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REVIEW ARTICLE

A Systematic Comprehensive Review of Artificial Intelligence Powered Text-Based Applications for Mental Healthcare

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ABSTRACT

Mental health condition is a global issue, and these mental health disorders can result in reduced efficiency and productivity in the workplace. Thus, the need for innovative and successful solutions is growing as societies continue to identify the significance of mental health. Incorporating artificial intelligence into mental health care is a promising strategy for its transformation. The data is collected from secondary sources comprising app store descriptions. The apps analyzed in the article are available on Google Play and Apple App Store. The apps are downloaded, reviewed, and rated by various users. The data is collected from the app stores and analyzed based on these downloads, reviews, and ratings. The diversified text-based mobile applications powered by the latest AI technology can analyze huge amounts of data, such as users' emotions, sentiments, and behavioral patterns, to provide them with tailored treatment, online counseling, and monitoring. All the applications are found to be useful in addressing mental health issues and are on the rise in usage to resolve such issues. To address mental well-being challenges, AI has evolved as a trailblazing force. It uses cutting-edge machine learning computational algorithms to develop novel approaches, improve the diagnosis process, select treatments, and enhance well-being. The use of chatbots in handling individuals facing mental health issues is still in its infancy. The future of AI in mental health care applications is very promising due to the increase in usage of the latest technologies to address problems related to mental health.

1. INTRODUCTION

As a constantly progressing technology, Artificial Intelligence (AI) has transformed various aspects of people's lives, including education, transport, healthcare, and many more [1]. AI can be utilized regularly to search for information, look for health resources, and gain social assistance in mental health [2]. Using mobile platforms to provide services helps improve mental health and enhance well-being. It is turning into a reasonable method that narrows the gap between mental and different sorts of health care [3]. The efficacy and accessibility of mental health support have been significantly boosted by technological improvements in the development of AI-based mental health apps. Using digital platforms to link people with essential resources and help, these apps successfully remove conventional difficulties to care and offer on-demand treatment to a broader population. In this situation, AI could act as a transformative therapeutic tool. There are many discoveries, like artificial intelligence (AI) and its subfields like machine learning (ML) and deep learning (DL), which could help find solutions to problems with mental health care [4]. Analysts have found advantages of ML in identifying and diagnosing psychological wellness problems like wretchedness, Alzheimer's illness, and schizophrenia, as well as in the improvement of clinical and research cycles to advance emotional wellness and prosperity [5]. Mental health conditions are a global problem, and it is anticipated that they will continue to increase. The World Health Organization (WHO) estimates that about one in eight people on the globe suffer from a mental disorder, which is approximately 970 million people. The two most widespread mental health disorders remain depression and anxiety. Mental health disorders can result in diminished productivity in the workplace [6]. Depression and anxiety are analysed to lead to a global loss of about $1 trillion in productivity annually. The need for mental health services is growing, and more people are being impacted [7]. Globally, every year, about 14.3% of people die due to mental health disorders [8]. Despite the rising predominance of emotional well-being issues, many individuals face significant obstructions in getting assistance to overcome

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these issues. Many people who have mental illness are not able to receive treatment even though it is available. Plenty of individuals fail to get the assistance they require because of barriers like stigma, having access to treatment, and medical disparities. Mental health apps, which offer readily accessible tools for managing one's emotions, skill training, and assistance, may be helpful for individuals with mental health conditions who face challenges such as stigma, a lack of resources, or geographic restrictions to seeking publicly available treatment. Chatbots help in assisting such people. Chatbots are software programs that assist in simulating conversations with users using either text or voice. Additionally, chatbots may offer anonymity, which is frequently lacking in conventional mental health services. People who are hesitant to talk about their mental health issues with other people can talk about their feelings and get assistance from chatbots without worrying about being judged [9]. An AI chatbot can help individuals by monitoring their mood and tracking their mental health progress. These virtual assistants can provide individuals needing customized support and direction by utilizing AI and ML. These are available 24/7 and can be accessed anytime and anywhere, making them an essential asset for individuals who cannot utilize conventional services. These encourage people to get involved in various activities that help in improving their mental well-being. By assessing interactions with users and detecting patterns in language, sentiment, and symptoms mentioned, AI chatbots employ machine learning techniques to deliver personalized treatment. This allows the chatbot to customize answers, suggest appropriate workouts, and monitor development as time passes. Chatbots provide individualized therapies by adjusting to each individual's particular requirements and preferences, offering a degree of guidance and aid that is generally incomparable to conventional mental health facilities. The AI revolution in providing mental health services is bright, promising, and inexorable. Human expertise can be enhanced, and a holistic approach can be boosted to provide mental health treatment by incorporating AI into mental health services. AI plays a vital role in facilitating the curative journey of patients by assisting them at different phases of the procedure. At the centre lies AI's capability to offer customized aid to every client by tracking down the right specialist for practical cooperation from the outset. While searching for assistance, AI could help understand clients' requirements better by dynamically changing the successive queries based on their reactions, assisting them with finding the right sort of emotional wellness support [10]. The main focus of this study is to review the various AI-powered text-based apps developed to provide virtual health assistance.

