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AI CHATBOT FOR PERSONALIZED MENTAL HEALTH SUPPORT

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Abstract - This study presents an AI-driven chatbot designed to offer personalized mental health assistance through natural language processing (NLP) and machine learning (ML). The system assesses users' emotional states and provides tailored coping methods, mindfulness routines, and cognitive behavioural therapy (CBT)–based exercises. It continuously monitors mood trends to encourage proactive self-care. By delivering around-the-clock, judgment-free guidance, the chatbot reduces stigma and improves accessibility to psychological support. Its scalable and adaptive framework enhances inclusivity while complementing professional mental health care.

Keywords: Natural Language Processing (NLP), Emotional Support, Cognitive Behavioural Therapy (CBT), Mood Tracking, Anonymity, Scalability.

1. OVERVIEW

This AI-powered mental health chatbot is designed to provide personalized, scalable, and accessible support to users. By learning from individual interactions, it creates a safe, non-judgmental space for emotional expression while offering evidence-based techniques such as Cognitive Behavioural Therapy (CBT). Through continuous monitoring and feedback, the chatbot helps users identify patterns in their mental health, promoting early intervention and self-awareness. Available 24/7, it ensures support is always within reach, especially during crises or outside traditional therapy hours. While not a replacement for professional therapy, it serves as a complementary tool, enhancing access to mental health care regardless of location or financial barriers. This solution represents a meaningful advancement in integrating technology with mental health services.

2. LITRETURE SURVEY

S. No	Year	Title	Abstract	Methodology	Drawback
1.	2025	Lifeline Connect: A Web-based Multi-Feature System for Mental Health Support	Lifeline Connect is a 24/7 web application that supports mental health by combining mood tracking, relaxation techniques, an AI-driven chatbot, and anonymous peer communities. It delivers personalized guidance, fosters resilience, and creates a safe space for individuals to manage anxiety, stress, and depression, helping prevent suicide and self-harm	The methodology includes developing a web-based system that combines mood tracking, relaxation practices, AI chatbot support, and anonymous peer communities. AI analyzes user data to provide tailored recommendations. Ensuring privacy, scalability, and 24/7 access, the system promotes resilience, community engagement, and early intervention for preventing mental health crises.	Over-Reliance on Technology – Users may depend on the app instead of seeking professional help. Accuracy Limitations – AI may misinterpret emotional states, leading to inappropriate suggestions.
2.	2025	Elevate - An Intelligent	Elevate is an intelligent mental wellness companion offering mood tracking,	The system integrates AI-based mood analysis, guided coping strategies, and	Possible over-reliance on AI, data privacy risks, limited human involvement,

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		Companion for Mental Wellness	relaxation techniques, AI-driven guidance, and peer support. Accessible anytime, it provides personalized care, fosters resilience, and builds a safe community to help manage stress, anxiety, and depression, aiming to prevent crises like suicide and self-harm.	anonymous peer interactions within a secure web platform. Data-driven personalization ensures tailored recommendations, while 24/7 accessibility, privacy safeguards, and scalability support diverse users, fostering engagement, resilience, and timely interventions to strengthen mental well-being.	potential misinterpretation of emotions, and accessibility barriers for users lacking internet or digital literacy.
3	2024	AI based mental health assisted chatbot system	An AI-based mental health chatbot offers 24/7 emotional support, stress management, and early issue detection using NLP and machine learning. It ensures anonymity and affordability but faces challenges like limited empathy, privacy concerns, and handling severe cases. Ethical use and regulation are essential for safe, effective deployment in mental healthcare.[1]	This methodology focuses on collecting and preprocessing mental health data, integrating evidence-based therapies like CBT, ensuring user safety through escalation protocols, building NLP models for emotion and intent detection, designing an accessible interface.	AI chatbots face drawbacks including limited emotional understanding, privacy risks, and inability to replace therapists. Crisis management is limited, data quality affects outcomes.
4	2024	Mental health therapist chatbot using NLP	A mental health therapist chatbot using NLP provides conversational support, emotional guidance, and basic mental health assessments. Advantages include 24/7 access, anonymity, and cost-effectiveness. It's used for mood tracking, stress relief, and early intervention. [2].	The methodology involves collecting and preprocessing mental health data to train NLP models for intent and emotion recognition. It integrates evidence-based therapies like CBT and includes safety protocols for crisis detection and escalation.	AI chatbots may misinterpret complex emotions and lack genuine empathy, limiting their effectiveness. They cannot fully replace human therapists, especially in crisis situations.
5	2024	AI powered chatbot for mental health treatment	An AI-powered chatbot for mental health treatment uses artificial intelligence to deliver personalized support, therapy guidance, and mental health monitoring. Advantages include constant availability, scalability, and user anonymity. Applications range from anxiety and depression support to behavior tracking. [3].	The methodology involves preprocessing mental health data to train NLP models for emotion and intent recognition, integrating therapies like CBT, and implementing safety protocols for crisis detection.	AI chatbots lack deep empathy and may misinterpret emotions. They can't replace human therapists, especially in crises. Privacy risks and data quality issues affect effectiveness.

