Therapy Without a Therapist

Chatbots and Artificial Intelligence in Mental Health

Caleb W. Lack, PhD[a,*], J. Kyle Haws, PhD[b]

KEYWORDS

• Chatbots • Artificial intelligence • Large language model
• Natural language processing • Psychotherapy • Mental health

KEY POINTS

- Psychotherapy delivered via various forms of technology has progressed rapidly in the past two decades, including recent advances in using chatbots and other artificial intelligence (AI)-powered programs.
- Research on the use of large language models and generative AI to supplement or replace interaction with a human psychotherapist has progressed significantly in the past two decades.
- Multiple meta-analytic reviews point to short-term relief of certain mental health symptoms, like depression, with mixed evidence for anxiety symptoms and quality of life.

INTRODUCTION

As we move into the second quarter of the twenty-first century, more and more of society is interacting with various non-human, software-based intelligences daily. This may be asking your home smart speaker about the weather or when your favorite restaurant opens, calling for a driverless car to pick you up to go get groceries, seeking advice on how to make your angry letter to your boss sound more professional, or millions of other things. But what if you are feeling depressed and sad, or worried and nervous? Could interacting with a piece of software take the place of seeing your mental health provider? This article provides an overview of the use of software for helping those with mental health problems decrease their symptoms and improve their quality of life.

The origins of "software as therapist" date back to 1964 and the work of Joseph Weizenbaum on a program he called ELIZA.[1] While exploring ways for humans to

[a] Department of Psychology, University of Central Oklahoma, 100 N University Drive, Edmond, OK 73034, USA; [b] Department of Psychiatry, University of Colorado Anschutz Medical Campus, 13199 E. Montview Boulevard, Suite 300, Aurora, CO 80045, USA
* Corresponding author.
E-mail address: clack@uco.edu

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Abbreviations	
AI	artificial intelligence
GenAI	generative AI

interact with computers in a more natural language style, rather than in coding programs, Weizenbaum developed a specific version of ELIZA he called DOCTOR, which provided responses to typed inputs, mimicking what a Rogerian psychotherapist would say to a patient.[2] In essence, the DOCTOR program used non-directive reflection, or turning the question back to the patient in a slightly different manner, thereby causing the patient to examine their own thoughts, emotions, and behaviors more carefully. Although not capable of passing the Turing Test (or being able to exhibit intelligence that is indistinguishable from that of a human), it did work well enough to serve as an early example of what are most often now called chatbots, laying the foundation for the use of software programs to potentially supplement or replace psychotherapy-style interactions.

Starting in the 1980s, we began to see an increasing interest in the use of technology to assist people with various types of mental health disorders, including anxiety, depression, and obsessive-compulsive disorder,[3] with very promising early results.[4] These interventions, however, were generally very highly guided, structured programs designed to take a user through a specific type of intervention, usually a cognitive-behavioral therapy one, much like a self-help book.[5,6] While such applications were often tested for efficacy, and frequently found to be useful in terms of decreasing symptoms, they also tended to be relatively limited in terms of natural interaction or use of natural language with the program itself and did not "feel" like you were interacting with a therapist.[7]

Starting with the rise of handheld computing, and especially with the widespread adoption of handheld smartphones around 2012, there was an explosion of technology purporting to help improve mental health symptoms in various ways.[8] The overwhelming majority of such applications ("apps" for short) failed to provide evidence that they are in fact effective, despite claims promising quick and simple symptom relief.[9] As such, even with easier access than ever before to mental health-related technology, with more options than ever before, we have yet to see a mental health technology "revolution" where effective digital care options are the normal.

While most mental health apps were and still are somewhat rigid and feel like you are interacting with a program rather than a person, advancements since ELIZA in using more natural language and interaction were somewhat stalled until recently. The rise of research in the field of artificial intelligence (AI), especially with advances in using various types of machine learning processes such as large language models, has presented a huge step forward in potential for clinical use in multiple fields of health, including mental health.[10] This article will summarize the current state of the literature in terms of the use of AI in various forms to supplement or even replace traditional mental health practitioners, as well as make recommendations for future study and issues of concern.