2. LITERATURE REVIEW

There are a lot of mental health text-based conversational apps driven by AI that can be accessed through smartphones and are available on both Google Play Store and Apple App Store. These apps include Wysa, Woebot, Jumping Minds, and Being, Calm, Headspace and many more. These mental health apps utilize AI-powered chatbots and other technologies, including CBT, that help users handle mental well-being issues. The authors in this article have reviewed some of the popular applications currently accessible and being utilized. Table 1 represents the review of mental health apps by different authors.

3. MARKET SIZE OF AI IN MENTAL HEALTH CARE

Applications available for mental health and wellness are AI-powered tools that can be accessed through smartphones and other mobile devices and are focused on improving and solving a variety of issues related to mental health and guaranteeing mental well-being [15]. As per the report of Future Data Stats, the market size of AI in Mental Health care was globally found to be 1.28 billion USD in 2022, and this value is expected to rise at a CAGR (Compound Annual Growth Rate) of 36.9% to about 12.23 billion USD by 2030 [16]. It is shown in Figure 1.

According to the report by Verified Market Research, the global Healthcare Chatbots market is expected to expand at a CAGR of 19.16% from 2022 to 2030. The market size was esteemed at USD 194.85 Million in 2021 and is forecasted to reach USD 943.64 Million by 2030 [17]. It is shown in Figure 2.

The market is witnessing consistent growth in the use of AI to improve mental health care. This growth is driven by the rise in the adoption of advanced digital technologies in healthcare services, the impact of the coronavirus pandemic, rising awareness related to chronic diseases, the evolution of NLP, and increasing

Table 1 | Literature review

Objective	Findings
The study's objective was to explore the effectiveness of AI-powered mental health applications in countries where people have limited access to resources in terms of income using the AAAQ (Availability, Accessibility, Acceptability, and Quality) framework [11].	It was concluded that mental health applications offer immediate help, which is of specific significance to its pertinence to low and middle-income countries. It was also highlighted that app developers need to take into consideration factors such as availability, accessibility, acceptability, and quality to make sure that people in LMICs can use these apps.
To test the clinical viability and nonclinical execution of a CBT (Cognitive Behavioral Therapy)-based Mental Health Chatbot, XiaoE for young people suffering from depression [12].	It was found that using a CBT-based chatbot is an engaging approach to providing self-guided assistance to adults.
The study aimed to determine and understand the security and privacy of data in text-based mental health applications [13].	The authors found a high predominance of threats related to disclosure of information due to insecure programming.
To determine the viability of a CBT-based text messaging app, Text4Hope, in reducing tension, stress, and depression among females during the coronavirus pandemic [14].	Text4Hope, a CBT-based text messaging application, was found to be effective in enhancing women's mental health outcomes during the COVID-19 pandemic. It was concluded that Text4Hope could address the remarkable difficulties and variations in women's psychological wellness by giving emotional wellness support.

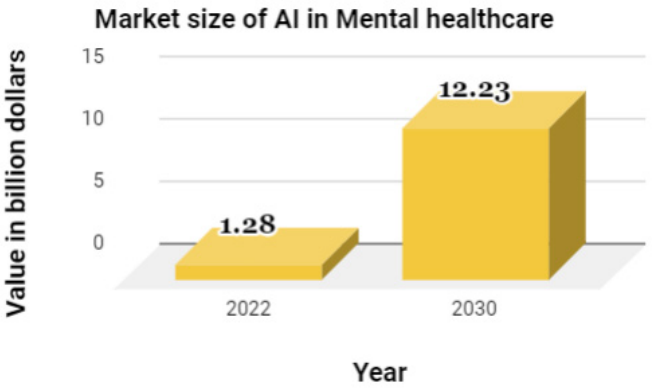

Figure 1 | Market size of AI in mental healthcare.

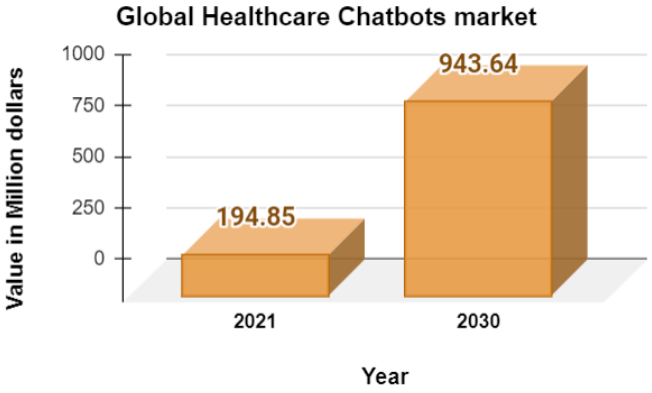

Figure 2 | Market size of global Healthcare Chatbots.

demand for all-time access to healthcare services. AI-powered chatbots or virtual assistants offer 24*7 support, permitting individuals to seek assistance at their convenience.

