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Role of Artificial Intelligence in Advancing Mental Health Counselling: A Critical Review

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Abstract*: The integration of artificial intelligence (AI) into mental health counselling has emerged as a transformative solution to address the global mental health crisis, which affects over 970 million individuals worldwide. AI technologies, including chatbots, predictive models, and real-time emotion recognition systems, have demonstrated significant potential in enhancing access to care, personalizing interventions, and improving treatment outcomes. This study critically reviews the role of AI in mental health counselling, emphasizing its methodological implications, challenges, and ethical considerations. AI-powered tools like Woebot and Wysa effectively reduce symptoms of anxiety and depression, while predictive algorithms enable early identification of mental health risks. However, issues such as data privacy, algorithmic bias, and limited cultural inclusivity raise concerns about equitable implementation. In the African context, AI is beginning to address systemic barriers such as limited infrastructure and a shortage of mental health professionals, though challenges related to localized datasets and community engagement persist. This review highlights the need for culturally sensitive AI tools, transparent algorithms, and robust ethical frameworks to ensure responsible integration. By prioritizing these areas, future research can bridge existing gaps, paving the way for an accessible, personalized, and ethically sound mental health care system.*

Keywords: Artificial Intelligence, Mental Health Counselling

Introduction

Mental health disorders are a leading cause of disability worldwide, affecting an estimated 970 million people as of 2019, with depression and anxiety among the most prevalent conditions (GBD 2019 Mental Disorders Collaborators, 2022). Shisana et al., (2024) reported that mental health services remain underfunded, with less than 2% of national health budgets allocated to mental health in many low- and middle-income countries. Globally, over 75% of people with mental health conditions receive no treatment, a figure that rises to over 85% in low-resource regions such as Africa (Eaton, 2024). In sub-Saharan Africa, there is an acute shortage of mental health professionals, with an average of just one psychiatrist per 500,000 people, compared to 120 per 500,000 in high-income countries (Turissini et al., 2024). These disparities are exacerbated by cultural stigma, inadequate infrastructure, and poverty, leaving millions without access to adequate mental health care.

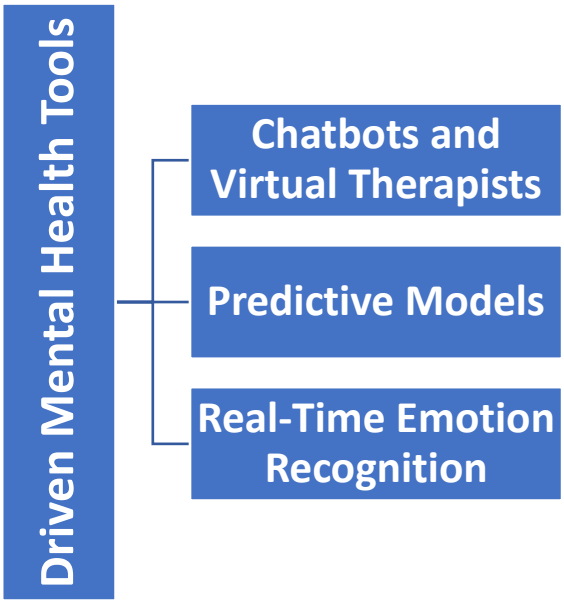
Amid these challenges, artificial intelligence (AI) presents a promising solution to expand access to mental health services, especially in resource-limited settings. By leveraging natural language processing (NLP), machine learning, and predictive analytics, AI offers scalable and cost-effective interventions that transcend geographical and economic barriers (Prabhakar et al., 2025). AI-powered chatbots such as Woebot and Wysa provide immediate psychological support, particularly in areas with limited access to mental health professionals (Asim et al., 2025). Additionally, AI algorithms can analyze large datasets to predict mental health risks and recommend early interventions, potentially reducing the burden of untreated conditions in underserved populations (Yasmeen et al., 2024). AI's potential to complement traditional therapy methods is another key advantage. By automating routine tasks such as symptom tracking and initial assessments, AI allows mental health professionals to focus on more complex therapeutic interventions, ultimately improving the quality of care (Nelson et al., 2025). Moreover, AI-driven tools can provide consistent and round-the-clock support, making mental health resources more accessible to individuals who may otherwise face barriers due to geographical or temporal constraints (Daisy, 2025).