ARTIFICIAL INTELLIGENCE AND PSYCHOTHERAPY

AI is a broad term for technology that allows computers (or other machines) to simulate complex tasks typically only done by humans, including natural language interactions, complex decision making, to name a few.[11] In short, AI attempts to do things that human intelligence can do. Of particular interest for this article is what is often referred to as generative AI (GenAI), typically defined as an AI model that can create new content

based on whatever existing database it has been trained on.[11] For GenAI in mental health, this means it has been trained on large amounts of text, from various sources including those on the Internet as well as traditional books and journal articles. Taking a general GenAI (such as ChatGPT) and then training it on further custom data, such as mental health information, is referred to as fine-tuning and results in improved performance in a specific domain.[12] In the field of mental health, such fine-tuning and training would ideally translate to a GenAI with a robust set of discrete skills that make someone a "good clinician," including but not limited to establishing rapport, understanding emotions, being empathetic, accurately reflecting content, displaying positive regard, and instilling hope.[13] Depending on the training source and goals, GenAI could also offer interventions from a particular therapeutic modality, such as cognitive restructuring.

Unlike older digital apps, which were often constrained in both input options and in the responses generated, using modern AI systems to power chatbots allows for much more natural interaction. This naturalistic and novel response to user inputs is vastly different from prior rule-based chatbots like ELIZA or the decision tree logic following chatbots often seen in pre-GenAI digital interventions.[12] The use of natural language processing allows these chatbots to understand nuances, context, and attitude more readily from users. Indeed, one recent study found users were often unable to distinguish between responses generated by therapists and those generated by a ChatGPT-powered AI.[14] Other studies have found high ratings given to GenAI responses by users in both medical[15] and therapeutic contexts.[16]

Given the high burden that mental health struggles place on modern society[17] and the gap between number of providers and those seeking services,[18] solutions are desperately needed. Use of GenAI chatbots to help fill that need has been proposed by a number of entities.[19,20] Such technology has been described as potentially more easily accessible and affordable than traditional psychotherapy,[21] as well as potentially lacking the stigma that may be associated with seeking such help.[22] Of course, there is a difference between having participants rate whether they could tell whether a response was from a human or an AI, or whether they liked that response, and actually benefiting clinically from an interaction with an AI. So, what does the data tell us at this point in time?

OUTCOME RESEARCH ON THERAPEUTIC ARTIFICIAL INTELLIGENCE

Although GenAI chatbots are still relatively new technology, a significant amount of research has emerged on them over the past half-decade. This has built on the prior research on rule-based chatbots and other types of digital interventions, leading to several scoping reviews and meta-analyses to try and make sense of the overall findings. This review will focus on meta-analyses that have been conducted and published, rather than summarizing individual study results, to give a better overall picture of where the literature stands.

An early meta-analysis of chatbot studies published prior to 2020 found statistically but not clinically significant impacts on depressive symptoms, no significant impact on anxiety or affect, and no impact on overall psychological well-being.[23] A similar 2022 meta-analysis found significant depressive symptom decreases ($g = 0.54$) across 11 studies published between 2009 and 2017.[24] It is important to note that the studies included in both these meta-analyses were using rule-based chatbots, before widespread use of GenAI.

In a meta-analysis of studies published prior to June 2023, 15 randomized controlled trials were found that examined chatbots' impact on mental health.[25]

Interestingly, although they found significant positive impacts from these interventions on depressive symptoms (g = 0.64) and overall distress (g = 0.7), there was not a clinically significant impact found on overall psychological well-being (g = 0.32). Non-significant results were also found for anxiety symptoms and both positive and negative affect, but fewer studies that measured those variables were within this sample. From more fine-grained analyses, the researchers concluded that the highest symptom impact was seen from GenAI chatbots compared to older, more rule-based chatbots.[25]

A second meta-analysis published in 2023 included both published and unpublished papers, for a total of 32 studies.[26] Results found statistically significant, but small, short-term effects on symptoms including depression (g = 0.29) and anxiety (g = 0.47), among others. However, long-term outcomes for mental health outcomes were not as robust, with effect sizes dropping by half or more in those studies that tracked symptoms past the end of the intervention (depression g = 0.16; anxiety g = 0.11). The researchers recommended further study that compared chatbots to more typical guided digital interventions rather than a control condition, as well as further study of dosage effects and examination of ways to improve long-term outcomes.[26]