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6	2024	Conversational AI for Mental Health Support	Conversational AI for Mental Health Support provides real-time emotional assistance through AI-driven chat, mood tracking, and guided coping strategies. It fosters resilience, ensures 24/7 accessibility, and offers safe peer interaction, aiming to reduce stress, anxiety, and depression while preventing critical outcomes like self-harm and suicide.	The system employs natural language processing to understand user inputs, delivering personalized responses, relaxation guidance, and peer community engagement. User data is analyzed for early risk detection, ensuring secure, scalable, and continuous mental health support with privacy safeguards.	Risks include AI misinterpretation, privacy concerns, reduced human interaction, reliance on technology, and exclusion of digitally underserved users.
7	2024	MOODIFY: Tailored, personal and multifaceted AI assistant for young adult mental health issues	MOODIFY is a tailored, personal, and multifaceted AI assistant designed to support young adults facing mental health issues. It offers customized emotional support, mood tracking, and self-help tools. Advantages include personalization and accessibility. Applications involve stress, anxiety, and depression management. Challenges include privacy concerns, limited emotional depth, and ethical considerations. [4].	This approach starts with gathering and preparing mental health data relevant to young adults. Using NLP and machine learning, the AI understands user emotions, intentions, and context to deliver tailored support. It incorporates multiple therapeutic methods alongside crisis safety measures.	Limitations include difficulty in grasping nuanced emotions and an absence of true empathy, restricting effective support. The system cannot substitute professional therapy, particularly in emergencies.
8	2024	A mental health chatbot delivering cognitive behaviour therapy and remote health monitoring using NLP and AI	A mental health chatbot delivering Cognitive Behaviour Therapy (CBT) and remote health monitoring uses NLP and AI to offer structured therapy, emotional support, and real-time mental health tracking. Advantages include accessibility, scalability, and personalized care. Applications cover anxiety, depression, and stress. Challenges involve data privacy, accuracy, and handling severe conditions. [5].	The chatbot collects user data and applies NLP to understand emotions, thoughts, and behaviours. It delivers Cognitive Behavioural Therapy (CBT) exercises tailored to individual needs and uses AI to monitor mental health remotely through patterns and trends. Safety protocols detect crises, while continuous feedback improves personalization and effectiveness.	Challenges include limited emotional understanding and empathy, risking misinterpretation of user inputs. The chatbot cannot replace human therapists, especially in emergencies. Privacy concerns and data security are critical, and dependence on data quality may affect support accuracy.
9	2024	Conversational AI for Mental Health Support	Conversational AI for Mental Health Support provides real-time emotional assistance through AI-driven chat, mood tracking, and guided	The system employs natural language processing to understand user inputs, delivering personalized responses, relaxation guidance, and peer	Risks include AI misinterpretation, privacy concerns, reduced human interaction, reliance on technology, and exclusion of digitally underserved users.