From a global perspective, artificial intelligence (AI) has demonstrated immense potential in addressing mental health challenges. In high-income countries, AI-powered tools are being developed and implemented to bridge gaps in mental health service delivery. For instance, virtual agents such as Woebot and Wysa provide on-demand, evidence-based mental health support through natural language processing (Pavlopoulos et al., 2024). These AI-driven chatbots are designed to help individuals manage symptoms of anxiety and depression, offering scalable and cost-effective solutions that can supplement traditional therapy. Similarly, predictive models powered by machine learning algorithms have been utilized to identify individuals at risk of suicide or severe mental health crises, enabling early interventions and personalized care plans (Kannan et al., 2024). AI applications such as these have already demonstrated measurable success in improving mental health outcomes in populations where access to traditional services is readily available. Similarly, AI has been utilized to enhance diagnostic accuracy in mental health care. Algorithms trained on large datasets have been shown to detect subtle patterns in speech, facial expressions, and behavioural data that may indicate the presence of mental health disorders such as depression or schizophrenia (Bhatt et al., 2023). In Japan, for example, AI has been integrated into telemedicine platforms to monitor patients' mental well-being and provide recommendations to clinicians based on real-time data analysis (Tsvetanov, 2024). These innovations showcase the global strides being made in leveraging AI to address critical mental health issues, even as challenges such as ethical considerations, algorithmic bias, and data privacy remain pressing concerns.

In Africa, AI has already begun to show its potential, particularly in addressing the unique challenges of under-resourced mental health systems. Initiatives such as the use of AI for suicide risk prediction in Kenya demonstrate how technology can be tailored to local contexts to address pressing mental health needs. Kenyan researchers have utilized machine learning algorithms to analyze patterns in social media posts and other digital footprints to identify individuals at risk of suicide, providing opportunities for early intervention and potentially saving lives (Tariq, 2024). In Nigeria, AI-driven platforms for mental health education have been introduced to raise awareness about mental health conditions, reduce stigma, and improve help-seeking behaviours among the population (Ikpeama et al., 2025). These platforms employ natural language processing and machine learning to deliver culturally sensitive and context-specific content, ensuring their relevance and accessibility to diverse user groups.

While these innovations are still in their infancy, they offer hope for reducing the treatment gap and improving outcomes across the continent. Africa's integration of AI into mental health care highlights the potential of technology to overcome systemic barriers, such as a lack of trained professionals and limited infrastructure. At the same time, it underscores the importance of addressing contextual challenges, including the need for localized datasets, ethical frameworks, and community engagement, to ensure that these technologies are effective, equitable, and sustainable in the African context. Despite this promise, the adoption of AI in mental health counselling also raises critical questions about its ethical, methodological, and practical implications. Issues such as data privacy, algorithmic bias, and the potential depersonalization of therapy require careful consideration to prevent unintended consequences and to ensure that AI tools promote fairness and inclusivity (Saputra and Aminah, 2024).

This study critically examines the role of AI in mental health counselling, exploring its transformative potential while addressing the challenges and limitations associated with its implementation. By analyzing existing research and identifying gaps, this review provides a comprehensive perspective on the integration of AI into mental health care, offering insights that can inform future innovations and policies to maximize its benefits in diverse contexts.



