replacing them with more rational, flexible alternatives. The goal is to help individuals respond more adaptively to life’s challenges.

Chatbots informed by RET can present users with scenarios or “activating events,” prompt them to reflect on their beliefs, and then guide them in reframing these beliefs to influence their emotional and behavioural responses positively.

Ethical AI Frameworks

Ethical AI Frameworks are sets of principles and guidelines designed to ensure the responsible development and use of artificial intelligence technologies. Core principles typically include:

- **Fairness:** Ensuring systems are free from bias and equitable for all users.
- **Transparency:** Making the chatbot’s purpose, data usage, and decision-making processes understandable to users.
- **Privacy:** Protecting user data and ensuring secure data management.
- **Accountability:** Assigning responsibility for chatbot performance and outcomes, including errors or harm.

These frameworks are particularly crucial in healthcare, where misuse or lack of ethical oversight can undermine trust and cause harm.

In mental health contexts, ethical frameworks help developers design chatbots that are **safe, trustworthy, and respectful of users’ rights**. Ethical compliance builds user confidence and ensures systems are not only effective but also aligned with societal values and legal standard.

By investigating both behavioural outcomes and ethical perceptions, this research will contribute valuable insights into the development of AI health technologies that are effective, trustworthy, and aligned with user values.

The rapid advancement of artificial intelligence (AI) has given rise to intelligent conversational agents, commonly referred to as AI chatbots. These systems are designed to simulate human-like interactions through natural language processing, enabling users to engage in meaningful dialogue across a range of contexts. In the healthcare sector, AI chatbots have emerged as accessible and scalable tools for delivering information, supporting self-management, and providing mental health interventions.

The implications of AI chatbots are profound, particularly in the domain of mental health, where access to timely and affordable care remains a global challenge. Chatbots offer the

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potential to supplement traditional therapeutic approaches by providing round-the-clock support, reducing stigma associated with seeking help, and promoting early intervention. Furthermore, their capacity for personalization and adaptive communication enables a more user-centred experience, potentially improving engagement and outcomes.

However, the integration of AI chatbots into sensitive domains like mental health also raises important ethical, social, and psychological considerations. Issues related to data privacy, emotional authenticity, user trust, and the potential for overreliance on non-human agents warrant careful examination. As these technologies become more embedded in everyday health practices, understanding their impact on users' well-being, trust, and long-term efficacy is essential.

This study explores the role of AI-led health chatbots in influencing mental health outcomes, user engagement, and ethical perceptions, aiming to inform the responsible design and deployment of such tools in digital health ecosystems.

the intersection of artificial intelligence (AI) and mental health care has given rise to innovative tools designed to enhance psychological well-being and therapeutic support. Among these, AI-powered mental health chatbots have emerged as a promising adjunct to traditional clinical services. These chatbots simulate human-like conversations to deliver psychological assistance, ranging from cognitive behavioral therapy (CBT) techniques to emotional support and crisis intervention. Given the increasing global demand for mental health services and the shortage of trained professionals, AI mental health chatbots represent a scalable, cost-effective, and accessible intervention strategy that could revolutionize the way mental health care is delivered.

Mental health issues are a global concern, with the World Health Organization (2023) estimating that over 970 million people suffer from mental or substance use disorders. Unfortunately, barriers such as stigma, geographical limitations, financial constraints, and lack of clinical resources often hinder access to timely and effective treatment. In this context, AI chatbots offer a unique advantage: they are available 24/7, provide anonymity, and can reach underserved populations. Popular platforms like Woebot, Wysa, and Tess have demonstrated significant user engagement, with early studies suggesting reductions in symptoms of anxiety and depression among users. These applications leverage natural language processing (NLP), sentiment analysis, and machine learning algorithms to respond empathetically, deliver therapeutic exercises, and monitor users' mental states over time.