4. TEXT-BASED AI APPS FOR MENTAL HEALTH CARE

AI has become a glimmer of hope for people looking for comprehensive and customized services due to its ability to aggrandize diagnosis, select treatment, and provide assistance. AI in mental health aids healthcare professionals and users in gaining valuable insights and better managing mental health conditions. There are several text-based AI apps available for providing mental health assistance to individuals, and some of them are discussed below:

4.1. Woebot

AI has become a useful tool for predicting and detecting mental health conditions. AI-powered chatbots help people by providing mental healthcare support. Woebot, a therapy bot to overcome depression, was founded by Dr. Alison Darcy in 2017. Woebot is a platform that utilizes an AI-powered 'chatbot' to help clients with their emotional well-being issues. This chatbot works on the principle of Cognitive Behavioral Therapy (CBT). It helps users handle stressful thoughts and feelings. It uses talk therapy to help users monitor their moods and discover themselves. The bot asks users about their feelings and daily life in brief conversations of 10 minutes. It utilizes a fusion of natural language processing, well-constructed writing, a sense of humor, and cognitive expertise [18]. It then stores all text and emoticons, and its inquiries and reactions become more particular over time, referring to past discussions. The bot tends to emotional well-being and health by observing its client's temperament and needs and curating video recordings and other tools over the chat when required.

4.2. Wysa

Chatbots powered by AI remove the constraints of conventional therapy schedules and offer continuous access to mental health assistance. The intelligent chatbot uses AI to respond to customers' emotions. Wysa was created by Jo Aggarwal in 2016. The App's and the company's objective is to make psychological health care available and reachable to all people and diminish the disgrace around seeking help and assistance. Wysa is a user-friendly, AI chatbot-directed cognitive behavioral therapy (CBT) application that recommends meditation, yoga, and other exercises. Wysa training comprises 30 minutes, live text sessions with a psychological health coach, and admittance to everything in the premium application. This application provides individual coaching sessions for $19.99, or users can sign up for a monthly subscription for $79.99. This chatbot utilizes techniques such as CBT (Cognitive Behavioral Therapy), DBT (Dialectical Behavioral Therapy), and the practice of meditation to assist users in fighting against depression, anxiety, stress, trouble sleeping, and other issues related to mental well-being. Talking to the chatbot is very helpful, and it makes no judgments. The user's identity is kept anonymous, and conversations are also protected. The chatbot is named "AI Penguin," it listens to the user and replies accordingly.

4.3. Youper

Mental health apps integrate psychology and artificial intelligence to comprehend clients' emotional needs and engage in natural conversations. Youper was founded by Dr. Jose Hamilton, Diego Couto, and Thiago Marafon in 2016. This App utilizes AI technology to assist users in handling their mental stress. A chatbot is provided that tracks and improves the mood, feelings, and sleeping patterns, reduces symptoms of anxiety and depression, and conducts routine check-ins by using CBT and ACT (Acceptance and Commitment Therapy). This app is free for the first seven days and must be subscribed to for $69.99 annually. It comprises four features - AI-Chatbot, Mood records, Journal logs, and Emotional Assessment of Health. The Chatbot asks the users about their feelings and asks them to tell the reasons or factors contributing to their current state of mind. After that, the chatbot provides suggestions involving activities to improve the rest of the user's day. The Journal log contains all the responses the user gave for the "How are you feeling?" prompt. The Mood log gathers responses of users to "What made you feel this way?" prompts. All these prompts are given to the user by the Chatbot.

4.4. Evolve

People experiencing mental health problems can benefit from AI-powered mental health applications. Evolve mental health app was created by Anshul Kamath in 2020. It provides

a meditation and mental fitness program that can assist users in sleeping, calming, or becoming more mindful. It is a mental well-being AI technology-driven startup that aims to build a virtual and safe space for people to handle their issues related to mental well-being. Through interactive content based on Cognitive Behavioural Therapy (CBT), its proprietary interface assists users in improving their mental well-being. The developer of the application has moved its concentration towards people belonging to the LGBTQ+ group. Evolve provides a thriving section that users can use to discuss and share their experiences with others to overcome stress [19]. As per the application creators, Evolve can assist clients with resting soundly, managing sorrow, dealing with tension and distress, and enhancing mental wellness with the help of experimentally demonstrated strategies like Cognitive Behavioral Therapy (CBT), Mindfulness, and dialectical Behavioral Therapy (DBT). Some features are free, yet some content can only be accessed through a paid subscription [20].

4.5. Jumping Minds

AI-powered applications help people with mental health issues. Jumping Minds app offers peer-to-peer assistance and guidance from health experts to make the users feel better. In this application, a person can open his heart and talk to others facing the same situation without revealing their identity. So, the person does not need to fear being judged or affected by others' opinions. It uses matching algorithms to find pears for a user so that they can inspire each other. The App also maintains a dashboard that keeps track of the analysis and improvement in one's mental wellness. It provides 24*7 support using a Chatbot named Snuggles, a stress booster and empathetic Panda. It is a "Go-To Feel Better" innovative AI platform that improves mental wellness by providing "Friends Therapy". It also provides the facility of M-corner, a lonely, personalized, leisurely corner to reduce stress.

4.6. Being

An AI-powered mental health app treats individuals with mental health concerns by providing therapeutic advice and emotional support via a conversational chatbot interface. Being app was founded by Varun Gandhi and Abhishek Sharma in 2020. In this App, the users are given three ways to deal with their mental health issues. The first option includes therapy sessions that are small and interactive. Expert mental health professionals design these sessions, and they provide Mindful Cognitive Therapy (MCT). The second option includes a journaling session in which users are provided with specific prompts to know about the feelings of the user. As the user starts responding, the AI will add further questions. The third option includes a "quick bite" session for people who do not want to spend much time. The App provides psycho-educational content so users can understand the issue and quickly reduce stress. PSY provides personalized educational content for the user. It is available freely for the first 14 days; then, a user must pay for its services. It is a science-backed AI app that works on CBT to help people with stress and anxiety.