In a 2024 meta-analysis that focused only on efficacy for depression and anxiety, 18 randomized controlled trials containing almost 3500 participants continued to find similar results.[27] Effect sizes for depressive symptoms showed statistically significant decreases (g = 0.26), as did anxiety symptoms (g = 0.19), although the clinical significance of both is questionable. Dosage effects also appeared, with significantly better effect sizes at 8 weeks compared to 4 weeks. However, analysis of symptoms for a 3 month follow-up period showed that even these small effects went away, with no significant impact for either depressive or anxiety symptoms being seen at that point.

In the largest and most comprehensive meta-analysis of its kind to date, Lau and colleagues examined 30 randomized controlled trials.[28] It focused on symptoms of depression, anxiety, and stress and specifically wanted to examine both immediate post-intervention as well as long-term outcomes. The data analyzed included trials published between 2009 and 2022, encompassing around 6100 participants interacting with 14 different types of AI-powered chatbots (including more well-known ones such as Deprexis and Woebot). Roughly half the studies used rule-based chatbots, while the other half used various types of GenAI. Overall, results are similar to the prior meta-analyses. For depressive symptoms, significant reductions and medium effect sizes were seen immediately post-intervention (g = 0.54), with 6 to 12 month follow-up effects dropping significantly (g = 0.23). For both anxiety symptoms and stress, though, no statistically significant effects were seen at either immediate post-intervention or follow-up assessments. Meta-regression analyses did not find any significant covariates on the primary outcome symptoms, including gender or date of publication.[28]

In what is likely a preview of future research, a team from the Dartmouth College published an randomized controlled trial (RCT) using a waitlist control that examined whether a GenAI chatbot called Therabot was effective for depressive, anxious, and eating disorder symptoms.[29] This chatbot was specifically trained for mental health treatment, and found significant decreases in symptoms of major depression and generalized anxiety compared to the waitlist controls post-intervention and in a month-long follow up. Other teams are also working on fine-tuning GenAI chatbots into treatment providers,[30] with further clinical trials on the horizon.

In summary, there has been considerable consistency across meta-analytic studies examining how much of a mental health benefit can be seen from chatbot interactions. A constant result from the studies was noted improvements in depressive symptoms

during the interventional period itself, although the results on other areas, such as overall quality of life or anxiety symptoms, were mixed. Further, follow-up assessments show very large decreases in effect sizes, often dropping by half or more within 3 to 6 months. The most recent, largest study was able to examine potential age effects, finding no significant improvement of efficacy by chatbots across time, despite increases in the use of GenAI compared to rules-based chatbots. This is backed by the results of earlier meta-analyses, which mostly included rule-based chatbots, not having worse overall outcomes. While new GenAI models are on the horizon, much work is still to be done to show comparable outcomes to gold-standard psychological treatments.

CONCERNS AND FUTURE DIRECTIONS

As reviewed earlier, meta-analyses have shown small but significant impacts on certain aspects of mental health with the use of chatbots, both rule-based AI and the more recent GenAI models. However, as with any new technology used in health care, caution must be taken to not become so enamored and excited by the shiny new toy that clinicians and researchers fail to properly assess both benefits and potential risks. Several major concerns about the use of AI, and GenAI in particular, have been noted by observers. One is that although GenAIs like ChatGPT can effectively generate responses that appear to show emotional awareness, they only do so at a general level, rather than a level typically seen by mental health professionals with training in doing so.[31] Such mimicry is also based purely on textual analysis, rather than having and experiencing emotions or even using non-textual cues like body language or voice tone, and thus may be missing critical pieces of information.[21]

A second concern is long-term memory and continuity of care from GenAIs. A key aspect of the work that expert psychotherapists do is integration of information from past sessions to the current one, and long-term planning for future sessions based on goals. While GenAI systems typically have a good short-term memory within a particular user session, maintaining a continuous, cohesive therapeutic relationship appears to be beyond their typical capabilities for now, although work is proceeding in this area.[27] Biases in GenAI are also a concern, given that choices made in what information to train the models often reflects the priorities and/or biases of those developing them.[32] Next, numerous researchers have highlighted ethical issues present in the use of such systems. Although a full review of ethical concerns raised by the use of GenAI systems is beyond the scope of this article, the issues of patient privacy and confidentiality,[33] transparency of what goes into these models,[19] and potential lack of collaboration between program developers and mental health professionals[34] have all been commonly cited concerns.