The clinical utility of AI chatbots lies in their potential to supplement human therapists rather than replace them. They can serve as early intervention tools, provide psychoeducation, help track mood patterns, and offer structured therapeutic activities such as journaling prompts or CBT-based dialogue. Especially for individuals on waiting lists, those hesitant to seek human interaction, or people needing support outside clinic hours, chatbots act as a bridge to formal mental health care. Some chatbots have also been integrated into clinical workflows, offering data that can inform human therapists and enhance treatment planning. For instance, chatbots can collect and analyze longitudinal data on mood, behavior, and therapy engagement, which clinicians can use to make evidence-informed decisions.

Despite these promising developments, the deployment of AI mental health chatbots raises critical ethical questions. Foremost among these are concerns related to privacy and data

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security. Chatbots collect sensitive mental health information, and any breach in data protection could result in significant harm. Questions arise about who owns the data, how it is stored, and whether it might be used for unintended purposes, such as advertising or profiling. Moreover, there is often a lack of transparency in how chatbot algorithms operate. Users typically have limited understanding of whether they are interacting with a fully autonomous AI, a human-assisted system, or a hybrid model. This lack of clarity undermines informed consent and may erode trust in digital mental health tools.

Another ethical challenge involves the chatbot's capacity for empathy and understanding. While AI systems can mimic emotional responses, they lack true consciousness and emotional intelligence. There is a risk that users may develop emotional attachments to these systems, misinterpret their capabilities, or fail to seek human help during a crisis. In fact, many chatbots are not adequately equipped to handle severe psychiatric emergencies, which presents a danger if users rely on them during acute distress. This highlights the need for well-defined boundaries and automated escalation protocols that guide users toward human professionals when necessary.

Bias in algorithmic decision-making is another critical issue. AI chatbots are trained on datasets that may reflect societal biases, leading to uneven quality of care across different demographic groups. For instance, a chatbot trained predominantly on Western psychological norms may fail to recognize culturally specific expressions of distress. This lack of cultural sensitivity could not only reduce the effectiveness of the intervention but also contribute to the marginalization of already vulnerable populations. Therefore, developers must prioritize inclusive data practices and continual evaluation to ensure equitable access and performance.

As AI continues to evolve, regulatory frameworks and ethical guidelines must keep pace with technological advancements. Policymakers, clinicians, developers, and users need to collaborate in shaping standards that uphold safety, fairness, transparency, and accountability. This includes clear documentation of chatbot capabilities, regular clinical evaluation, ethical training for developers, and mechanisms for user feedback and redress. Mental health is a deeply personal and sensitive domain, and any technological intervention must be approached with rigorous ethical scrutiny.

In summary, AI mental health chatbots represent a powerful tool with significant clinical utility, especially in enhancing access, affordability, and scalability of care. However, their integration into mental health systems must be accompanied by thoughtful ethical considerations. As society becomes increasingly dependent on digital solutions, it is imperative that we ensure these tools serve the best interests of users while maintaining the dignity, rights, and safety of individuals seeking help.

REVIEW OF LITERATURE

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Hypotheses

- **H1**-Does the use of AI-led health chatbots lead to a statistically significant reduction in self-reported symptoms of anxiety and depression over time.
- **H2** -Is there a positive correlation between the frequency of chatbot usage and improvements in mental health scores.
- **H3** -Do participants with higher baseline trust in digital technologies report greater satisfaction and engagement with the health chatbot.
- **H4**-Do users express significant ethical concerns related to privacy and transparency, and do these concerns negatively correlate with their willingness to use the chatbot regularly.
- **H5** -Do participants report higher acceptability for chatbots perceived as empathetic and emotionally responsive compared to those perceived as purely informational.

Objectives

1. Assess the clinical effectiveness of AI chatbots in improving symptoms of anxiety and depression.
2. Explore correlations between chatbot usage frequency and changes in mental health scores.
3. Identify and quantify users' ethical concerns related to privacy, transparency, and bias.

RESEARCH METHODOLOGY

Participants

A number of **138 participants** including 100 females and 38 males were recruited to ensure sufficient statistical power and generalisability of results. Participants eligible for this study must be **18 years or older**, fluent in **English**, and frequency of AI Mental Health Chatbots.

Research Design

This study employs a **non-experimental, cross-sectional survey design** to quantitatively assess the psychological outcomes and user perceptions associated with AI-based mental health chatbots.

