7.0 Mental Health Chatbots in Educational Settings: Do they Reduce Stress and Anxiety?

- **Neha Gautam**, Research Scholar, Department of Education, University of Lucknow, Lucknow- 226007, India
  Email ID: nehagtm829@gmail.com
- **Prof. Payal Gupta,** Professor, Department of B.Ed., Shri Jai Narain Misra P.G. (KKC) College, Lucknow
  Email ID- payal.jndc@gmail.com

Abstract

The rising incidence of mental health disorders among students has necessitated the use of digital therapies, such as mental health chatbots. These AI-powered solutions provide immediate, accessible, and stigma-free assistance, rendering them an appealing complement to conventional counseling services. This study explores the use of mental health chatbots as a tool to reduce stress and anxiety among students in schools and universities. With rising mental health issues and limited access to traditional counseling services, chatbots offer a new, accessible form of support. Using information from previously published studies and reviews, this research examines how effective these digital tools are in helping students manage their mental well-being. The results show that while many chatbots can provide short-term relief and help raise awareness about mental health, their success often depends on how they are designed and used. Some chatbots use proven methods like cognitive-behavioral therapy, while others focus more on general support and information. Although early findings are positive, more research is needed to understand their long-term impact and how to best use them in educational settings.

Keywords: *Anxiety, Stress, Mental Health Chatbots, Educational Settings*

Introduction

The prevalence of mental health problems, notably stress and anxiety, among students in educational settings is growing at an alarming rate. As a result of factors such as academic demands, social obstacles, and financial worries, there is an increasing demand for mental health help that is easily available. Even though they are helpful, traditional counseling programs sometimes have drawbacks such as lengthy wait periods, embarrassment and a lack of available resources. It is in this setting that chatbots for mental health have arisen as a solution that is both scalable and inventive, with the ability to deliver help that is rapid, confidential, and cost-effective. As a result of increased levels of stress and anxiety that have been documented throughout educational institutions, mental health issues among students have emerged as an urgent concern (World Health Organization [WHO], 2021). About sixty percent of college students suffer from excessive anxiety, and a significant number of these students do not have access to proper mental health support (American Psychological Association, 2020). Long wait times and limited access are common problems for traditional therapy services that are trying to keep up with the rising demand. The lack of mental health professionals has led to increased interest in digital solutions, especially mental health chatbots powered by AI, which can help students in trouble right away and easily.

Mental health chatbots use natural language processing (NLP) and machine learning algorithms to engage in conversations, provide cognitive behavioral therapy (CBT)-based techniques, and offer coping strategies (Fitzpatrick, Darcy, & Vierhile, 2017). These chatbots, such as Woebot and Wysa, aim to bridge the gap in mental health services by

providing 24/7 assistance, reducing stigma, and offering a confidential platform for students to express their concerns (Inkster et al., 2018). However, despite their potential, concerns regarding chatbot effectiveness, ethical implications, and their role in crisis situations remain underexplored (Torous et al., 2021).

This paper explores whether mental health chatbots effectively reduce stress and anxiety in educational settings by analyzing existing literature and case studies. It seeks to assess the benefits, limitations, and ethical considerations associated with chatbot-based mental health interventions in order to determine their viability as a supplementary tool in student mental health support systems. Traditional mental health support systems often struggle to meet the growing demand, leading to the emergence of digital solutions such as mental health chatbots. These AI-driven tools provide immediate support, psychoeducation, and cognitive behavioral therapy (CBT)-based interventions. This paper explores whether mental health chatbots effectively reduce stress and anxiety in educational settings, utilizing secondary data from existing research and case studies.

Review of related literature

Abd-alrazaq et al. (2020) conducted a comprehensive review on patient perceptions of mental health chatbots, which revealed generally positive attitudes regarding trustworthiness and usability. Cao et al. (2020) and Son et al. (2020) reported prevalent anxiety and stress among college students during the COVID-19 pandemic, underscoring the necessity for scalable mental health care. Racine et al. (2021) quantitatively assessed the global increase in juvenile anxiety and depression over this timeframe. Lee (2020) developed the Coronavirus Anxiety Scale, an instrument effective for assessing chatbot performance in stress evaluation. Khawaja and Bélisle-Pipon (2023) emphasized the ethical concerns and psychological misconceptions associated with AI mental health tools. Singh et al. (2023) confirmed the effectiveness of physical exercise in alleviating stress and anxiety, proposing that chatbot therapies may integrate motivational methods related to lifestyle enhancements. Wester et al. (2024) conducted an investigation on the perceived moral agency of mental health chatbots.