4.7. Mood Fit

AI has proven itself to be a revolutionary force in improving the accessibility, effectiveness, and customization of mental healthcare, from mood monitoring to chatbot-driven treatment and referrals from specialists. Moodfit app was founded by Roble Ridge Software LLC in 2015. It is an application that helps track users' moods using daily exercises, which helps acknowledge and tackle negative emotions, feelings, and thoughts that the users are experiencing daily. This AI-powered App uses CBT and a questionnaire to assess mental health. It comprises customizable features, including setting goals and tracking progress daily. It also provides the user with reminders for completing the exercises and keeps them motivated to improve their mental health. This App is free and involves in-app purchases to use additional features. This App can be utilized to enhance the overall mood and reduce symptoms related to issues such as anxiety and depression. It is a supportive companion that helps attain goals and maintain healthy habits daily. It also provides users with a track report on a weekly or monthly basis to determine the progress, patterns, and insights on users' activities.

4.8. Calm

AI-driven mental health apps offer more advanced mood tracking and possibly more engaging kinds of support to treat people with mental health issues. Calm was founded by Alex Tew and Michael Acton Smith in 2012. Calm is an easy-to-use mental wellness app that provides features such as mood tracking, bedtime stories, meditations, and relaxing music to assist users in sleeping better, reducing anxiety, and becoming more mindful. This app is well known among mental fitness advocates and is famous for including sleep stories in the voices of celebrities such as Harry Styles, Kate Winslet, and Idris Elba. Calm can be downloaded free of cost. A user needs to sign up to use the features of the App, and upon signing up, the user gets a free trial for seven days, and then the user needs to get a Premium subscription to access the full suite of features [21].

4.9. Headspace

AI technology in mental health apps provides people with mindful activities to treat mental health issues. Headspace was founded by Andy Puddicombe, a former monk, and Richard Pierson in 2010. It is an easy-to-use app that offers various guided meditations and mindfulness activities. Headspace is an AI-driven and science-supported application in care and meditation, providing resources to assist with lowering stress, fabricating versatility, and helping better sleep. Headspace has forever been centered on meditation, with a list of A-Z sessions. Courses for handling stress, anxiety, and depression are accessible on the application. Many courses are available inside the three-level system: master, practice, and learn. It incorporates progressed meditations for additional experienced clients and video recordings for youngsters and adolescents. Headspace flaunts an expansive and copious library of meditations, ranging from stress to uneasiness, and even meetings designed for handling certain feelings, such as loneliness and outrage. Headspace, a well-known meditation platform, uses machine learning algorithms to create customized meditation packs tailored to each user's needs and contexts, such as managing cravings or building resilience. Utilizing AI algorithmically adapts self-care routines, adding data-driven insights to expert coaching. It helps track progress, provides customized content, and adjusts meetings given developing client needs. It uses AI to establish a peaceful climate for mental well-being through various media and directed meditation exercises [22].

5. ANALYSIS OF TEXT-BASED AI APPS FOR MENTAL HEALTH CARE

The nine text-based AI apps have been selected for this review by employing a systematic approach that adhered to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, as shown in Figure 3. The applications were primarily identified through searches on the Google Play Store and Apple App Store using different search terms, including mental health chatbot, AI therapy app, and emotional wellness assistant. The inclusion and exclusion of apps were done through a screening process. The criteria for inclusion emphasized applications that featured text-based interactions through chatbots, Cognitive Behavioral Therapy (CBT), high user ratings (greater than 3.5 stars), a significant number of downloads (over 50,000), and positive feedback from users. The criterion for exclusion was focused on the lack of clear AI-based text interaction, low ratings, or lack of primary focus on mental health support.

The process of data extraction involved collecting information on the number of downloads, user reviews, app ratings (on both Google Play Store and Apple Store), supported platforms (Android, iOS, web), clinical validation status, privacy compliance (e.g., HIPAA), and recognitions (updated in 2024). This information was systematically compiled and is shown in Table 2.

6. DISCUSSION

Technological innovations in the mental healthcare have significantly impacted individuals' ability to adapt rapidly and securely to rising emotional well-being necessities. The evolution of transformations and virtual solutions utilizing AI in the mental healthcare field is being employed to address the rapidly growing needs of individuals due to a lack of resources in the mental healthcare system. Technology is becoming more innovative and is assisting people in addressing their mental health issues in many ways. Besides those mentioned in the previous section, many mobile applications available on Play Store mobile phones can help address individual demand. In the above section, some apps have been discussed and compared based on app downloads from Google Play Store, reviews on Play Store, app ratings in stars on both Google Play Store and Apple Store, and recognitions of these applications have also been discussed. The number of apps downloaded is shown in Figure 4 below. It can be seen that the Calm app has the most downloads, 50 million, and then Headspace has 10 million downloads.

The reviews of users on Play Store are shown in Figure 5, and it can be seen that the Calm app has the highest number of reviews, 561K, and then headspace with 312K reviews.

The app rating in stars for different mental health applications shows users' satisfaction and the overall quality of the apps. The high rating specifies the affirmative experience of users in using these text-based apps. The ratings given by users on Google Play Store and Apple Store in stars for the apps discussed are shown in Figure 6.