AI-Driven Mental Health Tools

Chatbots and Virtual Therapists

AI-powered chatbots, such as Woebot and Wysa, have revolutionized mental health service delivery by engaging users in therapeutic conversations. These chatbots utilize natural language processing (NLP) to simulate human-like interactions and implement evidence-based techniques, such as cognitive-behavioural therapy (CBT), to address symptoms of anxiety and depression (Almira, 2025). Research has demonstrated their efficacy in reducing mental health symptoms, particularly among underserved populations who may face barriers to traditional therapy (Ramos and Chavira, 2022). Woebot has been shown to significantly reduce symptoms of anxiety and depression after just two weeks of use, making it a promising intervention for low-resource settings (Chipps, 2024). Furthermore, these tools are available 24/7, providing immediate support that is both scalable and cost-effective. This makes them especially valuable in regions where mental health professionals are scarce, as they can complement traditional therapeutic approaches by filling critical gaps in care.

Predictive Models

Predictive algorithms represent another transformative application of AI in mental health care. These models analyze user data such as social media activity, electronic health records (EHRs), and wearable device data to forecast mental health risks and identify individuals who may require early intervention. AI-based suicide prevention tools analyze language patterns, behavioural changes, and historical data to detect warning signs of suicidal ideation (Allam et al., 2025). A notable example is a study that used machine learning to analyze EHRs and predict suicide risk with a high degree of accuracy, enabling clinicians to target at-risk individuals for timely interventions (Atmakuru et al., 2024). Additionally, these predictive models have been integrated into social media platforms like Facebook, which uses AI algorithms to monitor posts and flag users at potential risk for suicide, thereby initiating immediate outreach and support (Forbeck, 2024). While these tools hold immense promise, their implementation also raises concerns about privacy, data security, and the potential for false positives, highlighting the need for robust ethical frameworks.

Real-Time Emotion Recognition

AI-powered emotion recognition systems are increasingly being utilized to enhance the personalization and effectiveness of mental health interventions. These systems analyze facial expressions, voice tone, speech patterns, and physiological data such as heart rate variability or skin conductance to assess clients' emotional states in real time (Lin and Li, 2023). For example, virtual therapy platforms have begun incorporating emotion recognition technologies to adapt therapeutic content dynamically based on the user's current emotional state, improving engagement and treatment outcomes (Olawade et al., 2024). Emotion AI technologies are also being applied in remote therapy contexts, allowing therapists to gain insights into clients' emotional well-being even during virtual sessions (Joshi and Jadeja, 2024). Additionally, wearable devices such as smartwatches equipped with emotion detection capabilities are being explored as tools to monitor emotional fluctuations and provide users with real-time feedback, helping them develop better emotional regulation skills (Dejene, 2025). Despite these advancements, challenges remain, including ensuring the accuracy of emotion recognition across diverse populations and addressing concerns about privacy and consent in data collection.

Methodological Implications

AI technologies are reshaping the landscape of mental health care by offering significant advancements in diagnosis, treatment planning, and intervention outcomes. Machine learning algorithms, for instance, have demonstrated superior performance compared to traditional diagnostic tools in identifying conditions such as depression, post-traumatic stress disorder (PTSD), and generalized anxiety disorder. By analyzing complex patterns in large datasets, these algorithms can detect subtle behavioural, linguistic, and physiological markers of mental health conditions that may go unnoticed by human practitioners (Karimian, 2025). A study by Mentis et al. (2024) found that machine learning models achieved higher accuracy than traditional assessments in diagnosing PTSD by analyzing speech patterns and physiological responses. These advancements not only improve diagnostic accuracy but also enable earlier detection and intervention, which are critical for successful treatment outcomes.

Another methodological strength of AI is its capacity to facilitate personalized treatment plans, which is a cornerstone of effective mental health care. AI systems can analyze diverse datasets, including clinical histories, genetic information, and real-time behavioural data, to develop tailored interventions that address the unique needs of individual clients. Research has shown that 68% of patients receiving AI-driven personalized recommendations for mental health care report higher treatment satisfaction compared to those receiving standard care (Olawade et al., 2024). AI-driven platforms such as IBM Watson Health utilize natural language processing (NLP) to extract insights from medical records and recommend evidence-based treatment options, enhancing decision-making for mental health professionals (Vuong, 2024). These systems not only assist in identifying optimal therapeutic approaches but also significantly reduce the time clinicians spend on administrative tasks, allowing more focus on direct client care.