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			coping strategies. It fosters resilience, ensures 24/7 accessibility, and offers safe peer interaction, aiming to reduce stress, anxiety, and depression while preventing critical outcomes like self-harm and suicide.	community engagement. User data is analyzed for early risk detection, ensuring secure, scalable, and continuous mental health support with privacy safeguards	
10	2024	Self-Heal: Conversational Therapy Bot with AI Enhanced Features for Mental Health	Self-Heal is an AI-powered conversational therapy bot designed to support mental health through real-time chat, mood tracking, relaxation guidance, and peer interaction. It provides personalized, accessible, and anonymous care, fostering resilience and preventing crises such as stress, anxiety, depression, and suicidal tendencies.	The system integrates conversational AI, natural language processing, mood analysis, and guided coping strategies. Anonymous peer communities and AI-driven personalization ensure timely intervention, privacy, and scalability,.	Potential AI misinterpretation, over-reliance on technology, privacy and data security risks, limited human empathy, and barriers for users lacking internet access or digital literacy.
11	2024	MindLift – A Conversational AI Chatbot for Enhancing Mental Health	Mental health challenges such as stress, anxiety, depression, and sleep disorders have become increasingly common in today's fast-paced world. The COVID-19 pandemic further emphasized the importance of accessible psychological support systems. MindLift, a virtual mental health assistant, has been developed using natural language processing and the RASA framework to provide personalized, on-demand guidance. Although the chatbot does not perform emotion recognition, it supports individuals in managing negative thoughts and emotional struggles, offering a private and scalable alternative for those reluctant to seek in-person help.	The chatbot uses the RASA framework to process natural language inputs, classify user intent, and generate relevant guidance. Data related to common mental health concerns was collected and preprocessed to train the system in handling diverse conversational scenarios. While the chatbot lacks emotion detection, it applies contextual analysis to provide supportive responses, thereby offering users guidance that aligns with their expressed needs.	The key advantages of MindLift include its round-the-clock availability, ease of access, and cost-effectiveness. It provides a safe and private environment for individuals to express concerns without fear of stigma. Personalization enhances the relevance of responses, while the use of NLP makes communication more interactive and human-like.
12	2024	A Comprehensive Approach for Detecting Mental Instabilities using Sentiment Analysis and Machine Learning	With the rise of mental health challenges in recent years, there is a growing need for reliable monitoring and intervention mechanisms. This study introduces a text-driven	Preprocessing of textual data (cleaning, tokenization, normalization). Extraction of sentiment values and engineered features. Training machine learning models for classification tasks.	Restricted to text inputs, excluding voice, facial cues, and contextual signals. Struggles with sarcasm, ambiguous expressions, or complex linguistic patterns. Ineffective in handling crisis

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			detection framework that leverages sentiment analysis and machine learning to evaluate an individual's psychological state. The system processes user input through text preprocessing, extracts sentiment indicators and key features, and applies machine learning models for classification.	Evaluating performance using standard metrics (achieving 82.31% accuracy). Delivering personalized suggestions based on the predicted sentiment.	or severe mental health conditions.
13	2024	REDE-Detection human emotions using CNN and RASAs	REDE detects human emotions using Convolutional Neural Networks (CNN) and RASA's NLP framework to enhance emotional understanding in AI systems. It enables accurate emotion recognition from text and facial data. Advantages include improved user interaction and real-time analysis. [6].	Data from facial expressions, speech, and physiological signals is collected and pre processed. CNNs extract deep features from these inputs, while RASA mechanisms capture temporal and contextual information.	The model requires extensive, accurately labelled data, which is often hard to collect. Noisy or varied inputs may lower accuracy..
14	2023	AI and chatbots in psychiatry	AI and chatbots in psychiatry enhance mental healthcare by providing automated support, early diagnosis, and continuous patient monitoring. They offer 24/7 accessibility, anonymity, and scalable therapy options. Applications include mood tracking, CBT delivery, and crisis intervention. [7].	AI-driven chatbots in psychiatry collect patient data through conversations, using NLP to understand symptoms and emotions. Machine learning models analyse this data to offer personalized mental health support.	Limitations include insufficient empathy and understanding of complex psychiatric conditions.
15	2023	A mental health chatbot with cognitive skills for personalized behavioural activation and remote health monitoring	A mental health chatbot with cognitive skills offers personalized behavioural activation and remote health monitoring using AI. It adapts to individual needs, promotes positive habits, and tracks mental health remotely. Advantages include personalization and real-time support. Applications include depression management and therapy assistance. [8].	The chatbot uses NLP and AI to assess user mood and behaviour, delivering personalized behavioural activation strategies to encourage positive habits.	Challenges include limited emotional understanding and empathy, reducing depth of support. The chatbot cannot replace human therapists, especially during emergencies.
16	2023	MediBot: Healthcare Assistant on Mental Health and Well Being	The paper proposes a chatbot that helps individuals with mental health challenges by offering personalized guidance through artificial	**:** The system was developed by first gathering mental health information from trusted sources and then preprocessing it for model training. A chatbot	Its effectiveness is also limited by the scope and accuracy of its training data, as poor-quality data can lead to misleading or incomplete responses.