Users highly rate the apps, but it is essential to do comprehensive evaluations to understand the quality of apps from professional as well as individual points of view so that improvements can be made. The various text-based AI-powered mental health applications discussed above can provide assistance and guidance to individuals 24*7, which permits people to get help whenever they need it. All these apps can be used to solve people's mental health issues in different ways and enhance access to mental healthcare services, making it easy for individuals to access these apps. The mental health sector has expanded rapidly in the past few years, with caring for oneself, consciousness, and psychological wellness at the top of someone's priority

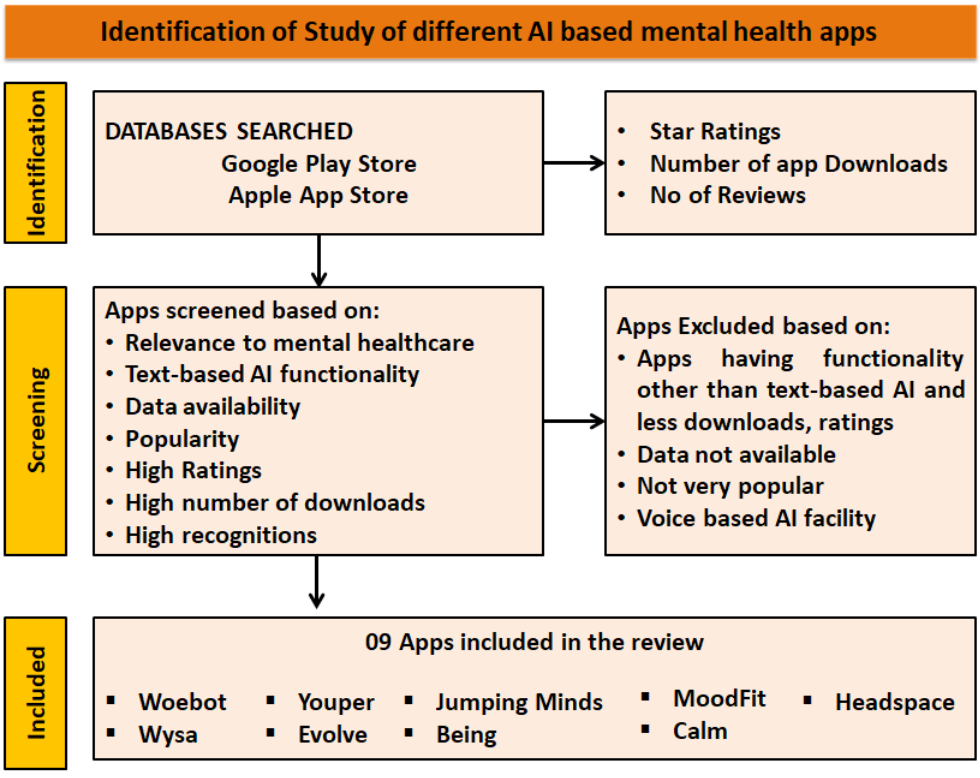

Figure 3 | PRISMA model for selection of Apps.

Table 2 | Usage of text-based AI apps based on app rating, downloads, Recognitions

AI Chatbot	Google Play Store Downloads	Reviews on Google Play	Rating on Google Play and Apple Store (in stars)	Supported Platform	Clinical Validation	Privacy Compliance	Recognitions
Woebot	500K+ (0.5 million)	12.4K [23]	Google Play 4.1 Apple Store 4.7 [24]	Android and iOS	Clinically Validated	Use cloud-enabled infrastructure and adhere to HIPAA (Health Insurance Portability and Accountability Act) regulations.	Winner of Best Overall Mental Health Solution for 2023 at the 7th annual MedTech Breakthrough Awards [25]. Winner in the "Standout Well-Being App" category in the 2019 Google Play Award [26]. The App successfully passed the US's new Digital Health Assessment Framework (DHAF) standards [27]. It was selected in the "Best in Class" quarter-finals in the 2022 Mental and Behavioral Health Category. It was named one of the world's top startups by Norrsken Impact [28].
Wysa [30]	10L+ (1 Million or 1,000,000 + downloads) [29]	Google Play: 146K Apple Store: 20.2K	Google Play: 4.7 Apple Store: 4.9	Android and iOS	Clinically Validated	It has a 3rd party audited Information Security Management System (ISMS) and a Privacy Information Management System (PIMS). It is certified for ISO 27001:2013 and ISO 27701:2019. It is also Cyber Essentials certified. It is compliant to DCB 0129 Clinical Risk Management Standard. It has also been DTAC approved by NHSX.	The latest report published by ORCHA (the Organisation for the Review of Care and Health Applications) in 2020 found that Wysa was the most downloaded App for managing stress and anxiety during COVID-19 [31]. It was declared that Wysa meets the "NHS UK's DCB 0129 Standard of Clinical Safety" in 2019. Wysa has been used by over 1.2 million users across 30 countries [32].
Youper [34]	1M+ downloads [33]	Google Play: 48.4K Apple Store: 14.7K	Google Play: 4.6 Apple Store: 4.8	Android and iOS	Clinically Validated	Do not follow HIPAA guidelines	Bloomberg declared the App to be "The Pandemic Therapist." Google declared the App "A truly holistic approach to wellbeing." Apple declared the App "A pocket counselor guiding you" [35].