Furthermore, adaptive AI systems are capable of monitoring clients' progress over time, dynamically adjusting therapeutic approaches based on real-time feedback and outcomes. For instance, studies have demonstrated that AI platforms utilizing machine learning algorithms can predict changes in symptom severity with up to 85% accuracy, enabling timely modifications to treatment plans (AbuAlrob and Mesraoua, 2024). This level of personalization represents a significant leap forward in the field of mental health care, where one-size-fits-all approaches often fail to address the complexity of individual experiences. Additionally, AI

technologies can identify patterns of treatment adherence and suggest interventions to improve compliance, a critical factor in achieving positive therapeutic outcomes. Despite these promising advancements, several methodological challenges persist, which limit the broader application of AI technologies in mental health. A significant issue is the reliance on small, homogeneous samples in many AI studies, which raises concerns about the generalizability of findings. 85% of publicly available mental health datasets used in AI research come from North America and Europe, reflecting populations from high-income countries and overlooking variations in cultural and socio-economic contexts (Khan et al., 2024). This creates a critical gap in addressing mental health needs in regions like Africa, where culturally specific factors, such as traditional beliefs and stigma, play a significant role in mental health outcomes (Mboweni et al., 2023).

The limited generalizability of AI findings is particularly problematic in Africa, where mental health conditions remain underdiagnosed and undertreated. The World Health Organization (WHO) estimates that in sub-Saharan Africa, the treatment gap for severe mental health disorders such as depression and schizophrenia exceed 90% (Eaton, 2024). This underscores the need for AI systems trained on datasets that reflect the unique stressors and coping mechanisms of African populations. Greater investment in the collection and curation of diverse, representative datasets that capture global variations in mental health presentations and risk factors is crucial to overcoming this limitation. In addition to data limitations, the "black box" nature of AI algorithms complicates their integration into clinical practice. Many AI systems operate with limited transparency, making it difficult for clinicians and researchers to understand how decisions are made. This lack of explainability erodes trust and raises ethical concerns, particularly in cases where AI-generated recommendations conflict with human judgment or lead to adverse outcomes (Puplampu, 2024). A survey of 500 clinicians found that 72% expressed concerns about the opacity of AI algorithms, with many stating they would hesitate to rely on such systems without clear insights into their decision-making processes (Olawade et al., 2025). To address these challenges, developers and researchers must prioritize the creation of interpretable AI models and invest in training clinicians to understand and effectively use these systems. Collaborative efforts between technologists, mental health professionals, and policymakers are essential to ensure that AI technologies are not only effective but also equitable and ethically sound.

Challenges and Ethical Considerations

1. *Data Privacy and Security*

The integration of AI into mental health care brings heightened concerns regarding data privacy and security. Mental health data is among the most sensitive forms of personal information, and breaches could lead to significant consequences, including stigma, discrimination, and emotional distress for affected individuals. AI applications in mental health counselling often collect vast amounts of personal data, ranging from text and voice inputs to physiological and behavioral metrics. Ensuring that these data are securely stored and processed is critical to maintaining client confidentiality. Compliance with international regulations such as the Health Insurance Portability and Accountability Act (HIPAA) in the United States and the General Data Protection Regulation (GDPR) in Europe provides a framework for safeguarding sensitive information. However, the global disparity in data protection laws poses challenges, particularly in regions with weaker regulatory frameworks (Bouraffa and Hui, 2025). Sub-Saharan Africa lacks comprehensive data protection policies, increasing the risks associated with the implementation of AI-driven mental health tools in these regions (Ogunwale et al., 2024).

To address these concerns, developers must adopt robust encryption technologies and ensure that AI systems incorporate privacy-by-design principles. Transparency in how data are collected, stored, and shared is also essential to building trust among users. Techniques such as federated learning which allows AI models to train on decentralized data without transferring it to central servers are emerging as promising solutions to enhance privacy and security in AI applications (Bharati et al., 2022).