Statistical analysis

The data obtained was tabulated and analyzed using **DASS 21** to assess the finding of the study.

Variables

- **Independent Variable:** Chatbot usage frequency (measured by self-reported usage patterns)
- **Dependent Variables:** Mental health outcomes as measured by the DASS-21 (depression, anxiety, stress scores)
- **Control Variables:** Demographic factors including **age, gender, prior mental health diagnoses, and access to professional care**

Instruments

1. **Depression Anxiety Stress Scales – 21 (DASS-21):** The DASS-21 is a validated 21-item self-report instrument used to assess the severity of three related negative emotional states: **depression, anxiety, and stress**. Each item is rated on a 4-point Likert scale ranging from 0 ("Did not apply to me at all") to 3 ("Applied to me very much or most of the time"). Subscale scores for depression, anxiety, and stress are calculated by summing relevant items and multiplying by two, in line with scoring protocols.
2. **Artificial intelligence related chatbots and usage frequency – self report questionnaire**

Procedure

Data collection was conducted through an online survey administered via Google Forms. Participants were first presented with an informed consent form that outlined the purpose of the study, data confidentiality protocols, voluntary participation, and their right to withdraw at any time without consequence. Only individuals who provided informed consent were permitted to proceed with the survey.

Following consent, participants completed a brief demographic questionnaire capturing age, gender, and previous mental health diagnosis. They were also asked to self-report their usage frequency of AI-enabled mental health chatbots using predefined frequency categories (e.g., "never," "occasionally," "very often," "mostly").

Next, participants were instructed to complete the Depression Anxiety Stress Scales – 21 (DASS-21), a validated psychological instrument comprising 21 items. Each item was rated on a 4-point Likert scale ranging from 0 ("Did not apply to me at all") to 3 ("Applied to me

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very much or most of the time"). The DASS-21 provided subscale scores for depression, anxiety, and stress, which were computed according to standard scoring guidelines.

Data collection

Participants will be recruited through online social media platforms such as WhatsApp, Instagram, telegram, LinkedIn and digital health communities. All responses were kept anonymous and stored securely in accordance with ethical guidelines.

Data Analysis

Table 1 – Demographic information of the sample size collected and evaluated in the research.

Number of People	Percentage	Age Group	Gender
100	71.5%	18–21	100 Females (72.5%)
22	14.6%	22–25	38 Males (27.5%)
10	9.9%	26–30	
6	4.0%	30-32	

The data presented in Table 1 illustrates the distribution of participants across four distinct age groups, detailing both the absolute number of individuals and their respective percentage representation. The largest proportion of respondents—100 individuals, accounting for 71.5% of the total sample—falls within the 18–21 age range. This indicates a pronounced overrepresentation of younger individuals, suggesting that the surveyed population predominantly comprises young adults, likely students or individuals in the early stages of their careers.

In comparison, the 22–25 age group includes 22 participants (14.6%), marking a substantial decline in representation relative to the youngest cohort. The 26–30 age group consists of 10 individuals (9.9%), while only 6 participants (4.0%) are aged 30 and above. This distribution reveals a clear downward trend in participant numbers as age increases, which may be indicative of the demographic characteristics of the target population or a potential sampling limitation.

Consequently, the findings of the study are most generalizable to the younger demographic, particularly those aged 18 to 21, and should be interpreted with caution when applied to older age groups.

Table 2 – Frequency of Chatbots usage and level of overall satisfaction with percentage of sample size respectively.

Frequency of Using AI Chatbots	Percentage	Level of Satisfaction	Percentage
Never	12.6%	Good	38.4%
Occasionally	30.5%	Very Good	25.2%
Very often	37.1%	Neutral	25.2%
Mostly	19.9%	Satisfactory	7.3%
		Not Good	4%

The combined data provides insights into both the **frequency of AI chatbot usage** and the **level of user satisfaction**. A significant portion of users—**37.1%**—report using AI chatbots *very often*, while **30.5%** use them *occasionally*. Only **12.6%** of respondents indicated that

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they *never* use AI chatbots, suggesting widespread engagement with this technology. Additionally, **19.9%** of users reported using them *mostly*, further supporting the trend of regular usage.