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			intelligence and natural language processing. The system is designed with a simple interface for easy interaction and delivers reliable information on mental health topics. By combining personalization and intelligent dialogue, the chatbot serves as a supportive tool for early intervention and general well-being.	framework was designed to integrate AI and NLP algorithms, allowing the chatbot to communicate naturally with users and deliver meaningful responses. Personalization features were added so that the chatbot could provide tailored guidance based on individual needs, while a structured knowledge .	
17	2023	MediBot: Healthcare Assistant on Mental Health and Well Being	The paper proposes a chatbot that helps individuals with mental health challenges by offering personalized guidance through artificial intelligence and natural language processing. The system is designed with a simple interface for easy interaction and delivers reliable information on mental health topics. By combining personalization and intelligent dialogue, the chatbot serves as a supportive tool for early intervention and general well-being.	The system was developed by first gathering mental health information from trusted sources and then preprocessing it for model training. A chatbot framework was designed to integrate AI and NLP algorithms, allowing the chatbot to communicate naturally with users and deliver meaningful responses.	Its effectiveness is also limited by the scope and accuracy of its training data, as poor-quality data can lead to misleading or incomplete responses.
18	2023	AI chatbot in digital mental health interventions	AI chatbots in digital mental health deliver automated, accessible emotional support through AI and NLP technologies. They offer personalized therapy, mood monitoring, and emergency help. Benefits include constant availability and scalability. They are used for managing anxiety, depression, and stress. Challenges include privacy concerns, limited empathy, and addressing serious conditions.[9].	The AI chatbot engages users through text-based interactions, using NLP to detect emotional states and mental health needs. It delivers digital interventions such as CBT techniques, mindfulness prompts, and behavioural suggestions tailored to individual responses. Continuous learning from user interactions improves intervention accuracy and remote monitoring capabilities.	AI chatbots may lack empathy and misinterpret complex emotions. They are not suitable for handling severe mental health crises and cannot replace clinical judgment. Data privacy, user trust, and dependence on high-quality training data remain major concerns, potentially affecting effectiveness and user engagement.
19	2023	Towards effective IT services in defence talent management platform	Developing effective IT services for a defence talent management platform improves recruitment, training, and workforce development through advanced technology. It	The platform leverages IT services, including AI, data analytics, and cloud computing, to streamline talent acquisition, assessment, deployment, and	Challenges include data security risks, especially with sensitive defence information.

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			boosts efficiency, transparency, and informed decision-making. Key applications include performance evaluation and career planning. [10].	career progression in defence.	
20	2023	AI-powered mental health chatbots: Examining users' motivations, active communicative action and engagement after mass-shooting disasters	AI-powered mental health chatbots provide immediate emotional support and encourage active communication following mass-shooting tragedies. They assist users in coping with trauma, managing stress, and maintaining engagement. Benefits include on-demand access and user privacy[11].	This approach uses AI-powered chatbots to support users after mass-shooting events. Natural Language Processing (NLP) analyses user inputs to detect emotional states, motivations, and behavioural patterns.	AI chatbots may lack the emotional depth needed during severe trauma. Misinterpretation of distress signals and inability to offer real-time.
21	2022	Mental health monitoring system using AI:A review	AI-based mental health monitoring systems utilize machine learning and data analysis to evaluate, track, and predict mental health states. They support early intervention, continuous assessment, and personalized care. Key benefits include scalability and precision. Applications include mood analysis and risk detection. Challenges include privacy concerns, data bias, and emotional complexity [12].	AI-based mental health monitoring systems collect and analyze user data such as text, voice, facial expressions, and physiological signals. Techniques like Natural Language Processing (NLP), machine learning, and emotion recognition are applied to detect mood patterns, stress levels, and behavioral changes.	Limitations include privacy risks due to sensitive data collection, possible misinterpretation of emotional states, and lack of contextual understanding.
22	2022	Chatbot and conversational agents in mental health: A review of the psychiatric landscape	Chatbots and conversational agents are reshaping mental healthcare by providing AI-driven, on-demand support within the psychiatric field. They aid in therapy delivery, mental health monitoring, and emotional assistance. Benefits include round-the-clock availability and broad reach. Applications span anxiety, depression, and stress. Challenges include empathy gaps, privacy risks, and clinical reliability. [13].	This review explores how chatbots and conversational agents are being integrated into psychiatric care. It examines systems powered by AI and NLP that deliver interventions like Cognitive Behavioral Therapy (CBT), mood tracking, and psychoeducation.	Key limitations include reduced empathy compared to human therapists, risks of emotional misinterpretation, and lack of effectiveness in severe psychiatric cases.
23	2021	A chatbot for psychiatric counselling in mental healthcare	A psychiatric counseling chatbot uses emotional dialogue analysis and sentence generation to offer	The chatbot uses emotional dialogue analysis to interpret user sentiment and mental state in real time. NLP	Despite advanced dialogue generation, the chatbot may misread emotional nuances or produce inappropriate