2. *Equity and Accessibility*

AI systems are only as unbiased as the data on which they are trained. Unfortunately, many existing datasets used to train AI models are unrepresentative, often dominated by data from high-income, Western populations. This bias in training data can result in algorithms that fail to accurately serve underrepresented groups, exacerbating existing disparities in mental health care access and outcomes. Studies have shown that some emotion recognition algorithms perform poorly when analyzing facial expressions of individuals from non-Caucasian ethnic backgrounds due to the underrepresentation of these groups in training datasets (Mattioli and Cabitza, 2024).

In regions such as Africa, where cultural, linguistic, and socioeconomic factors significantly shape mental health experiences, the lack of localized data further compounds these inequities. AI tools developed in Western contexts may fail to account for cultural nuances, leading to inappropriate or ineffective interventions. Efforts to collect diverse, representative datasets are crucial to addressing these disparities. Initiatives such as the African Health Observatory's Digital Health Strategy aim to promote the inclusion of region-specific data in AI development (Akingbola, 2024). Furthermore, developers must actively incorporate fairness metrics into AI training and validation processes to identify and mitigate potential biases (Akinrinola et al., 2024).

3. *Therapist-Client Dynamics*

The introduction of AI into mental health counselling raises important questions about its impact on the therapist-client relationship. While AI-powered tools such as chatbots and virtual therapists can provide scalable and cost-effective interventions, they lack the empathy, intuition, and relational depth that are central to the therapeutic process. Human therapists bring a nuanced understanding of context and emotion, which AI systems cannot replicate. For instance, a study by Lakho et al. (2024) found that while users of AI chatbots appreciated the accessibility and convenience of these tools, they expressed skepticism about their ability to address complex emotional issues.

Maintaining a balance between automation and human interaction is crucial for ensuring that AI complements rather than replaces traditional therapy. AI can serve as a valuable adjunct to human therapists by automating routine tasks, such as appointment scheduling and symptom tracking, while leaving more complex aspects of care to trained professionals. For example, therapists could use AI-generated insights to inform their treatment approaches, thereby enhancing efficiency without compromising the therapeutic alliance. Additionally, incorporating ethical guidelines and training for therapists on how to integrate AI tools into their practice can help mitigate potential disruptions to the therapist-client dynamic (Guerrero, 2023

Bridging the Gaps

Artificial intelligence (AI) has the potential to revolutionize mental health counselling by expanding access to care, personalizing interventions, and improving treatment outcomes. The use of AI-powered chatbots, predictive models, and real-time emotion recognition systems offers innovative solutions to address mental health challenges, especially in underserved populations. AI tools like Woebot and Wysa have shown efficacy in reducing symptoms of anxiety and depression (Pavlopoulos et al., 2024), while predictive models have been employed for early identification of suicide risks (Pigoni et al., 2024). However, despite these promising developments, there remain significant gaps in knowledge and challenges that must be addressed to ensure the responsible and equitable integration of AI into mental health counselling.