Evolve [37]	5L+ (0.5 mn) [36]	Google Play: 12T	Google Play: 4.5 Apple Store: 4.8	Android and iOS	Not Clinically Validated	Do not adhere to HIPAA guidelines.	Declared as one of the best apps used for Evolve, it has been named as one of the best apps for "personal growth" in "Google Play's Best of 2021" [20]. The App has raised an amount of Rs. 2.5 crore in a funding round led by Indian Angel Network [38]. In 2022, the Appraised Rs. 3 crores in a funding round led by Rajesh Ranavat, executive director of Fund Strategic Holdings [39].
Jumping Minds [41]	5L+ (0.5 mn) [40]	Google Play: 8.54T	Google Play: 3.7 Apple Store: 3.9	Android, iOS, and Website	Not Clinically Validated	Adherence to the Children's Online Privacy Protection Act's (COPPA) standards	It was declared the "Medix Global Digital Health Innovation Challenge" winner in 2023 [42]. The App was declared the "Best Android app of 2021 for India by Google" [43]. This App was recognized as "Best Hidden Gem" on Google Play in 2021 [44].
Being [46]	500K+ (0.5 mn) [45]	Google Play: 5.38K	Google Play: 2.8 Apple Store: 4.4	Android and iOS	Not Clinically Validated	Do not adhere to HIPAA guidelines.	The App was declared Google Play's "Best app for health and wellness" in 2021 [47].
MoodFit	50K+ (0.05 million) [48]	Google Play: 799	Google Play: 4.2 Apple Store: 4.7	Android and iOS	Not Clinically Validated	Do not adhere to HIPAA guidelines. No information disclosed is to outside parties. Data is encrypted in transit.	The App was recognized as the "Best Overall Mental Health App of 2020, 2021 & 2022". This App was declared the "Best Mood Tracker of 2023" [49].
Calm [51]	50M+ (50 mn) [50]	Google Play: 561K	Google Play: 4.4 Apple Store: 4.8	Android, iOS, Desktop	Clinically Validated	Do not follow HIPAA guidelines	Apple declared the App the "iPhone App of the Year" in 2017. Declared as "Best of 2018" by Apple. Won Editor's Choice Award" in 2018 by Google Play [52].
Headspace [54]	10M+ (10 mn) [53]	Google Play: 312K	Google Play: 4.5 Apple Store: 4.8	Android, iOS, Website	Clinically Validated	It follows the guidelines and regulations established by ISO 27001, HITRUST, SOC 2 Type II, HIPAA, and 27002.	Headspace partnered with Virgin Pulse, a digital-first health, well-being, and navigation company, to offer mental health services to its 2,000 employees in 2021 [55]. In 2022, Headspace was found to be among the top three mental health apps, as it was forecasted to generate $5 million in in-app revenue worldwide [19].

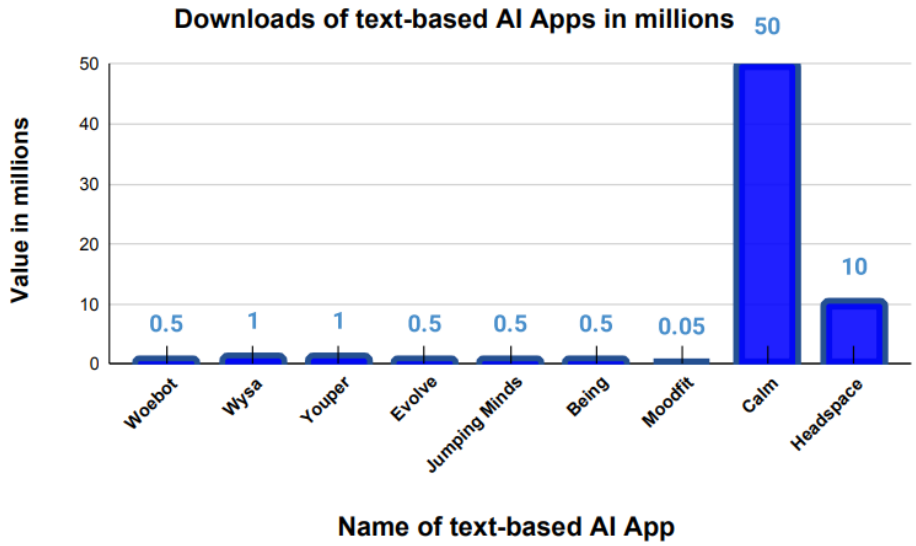

Figure 4 | Downloads of text-based AI apps in millions.