Research Objectives

This paper aims to investigate the effectiveness of mental health chatbots in reducing stress and anxiety among students in educational settings, using secondary data from existing studies, surveys, and case reports.

Research Questions

- How effective are mental health chatbots in reducing stress and anxiety among students?
- What are the key factors influencing the efficacy of chatbots in educational settings?
- What are the ethical and practical considerations associated with implementing chatbots in schools and universities?

Methodology

This research is based on a review of secondary data, including peer-reviewed journal articles, case studies, and reports. The initial search for literature was conducted using academic databases such as PubMed, ERIC, and Google Scholar, utilizing keywords including "mental health chatbots," "stress," "anxiety," and "educational settings." Inclusion criteria were established to filter studies that specifically address the efficacy, user engagement, and outcomes associated with mental health chatbots in educational contexts. The analysis focuses on identifying trends, outcomes, and gaps in the existing literature.

Findings

Effectiveness of Chatbots in Reducing Stress and Anxiety

The review of secondary data indicates that mental health chatbots show moderate effectiveness in reducing stress and anxiety among students in educational settings. Across several empirical studies, students who engaged with chatbot interventions, such as Woebot, Wysa, and Tess—reported statistically significant short-term reductions in self-reported stress and anxiety levels. These effects were particularly noted when chatbots incorporated evidence-based therapeutic approaches, such as Cognitive Behavioral Therapy (CBT), mindfulness exercises, and mood tracking. For instance, a randomized controlled trial using Woebot reported a meaningful decline in anxiety symptoms among college students over a two-week period. Similarly, studies on Wysa have shown that users experienced emotional relief and improved coping strategies after regular interaction over four to six weeks. Meta-analyses and systematic reviews also highlight that chatbots are generally well-received by students, with high usability scores and engagement rates.

However, the data also reflect variability in outcomes. The effectiveness of chatbots often depends on factors such as chatbot design (e.g., human-like interaction, personalization), duration of use, and user characteristics like age, gender, and prior mental health history. Importantly, most studies evaluated short-term effects, with limited evidence on long-term psychological outcomes. Ethical concerns, such as data privacy and crisis response capabilities, were also noted as critical limitations affecting user trust and sustained engagement.

Overall, the evidence supports the potential of mental health chatbots as supplementary tools for stress and anxiety management in educational contexts, although further longitudinal research is needed to confirm sustained effectiveness and safety.

Factors Influencing Efficacy

The analysis of secondary data reveals several key factors that significantly influence the efficacy of mental health chatbots in educational settings:

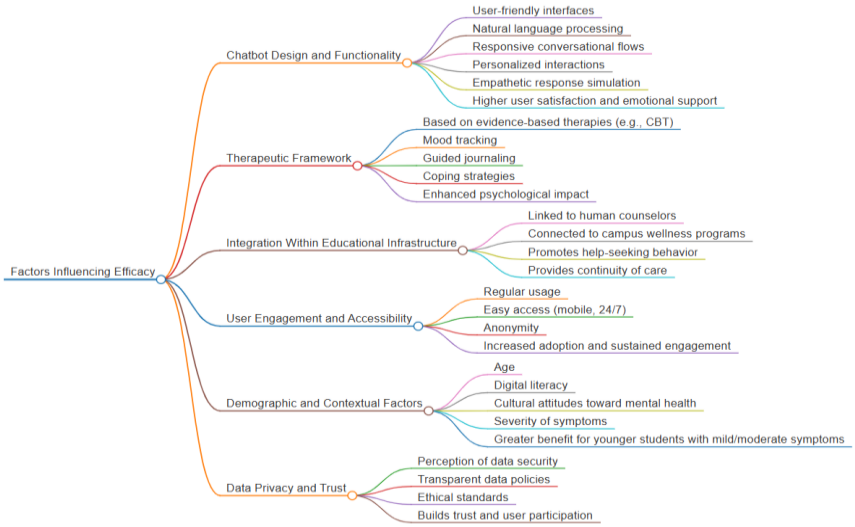

Figure 1: Factors influencing the efficacy of chatbots

- **Chatbot Design and Functionality**: Chatbots that incorporate user-friendly interfaces, natural language processing, and responsive conversational flows tend to

engage students more effectively. Personalized interactions and the ability to simulate empathetic responses contribute to higher user satisfaction and emotional support.