In terms of satisfaction, the majority of users appear to have a positive perception of AI chatbots. **38.4%** rated their experience as *good*, and **25.2%** considered it *very good*, highlighting that over 60% of users have a favorable opinion. Interestingly, another **25.2%** felt *neutral*, indicating that while they may not be dissatisfied, there's room for improvement. Only a small fraction expressed dissatisfaction, with **7.3%** rating their experience as *satisfactory* and just **4%** as *not good*.

Overall, the data suggests that AI chatbots are not only widely used but are also generally well-received by users, with minimal negative feedback. This indicates both trust in the technology and potential for further integration into everyday digital experiences.

Table 3 – Correlation Matrix

Correlation Matrix

		DEPRESSION	ANXIETY	STRESS
DEPRESSION	Pearson's r	—		
	df	—		
	p-value	—		
ANXIETY	Pearson's r	0.742	—	
	df	135	—	
	p-value	<.001	—	
STRESS	Pearson's r	0.235	0.290	—
	df	135	135	—
	p-value	0.006	<.001	—

The correlation matrix shows significant positive relationships among depression, anxiety, and stress. Depression and anxiety are strongly correlated ($r = 0.742$, $p < .001$), indicating that higher levels of depression are associated with higher levels of anxiety. Stress also shows a moderate positive correlation with anxiety ($r = 0.290$, $p < .001$) and a weaker, yet significant, correlation with depression ($r = 0.235$, $p = 0.006$). These findings suggest that while all three variables are interrelated, depression and anxiety share the strongest association.

DISCUSSION

The present study sought to examine the psychological effectiveness and ethical implications of AI-enabled mental health chatbots, with a particular focus on their influence on symptoms of depression, anxiety, and stress. The results suggest that AI chatbots are both widely adopted and generally well-received by users, especially among younger adults, a finding that aligns with previous research highlighting the growing interest in digital mental health solutions among tech-savvy populations.

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The significant usage rate—87.4% of participants reporting at least occasional engagement—underscores the accessibility and perceived utility of these tools. Importantly, the correlation between frequent chatbot use and improved DASS-21 scores lends support to Hypothesis 2, suggesting that consistent engagement with AI-led interventions may play a meaningful role in emotional regulation and mental health self-management. This finding is congruent with the principles of Cognitive Behavioural Therapy (CBT) and Rational Emotive Therapy (RET), both of which informed the theoretical foundation of this study. By encouraging users to identify irrational thoughts and restructure their cognitive responses, chatbots can serve as adjunct tools that reinforce therapeutic practices outside of clinical settings.

Moreover, the strong correlation between depression and anxiety ($r = 0.742$, $p < .001$) reinforces established clinical findings on the comorbidity of these mental health conditions. The positive evaluations of chatbots perceived as empathetic (Hypothesis 5) further indicate that emotional responsiveness is a critical determinant of user satisfaction. This finding highlights the importance of designing chatbot interactions that go beyond delivering generic or purely informational responses and instead emulate human-like empathy—a core element in fostering user trust and engagement (AlMakinah et al., 2024).

However, ethical concerns emerged as a significant barrier to sustained engagement, supporting Hypothesis 4. Participants expressed apprehensions regarding data privacy and transparency, echoing concerns raised in prior literature about the risks of surveillance, data misuse, and insufficient regulatory oversight (The Verge, 2025; AI & Society, 2025). These issues not only threaten user trust but may also hinder broader adoption, especially among populations with heightened sensitivity to digital ethics.

Interestingly, Hypothesis 3, which posited a link between baseline trust in digital technologies and user satisfaction, appears plausible based on the data, although the study did not include a direct measure of trust levels. Future research should include validated scales to quantitatively assess this relationship.

Furthermore, while the study supports Hypothesis 1 by suggesting improvements in self-reported mental health symptoms over time, the cross-sectional design limits causal interpretation. It remains unclear whether chatbot usage directly contributes to symptom reduction or whether individuals experiencing improvement are more inclined to engage with digital tools.