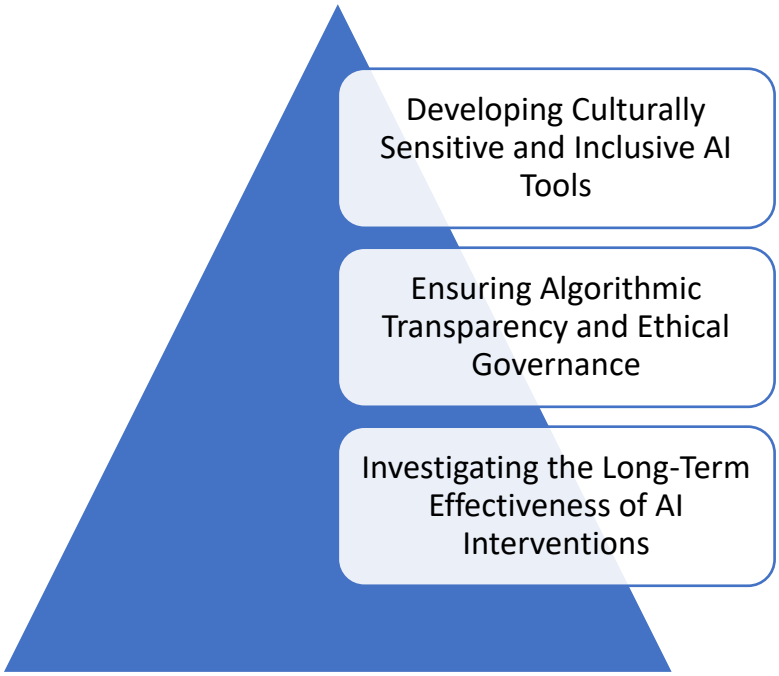


Fig. 2: Strategies to bridging the Gaps AI adoption in mental health in Africa

1. Developing Culturally Sensitive and Inclusive AI Tools

One critical area for future research is the development of culturally sensitive and inclusive AI tools. Current AI systems often rely on training datasets that are predominantly drawn from Western, high-income populations, which limits their applicability in diverse cultural and socio-economic contexts (Asiedu et al., 2023). Emotion recognition algorithms have been shown to perform poorly when analyzing facial expressions of individuals from non-Caucasian backgrounds due to a lack of diversity in the training data (Mattioli and Cabitza, 2024). This issue is particularly pressing in regions like Africa, where cultural factors significantly influence mental health presentations and coping mechanisms (Okasha et al., 2024). To address this gap, future research should focus on collecting and curating diverse, representative datasets that reflect the unique needs and experiences of various populations. Moreover, collaboration with local communities and mental health professionals can help ensure that AI tools are tailored to specific cultural contexts, enhancing their effectiveness and acceptability.

2. Ensuring Algorithmic Transparency and Ethical Governance

Another priority for future research is ensuring algorithmic transparency and establishing ethical governance frameworks. The "black box" nature of many AI systems makes it difficult for users and practitioners to understand how decisions are made, which can erode trust in AI tools and complicate their integration into clinical practice (Quinn et al., 2022). Transparent AI systems that allow for explainability and user interpretability are essential for fostering confidence among mental health professionals and clients. Additionally, ethical considerations such as data privacy, security, and the mitigation of algorithmic biases must be rigorously addressed. Compliance with international data protection regulations such as GDPR and HIPAA is crucial to safeguarding sensitive mental health information (Sargiotis, 2024). Future research should explore innovative approaches to enhance transparency, such as the use of interpretable machine learning models and federated learning techniques, which enable decentralized data processing while protecting user privacy (Ahmad et al., 2024).

3. Investigating the Long-Term Effectiveness of AI Interventions

While preliminary studies suggest that AI-driven mental health interventions can be effective, there is a need for more rigorous research to evaluate their long-term impact compared to traditional therapy methods. Most existing studies focus on short-term outcomes, leaving questions about the sustainability of AI-based interventions unanswered (Bragazzi et al., 2023). Longitudinal studies that examine the durability of treatment effects, user satisfaction, and the potential for over-reliance on AI tools are essential to understanding their broader implications. Additionally, research should explore the integration of AI with hybrid therapy models, where AI complements human therapists rather than replacing them. Such models could combine the scalability of AI with the relational depth and empathy provided by human counselors, offering a more holistic approach to mental health care (Jing, 2024).

Conclusion

By addressing these research priorities, the integration of AI into mental health counselling can be more effective, equitable, and sustainable. Developing culturally sensitive tools will ensure that AI technologies are inclusive and applicable across diverse populations. Enhancing algorithmic transparency and ethical governance will build trust and safeguard user rights, while rigorous evaluations of long-term effectiveness will provide the evidence base needed for informed decision-making. As AI continues to evolve, interdisciplinary collaborations among computer scientists, psychologists, ethicists, and policymakers will be essential to harness its full potential responsibly. In doing so, AI can pave the way for a more accessible, personalized, and effective mental health care system that addresses global mental health disparities and improves outcomes for individuals worldwide.

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