- **Therapeutic Framework**: Chatbots that are grounded in evidence-based psychological therapies, particularly cognitive-behavioral therapy (CBT), demonstrate higher efficacy in reducing stress and anxiety. The inclusion of structured therapeutic techniques, such as mood tracking, guided journaling, and coping strategies, enhances their psychological impact.
- **Integration Within Educational Infrastructure**: Chatbots that are integrated into the broader mental health services of schools or universities—such as being linked to human counselors or campus wellness programs—are more successful in encouraging help-seeking behaviors and providing continuity of care.
- **User Engagement and Accessibility**: Regular usage and ease of access are critical to the chatbot's effectiveness. Mobile availability, round-the-clock access, and anonymity contribute to increased adoption and sustained engagement, especially among students reluctant to seek face-to-face counseling.
- **Demographic and Contextual Factors**: Age, digital literacy, cultural attitudes towards mental health, and the severity of the user's symptoms play important roles in shaping the chatbot's impact. Younger students and those with mild to moderate symptoms tend to benefit more from chatbot interventions.
- **Data Privacy and Trust**: Students' willingness to engage with mental health chatbots is influenced by their perception of data privacy and security. Transparent data policies and clear ethical standards help build trust and increase user participation.

Ethical and Practical considerations associated with implementing chatbots

Ethical Considerations:

- **Data Privacy and Confidentiality:** One of the most frequently cited concerns is the protection of sensitive student data. Studies indicate that many chatbot applications lack transparent data handling practices, raising questions about consent, data storage, and third-party access.
- **Informed Consent:** Ensuring that students understand what data is collected and how it is used is a persistent challenge. Adolescents, in particular, may not fully grasp the implications of engaging with AI systems for mental health support.
- **Reliability and Misdiagnosis:** Chatbots, despite being programmed with therapeutic frameworks, are not substitutes for human clinicians. There is a risk of misinterpreting inputs or giving inappropriate advice, particularly in cases involving suicidal ideation or complex psychological disorders.
- **Equity and Access:** Ethical concerns also arise regarding equitable access, as students from under-resourced backgrounds may face digital divides, leading to uneven distribution of benefits.

Practical Considerations:

- **Integration with School Systems:** Implementing chatbots requires technical infrastructure and coordination with existing mental health services, which can be a barrier in schools with limited technological resources.
- **Training and Oversight:** Faculty and staff need training to understand the capabilities and limitations of chatbot systems. Without appropriate oversight, the tools may be used improperly or without sufficient follow-up.

- **User Engagement and Drop-off Rates:** While chatbots can increase access to mental health support, maintaining long-term student engagement remains a challenge. Studies have reported significant drop-off rates, suggesting that novelty alone is insufficient for sustained impact.
- **Evaluation and Regulation:** There is a lack of standardized evaluation protocols for measuring chatbot efficacy and safety in educational contexts, making it difficult to assess outcomes and ensure accountability.

Discussion

The findings suggest that mental health chatbots hold significant promise in addressing stress and anxiety among students. However, their effectiveness is contingent on thoughtful design, user-centered approaches, and integration with existing mental health services. Ethical considerations, such as data privacy and the potential for misuse, must also be carefully managed. Most existing studies assess short-term outcomes, leaving open questions about how these tools influence students' psychological well-being over extended periods.