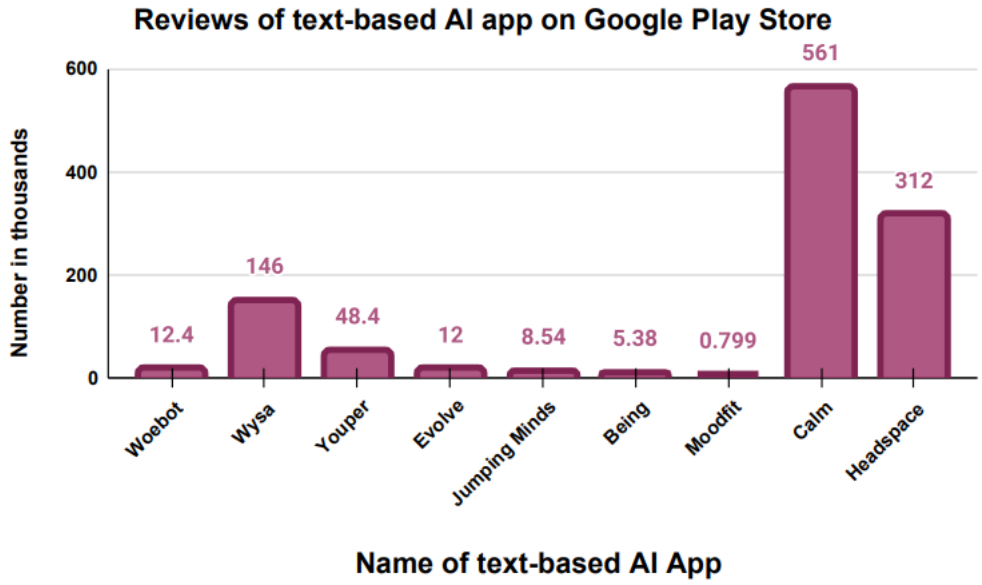

Figure 5 | Number of reviews of text-based AI apps on the Google Play Store.

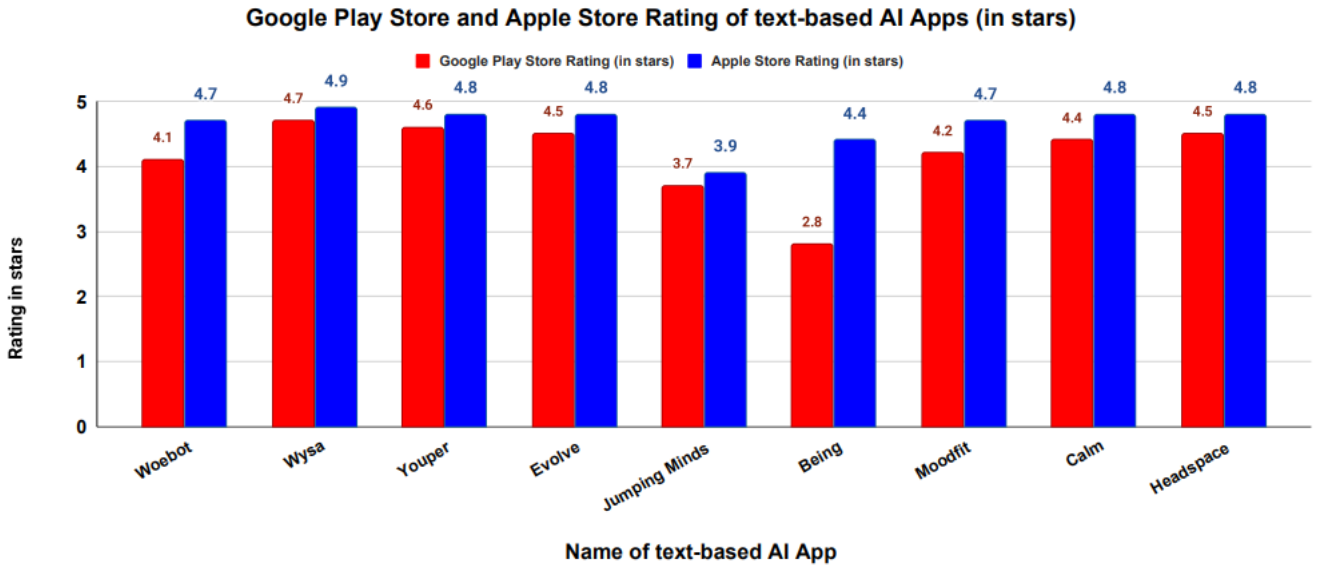

Figure 6 | Rating of text-based AI Apps in stars on Google Play Store and Apple Store.

list. With hundreds of thousands of customers worldwide, the meditation and relaxation app Calm has made an identity for itself as one of the most well-known and prosperous wellness businesses in this booming sector. A creative customer-focused marketing approach that integrated influencer collaborations, data-driven analytics, emotive tale-telling, and content variation propelled Calm's climb to the top of the congested app market. Calm has also used celebrity endorsements to spread awareness about the app. Engaging prominent personalities like Matthew McConaughey to portray unique sleep stories was one of the company's strongest alliances, with influencer McConaughey's calming voice rapidly gaining popularity among fans, drawing in new clients interested in dozing off to the actor's meditation tips. Calm has collaborated with fitness influencers who advertise the smartphone application on YouTube, Instagram, and TikTok, in addition to celebrity narratives. These influencers often talk about how they ended up using Calm to improve their mental health and the positive effects of meditating. Calm has a lot of competition in this market due to the availability of thousands of apps. However, Calm differentiates itself by engaging creatively and investing significantly in brand uniqueness [56].

Apps like Woebot and Wysa use chatbots to provide interactive therapy sessions and track changes in mood. Headspace and Calm apps employ AI technology to provide tailored meditation and deliver mindfulness content. Chatbots used by the applications help provide immediate support using conversations, whereas algorithm-based content delivery provides personalized experiences. Understanding the differences between various apps is important to determine the most suitable app for one's specific needs.