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		services based on emotional dialogue analysis and sentence generation	tailored mental health support. It provides empathetic interactions to help users express emotions and receive guidance. Advantages include immediate availability and scalability. It's used for therapy support and emotional evaluation. [14].	techniques and sentiment classification models assess emotional cues, while AI-driven sentence generation creates context-aware, empathetic responses.	responses. It lacks deep empathy and clinical judgment.
24	2020	A Chatbot-based Mobile Application to Predict and Early-prevent Human Mental Illness	The paper outlines the design of a chatbot mobile application for human mental health, which can determine whether an individual has a mental illness and suggest prevention methods by using machine learning algorithms. There are some popular mental counseling applications in the markets, most of which are based on one mental survey or examination. We noticed that this can be done in a more natural/intelligent way - texting, talking or even videoing.	The methodology involved designing a mobile chatbot that assesses mental health using machine learning algorithms. It integrates natural language processing (NLP) for text, speech, and video interactions, along with continuous emotion dialogue analysis. The system generates context-aware responses via sentence and audio synthesis, providing personalized prevention suggestions to users.	The drawbacks of this chatbot-based mental health application include dependency on accurate emotion detection, which may be affected by noisy input or misinterpretation. High computational requirements for real-time NLP and audio/video processing may limit scalability.
25.	2019	A Deep Learning Based Chatbot for Campus Psychological Therapy	In this paper, we propose Evebot, an innovative, sequence to sequence (Seq2seq) based, fully generative conversational system for the diagnosis of negative emotions and prevention of depression through positively suggestive responses. The system consists of an assembly of deep-learning based models, including Bi-LSTM based model for detecting negative emotions of users and obtaining psychological counselling related corpus for training the chatbot, anti-language sequence to sequence neural network, and maximum mutual information (MMI) model. As adolescents are reluctant to show their negative emotions in physical interaction, traditional methods of emotion analysis and	Evebot uses a Bi-LSTM model to detect negative emotions, supported by a counseling-specific corpus for empathetic training. A Seq2Seq framework with anti-language filtering and MMI ensures diverse, positive responses.	it lacks human empathy, limiting emotional support; may inherit biases from training data, affecting response accuracy; can foster over-reliance, delaying professional help; and poses data privacy risks, as sensitive mental health information could be exposed without adequate protection measures.

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			comforting methods may not work.		
26	2019	Chatbots and Conversational Agents in Mental Health: A Review of the Psychiatric Landscape	This review explores the role of chatbots and conversational agents in psychiatry, examining applications in screening, therapy, diagnosis, and monitoring. Covering depression, anxiety, PTSD, and schizophrenia, it highlights benefits, limitations, safety concerns, and research gaps, offering insights into opportunities and challenges of integrating conversational agents into mental health care.	a systematic literature search conducted in June 2018 across multiple databases, including PubMed, EmBase, PsycINFO, Cochrane, Web of Science, and IEEE Xplore. Studies were selected if they involved chatbots in mental health settings, focusing on populations with or at high risk of developing depression, anxiety, schizophrenia, bipolar disorder, or substance abuse disorders.	highlights several drawbacks. Chatbots lack human empathy, struggle with crisis situations, and may inherit biases from training data. Data privacy concerns and absence of standardized regulations further limit their safe and effective deployment in mental health care.
27	2018	EMMA: An Emotion-Aware Wellbeing Chatbot	The delivery of mental health interventions via ubiquitous devices has shown much promise. A conversational chatbot is a promising oracle for delivering appropriate just-in-time interventions. However, designing emotionally-aware agents, specially in this context, is under-explored. Furthermore, the feasibility of automating the delivery of just-in-time mHealth interventions via such an agent has not been fully studied. In this paper, we present the design and evaluation of EMMA (EMotion-Aware mHealth Agent) through a two-week long human-subject experiment with N=39 participants.	The methodology of the EMMA study involved designing an emotion-aware chatbot that delivered empathetic micro-activities. A two-week human-subject experiment with 39 participants was conducted.	The drawbacks of EMMA include its reliance on smartphone sensors, which may not always capture accurate emotional states, and the small sample size of 39 participants limiting generalizability.

3. CONCLUSION

AI chatbots are revolutionizing mental health support by providing personalized, evidence-based assistance available 24/7. Using proven methods like Cognitive Behavioral Therapy (CBT), they tailor guidance to individual needs, helping users manage a variety of mental health challenges. In addition to immediate support, these chatbots offer self-help resources, behavior tracking, and reminders to encourage healthy habits. Although they do not replace traditional therapy, AI chatbots serve as a valuable first step, particularly for those in underserved areas with limited access to professional care. Their affordability, scalability, and privacy make them accessible to many who might face barriers to mental health services. Overall, AI chatbots play a crucial role in expanding access, promoting early intervention, and supporting emotional well-being in a cost-effective and user-friendly manner.

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