Conclusion and recommendations

Conclusion

Mental health chatbots have emerged as a promising tool for addressing stress and anxiety among students in educational settings. These AI-powered conversational agents are designed to provide immediate support, coping strategies, and evidence-based interventions to students experiencing mental health challenges. The findings of the study indicate that mental health chatbots, such as Woebot, Wysa, and Tess, can effectively provide immediate relief and coping strategies to students. These chatbots have demonstrated statistically significant reductions in self-reported anxiety levels among users. Their effectiveness is particularly notable when employing evidence-based techniques like Cognitive Behavioral Therapy (CBT), which is widely recognized as an effective treatment for various mental health conditions. According to the study, students who used mental health chatbots consistently rated them highly for usability. Many participants described the tools as straightforward to navigate, accessible at any time, and well-suited to their personal needs. In addition to positive ratings, usage data showed strong patterns of engagement. Students were not just experimenting with the chatbots once or twice—they were returning to them regularly. This repeated use suggests the support being offered was genuinely valuable, a crucial element for any mental health intervention to succeed. The potential impact of such tools becomes even clearer when considered in the context of existing service gaps. Traditional mental health systems, while essential, often cannot meet demand. This shortfall is particularly noticeable in underserved communities. In these settings, high costs, a shortage of qualified professionals, and social stigma can all prevent people from seeking help. Chatbots have the ability to bypass many of these barriers. They can provide support anonymously, instantly, and at little to no cost, all through devices that students already carry with them. Unlike human-led services, which are limited by time and capacity, a single chatbot program can reach thousands of users simultaneously, regardless of location. Even so, the study cautions that simply launching a chatbot does not guarantee effectiveness. Several conditions influence whether these tools have a real impact. The quality of the chatbot's design, the relevance and accuracy of its content, and how well it integrates with existing institutional mental health services all play a role. Furthermore, students themselves differ—comfort with technology, familiarity with mental health concepts, and personal challenges can affect outcomes. Because of these differences, a standardized, one-size-fits-all approach is unlikely to work. Developers and institutions should adapt chatbot design and implementation to the specific needs, cultural backgrounds, and contexts of their target

student populations. Ethical considerations are equally important. Data privacy emerges as a significant concern, as chatbots inevitably gather sensitive personal information. Protecting this data is essential—not only to comply with legal requirements but also to build and maintain trust. Without clear safeguards, misuse or breaches could undermine the tool's credibility entirely. Positive feedback from students, reflected in high usability scores and strong engagement rates, highlights their potential to close gaps in mental health support, particularly for learners in underserved or resource-limited communities

Recommendations

For Educators and Educational Institutions:

- **Integrate Chatbots into Comprehensive Mental Health Programs:** Use chatbots as supplementary tools alongside existing counseling services, not as replacements for human support.
- **Ensure Accessibility and Inclusivity:** Provide access to chatbot tools across all student demographics, including those from under-resourced backgrounds, by addressing digital divide issues.
- **Promote Awareness and Digital Literacy:** Conduct workshops or orientation sessions to educate students and staff about how to use mental health chatbots safely and effectively.
- **Establish Clear Protocols for Escalation:** Ensure that chatbots are linked to human counselors or emergency services for crisis situations requiring professional intervention.

For Developers and Tech Providers:

- **Focus on Evidence-Based Design:** Incorporate psychological frameworks such as CBT, mindfulness, and mood tracking into chatbot functionalities for meaningful impact.
- **Prioritize User-Centered and Ethical Design:** Build empathetic interfaces, ensure user-friendly interactions, and integrate personalization features to maintain engagement.
- **Ensure Data Privacy and Transparency:** Implement clear data collection and storage policies, prioritize user confidentiality, and provide transparent terms of use.
- **Enable Feedback and Continuous Improvement:** Design systems that allow users to provide feedback and regularly update chatbot features based on user needs and evolving best practices.

For Researchers and Policymakers:

- **Conduct Longitudinal Studies**: Evaluate the long-term psychological impact and sustainability of chatbot interventions in educational settings.
- **Develop Standardized Evaluation Frameworks**: Create metrics and tools to assess chatbot safety, reliability, engagement, and therapeutic outcomes consistently.
- **Explore Cultural and Contextual Adaptations**: Study how local culture, language, and academic stressors influence chatbot effectiveness, and tailor content accordingly.
- **Advocate for Policy Support**: Support the inclusion of ethical AI guidelines in educational policy frameworks to ensure responsible and equitable deployment of digital mental health tools.