Despite providing favorable mental health guidance, these applications possess shortcomings. Woebot and Youper fail to provide urgent support or instant medical assistance. Wysa sometimes struggles to provide a concise and clear reply to a question. Rather, it changes the topic of conversation, which can be irritating [57]. The drawbacks of Evolve and Being.ai include the likelihood of data misinterpretation, excessive reliance on technological devices, and concerns about data privacy, necessitating ongoing AI model assessment and upgrading. The Moodfit and JumpingMinds applications may sometimes operate slowly [58,59]. JumpingMinds' Appstore visibility has to be improved. Less free chat time is available to test the effectiveness and determine whether spending the extra money is worthwhile. It includes a referral program that is improperly designed. Calm app does not have an add "friends" feature. The sleep stories tend to be lengthy for some users. Headspace might not be as useful for experienced users because most content is designed for novices. One must enter credit card details for an automatic renewal during the free trial of the Headspace app. The free edition has far less functionality than the subscription version of both Calm and Headspace apps.

It is essential to recognize that many of these applications lack clinical validation. Apps like Woebot, Wysa, Headspace, and Calm have undergone clinical trials, and many others depend on user feedback and anecdotal evidence. This lack of scientific assessment highlights the necessity for more thorough studies to determine their effectiveness. Future research needs to focus on clinical trials and longitudinal studies to determine the long-term effects of these applications on the mental health of people. It is critical to determine the probable long-term implications of AI in mental health care. While AI can improve accessibility and customization, it can also raise significant concerns regarding its impact on the relationship between doctors and patients. Excessive dependence on AI could lead to a loss of personal touch in care and reduced human interactions, which are crucial for successful mental health treatment. It is imperative to balance the benefits offered by AI and the importance of maintaining human connections to ensure a comprehensive approach to mental health care.

7. ETHICAL CONSIDERATIONS

The opportunities offered by AI in mental healthcare are significant, but it is necessary to recognize and address ethical and privacy issues that arise from using these AI-powered applications. Tackling these issues is essential for ensuring the responsible and secure implementation of the different mental healthcare applications.

Data security and privacy: Mental health applications collect sensitive personal details of users, which comprises emotional condition, thoughts, and personal experience. So it is necessary to safeguard this data. Mental health apps such as Headspace, Calm, Woebot claim that they comply with HIPPA and GDPR regulations, while some other applications do not comply with these regulations. So, there is an urgent need for enhanced transparency in their data management practices. Strong encryption standards should be implemented for the safety of data. Users should be made aware of the processes involved in the storage, processing, and sharing of their data. The risk associated with third-party access to private data presents significant privacy issues. It is necessary to follow rigorous safety measures to protect data of users.

Algorithmic Baisness: The training of AI algorithms depends on the collected data, and if that data is biased, then the algorithms will keep on reflecting these biases. This can result in inequality in the quality of care offered to various demographic groups. The variations in cultures of people have a great influence on mental health experiences and expressions. So, AI algorithms need training on a wide variety of datasets to prevent misapprehension and promote cultural sensitivity. The AI algorithms are opaque, and they do not give any clarity on the result, so an increase in transparency can help in gaining the trust of users.

Limitations of AI in mental healthcare: AI chatbots can easily engage in conversations but lack the deep empathy and insights that human therapists provide. AI can help in the detection of patterns and possible mental health disorders, but it cannot be a substitute for professionals. These AI apps cannot prove useful in case of mental health crises or emergencies. It is a risk that the users can become dependent on these AI chatbots, which can become an obstacle in their coping strategies and social support groups. AI is not capable of making ethical judgments in intricate situations.

8. CONCLUSION

AI can enhance the diagnostic process to evolve high-standard patient-centric treatments and foresee clinical results with greater efficiency. The use of mental health care apps offers customized support to individuals by utilizing ML algorithms that can learn about users' needs, understand their preferences, and personalize the responses accordingly. More research is needed to ensure the success of text-based AI-powered applications used in mental health care. The utilization of chatbots in treating mental health patients is still in its infancy and needs

to be used carefully. Advanced technologies in the healthcare field can positively and negatively impact the mental healthcare industry; thus, much research is needed to improve the positive implications. The future of AI in applications is very bright. It needs more support from the healthcare industry and individuals so as to enhance the utilization of the apps developed, especially for people suffering from mental health issues such as stress, anxiety, depression, and many more. With proper direction, support from people and mental health experts, and a moral perspective to protect the data of users, mental healthcare applications can prove to be valuable assets in helping people with mental health issues.

Although mental health applications are more convenient and accessible, they have a number of disadvantages. These applications offer generic content that might not be customized to a user's requirements or address particular mental health issues. The therapeutic interaction with an authorized psychological practitioner cannot be replaced by mobile applications. Effective therapy requires the building of credibility and confidence, both of which might be hindered by an absence of face-to-face connection. Apps for mental health acquire private information, which raises issues regarding misuse of data and breach of confidentiality. Apps may differ greatly in regard to how safe user data is. Individuals may be cautious to divulge confidential details within an app out because of the risk that their private data might be stolen. Numerous apps of varied quality have appeared on the app stores for mental health, and lots of them lack scientific validation. Users may find it difficult to differentiate between applications which are effective and which are not.

DECLARATIONS

Conflict of Interest

The authors declare that they have no conflicts of interest.

Authors' Contribution

SBG is primarily responsible for selecting the topic of article and suggesting modifications. MG guided SG to write the entire article, while SG wrote the main manuscript text. The manuscript was evaluated by each author.

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