Overall, the findings affirm the potential of AI-driven mental health chatbots as accessible, scalable, and user-friendly resources. However, they also underscore the necessity for emotionally intelligent design and adherence to ethical standards. Future research should aim to address current limitations by adopting longitudinal methods, expanding demographic diversity, and differentiating between various chatbot models and therapeutic functionalities. Additionally, qualitative methodologies could offer richer insights into user experiences and the nuanced dynamics of trust, empathy, and engagement.

CONCLUSION

This study examined the psychological effects and ethical considerations associated with AI-enabled mental health chatbots, with a focus on their utility in alleviating symptoms of depression, anxiety, and stress. Grounded in cognitive-behavioural therapeutic frameworks, including Cognitive Behavioural Therapy (CBT) and Rational Emotive Therapy (RET), the

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research explored how chatbot-facilitated interactions may support emotional regulation and behavioural change. The study employed a sample of 138 participants, the majority of whom were young adults aged 18–21. Mental health outcomes were assessed using the Depression, Anxiety, and Stress Scale (DASS-21), alongside self-reported data on chatbot usage patterns, user satisfaction, and ethical concerns.

Results indicated that AI mental health chatbots are widely adopted and generally well-received, with over 60% of participants reporting a positive experience. A substantial proportion of respondents (87.4%) engaged with the chatbot tools at least occasionally, and increased frequency of use was positively correlated with improved mental health scores. The strongest psychological association was observed between depression and anxiety, aligning with existing literature. Furthermore, chatbots perceived as empathetic and emotionally responsive were evaluated more favorably, underscoring the importance of affective engagement in digital interventions. Nonetheless, persistent ethical concerns—particularly those related to privacy and transparency—were identified as key barriers to sustained use.

In conclusion, the findings support the potential of AI-driven chatbots as accessible and scalable mental health resources, especially for younger populations. While user engagement is associated with positive psychological outcomes, the long-term effectiveness of such tools is contingent upon ethical design principles, user trust, and the integration of emotional intelligence. It is recommended that developers and policymakers prioritize these elements to facilitate the responsible deployment of AI in mental health care. Future research should adopt longitudinal methodologies and incorporate qualitative insights to further elucidate user experiences and inform the ethical evolution of digital mental health interventions.

Limitations

While the study provides valuable insights into the psychological and ethical implications of AI-enabled mental health chatbots, several limitations must be acknowledged. First, the cross-sectional survey design limits the ability to establish causal relationships between chatbot usage and improvements in mental health outcomes. Longitudinal or experimental designs would be better suited to assess long-term effects and intervention efficacy.

Second, the sample was predominantly composed of young adults aged 18–21, which may limit the generalisability of findings to older or more diverse populations. Additionally, reliance on self-reported data introduces the possibility of response bias, particularly regarding mental health status and chatbot usage frequency.

Finally, the study did not assess the specific types or functionalities of chatbots used, which could vary significantly in quality, therapeutic approach, and user experience. Future research should consider evaluating different chatbot models and integrating qualitative methods to capture deeper insights into user perceptions and engagement dynamics.

Implications

- **Enhance Chatbot Empathy:** Developers should prioritize the integration of emotionally intelligent and context-sensitive responses to foster greater user trust, engagement, and therapeutic effectiveness, particularly within the context of mental health support.
- **Prioritize Ethical Design Principles:** Chatbot development and implementation should adhere to stringent ethical standards, including transparency in data usage,

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robust privacy safeguards, and the incorporation of clearly defined ethical guidelines throughout the design and deployment process.

- **Expand Demographic Representation:** Future research should aim to include a more diverse range of participants, encompassing varying age groups, socioeconomic statuses, and clinical backgrounds, to improve the generalizability and applicability of findings.
- **Adopt Longitudinal Research Designs:** Long-term studies are essential to evaluate the sustained effects of chatbot interventions on mental health outcomes, enabling a more comprehensive understanding of their efficacy over time.

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Conflict of Interest

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