References

Abd-Alrazaq, A. A., Alajlani, M., Ali, N., Denecke, K., Bewick, B. M., & Househ, M. (2021). Perceptions and opinions of patients about mental health chatbots: scoping review. *Journal of medical Internet research*, *23*(1), e17828. doi:10.2196/17828

American Psychological Association. (2020). Stress in America 2020: A national mental health crisis.

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry research*, *287*, 112934. https://doi.org/10.1016/j.psychres.2020.112934

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child development*, *82*(1), 405-432. https://doi.org/10.1111/j.1467-8624.2010.01564.x

Fitzpatrick, K. K., Darcy, A., & Vierhile, M. (2017). Delivering cognitive behavior therapy to young adults with symptoms of depression and anxiety using a fully automated conversational agent (Woebot): a randomized controlled trial. *JMIR mental health*, *4*(2), e7785. doi:10.2196/mental.7785

Inkster, B., Sarda, S., & Subramanian, V. (2018). An empathy-driven, conversational artificial intelligence agent (Wysa) for digital mental well-being: real-world data evaluation mixed-methods study. *JMIR mHealth and uHealth*, *6*(11), e12106. doi:10.2196/12106

Khawaja, Z., & Bélisle-Pipon, J. C. (2023). Your robot therapist is not your therapist: understanding the role of AI-powered mental health chatbots. *Frontiers in Digital Health*, *5*, 1278186. https://doi.org/10.3389/fdgth.2023.1278186

Lee, S. A. (2020). Coronavirus Anxiety Scale: A brief mental health screener for COVID-19 related anxiety. *Death studies*, *44*(7), 393-401. https://doi.org/10.1080/07481187.2020.1748481

Li, G. (n.d.). *Markmap: Visualize your Markdown as mindmaps*. GitHub. https://markmap.js.org/

Park, J. I., Abbasian, M., Azimi, I., Bounds, D. T., Jun, A., Han, J., ... & Rahmani, A. M. (2024). Building trust in mental health chatbots: safety metrics and LLM-based evaluation tools. *arXiv preprint arXiv:2408.04650*. https://doi.org/10.48550/arXiv.2408.04650

Racine, N., McArthur, B. A., Cooke, J. E., Eirich, R., Zhu, J., & Madigan, S. (2021). Global prevalence of depressive and anxiety symptoms in children and adolescents during COVID-19: a meta-analysis. *JAMA pediatrics*, *175*(11), 1142-1150.

Singh, B., Olds, T., Curtis, R., Dumuid, D., Virgara, R., Watson, A., ... & Maher, C. (2023). Effectiveness of physical activity interventions for improving depression, anxiety and distress: an overview of systematic reviews. *British journal of sports medicine*, *57*(18), 1203-1209. https://doi.org/10.1136/bjsports-2022-106195

Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on college students' mental health in the United States: Interview survey study. *Journal of medical internet research*, *22*(9), e21279. doi:10.2196/21279

Torous, J., Bucci, S., Bell, I. H., Kessing, L. V., Faurholt-Jepsen, M., Whelan, P., ... & Firth, J. (2021). The growing field of digital psychiatry: current evidence and the future of apps, social media, chatbots, and virtual reality. *World Psychiatry*, *20*(3), 318-335. https://doi.org/10.1002/wps.20883

Wester, J., Pohl, H., Hosio, S., & van Berkel, N. (2024). " This Chatbot Would Never...": Perceived Moral Agency of Mental Health Chatbots. *Proceedings of the ACM on human-computer Interaction*, *8*(CSCW1), 1-28. https://doi.org/10.1145/3637410

World Health Organization, United Nations Educational, United Nations Educational, Scientific, & Cultural Organization. (2021). *Making every school a health-promoting school: Implementation guidance*. World Health Organization.

Yuan, A., Garcia Colato, E., Pescosolido, B., Song, H., & Samtani, S. (2025). Improving workplace well-being in modern organizations: A review of large language model-based mental health chatbots. *ACM Transactions on Management Information Systems*, *16*(1), 1-26. https://doi.org/10.1145/3701041