A final point to be raised is the overall effectiveness of these interventions. Although many researchers describe how GenAI chatbots have “revolutionized psychotherapy,”[27] such comments need to be taken with a grain of salt. As reviewed earlier, meta-analytic studies have consistently shown small but significant impacts of chatbots on some aspects of mental health, particularly depressive symptoms in the short-term. Other areas of mental health, such as anxiety symptoms, seem to show little change due to chatbot interaction. Further, long-term follow-ups consistently show a massive decrease in effectiveness across time, spurring concerns about how useful such interventions actually are. Even if users are viewing these GenAI chatbots as “understanding, validating, patient, kind, non-judgmental, always available,”[35] is that enough if research shows no positive benefit on most aspects of mental health and no long-term benefits of such interactions?

As the literature grows, future studies should take efforts to build more focused GenAI models. Training new models specifically on our most well-established psychological change principles, or for particular types of psychopathology and the maladaptive cognitions, emotions, and behaviors seen in those, will be crucial. Just as a human psychotherapist should not try to apply the same exact treatment plan to anyone who comes to them for help, a GenAI must be "smart enough" to both come to a solid diagnostic and case formulation for a particular user and then develop a long treatment plan to help address individual needs. Given the lack of differences that appear to be seen at this time in effectiveness between older rule-based chatbots, which are typically highly structured by their creators for a particular type of problem, and GenAI chatbots, this lack of specificity and planning may be a major flaw preventing a true paradigmatic shift from occurring. Researchers may also find it helpful to combine rule-based chatbots with GenAI chatbots, where there are both broad guidelines about how treatment should typically go and increased flexibility and engagement via natural language interactions. This would be creating something like what human psychotherapists do when following treatment manuals and gold-standard therapy guidelines: tailoring large scale, nomothetic treatments to a particular individual. This concept of "flexibility within fidelity"[36] would more closely resemble best practice standards for psychotherapy and may represent a way forward that leverages the advantages of both rule-based and GenAI chatbots while addressing their shortcomings, such as continuity of care and bias.[21]

SUMMARY

Technological advances in the medical field are often exciting, promising to help improve health care, make the provision of care easier for the providers, or ease access to such services. The hype surrounding the integration of AI into mental health has followed this same pattern. At the current time, however, the data do not support the idea that AIs will take the place of human psychotherapists at any point in the near future, even as they become exponentially more powerful and more able to mimic certain tasks. Research into the use of chatbots for mental health struggles needs to become focused on making more specific, well-trained GenAI models that behave more like a real therapist does, especially in terms of planning ahead and providing good continuity of care. Until then, such programs can be seen as likely helpful for small improvements and short-term relief of depressive symptoms, but not much more.

CLINICS CARE POINTS

Using chatbots or other AI-powered programs for therapy…

- Shows promise for short-term relief of depressive symptoms in particular.
- Has little current evidence to point to long-term positive changes in mental health.
- Should be approached cautiously in light of potential ethical and clinical concerns.
- Is an area where continued research is greatly needed.

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REFERENCES

1. Weizenbaum J. ELIZA—A computer program for the study of natural language communication between man and machine. Commun ACM 1966;9(1):36–45.
2. Bassett C. The computational therapeutic: exploring Weizenbaum's ELIZA as a history of the present. AI Soc 2019;34(4):803–12.
3. Lack CW, Storch EA. The use of computers in the assessment and treatment of obsessive–compulsive disorder. Comput Hum Behav 2008;24(3):917–29.
4. Cavanagh K, Shapiro DA. Computer treatment for common mental health problems. J Clin Psychol 2004;60(3):239–51.
5. Newman MG, Consoli AJ, Taylor CB. A palmtop computer program for the treatment of generalized anxiety disorder. Behav Modif 1999;23(4):597–619.
6. Schneider A, Mataix-Cols D, Marks I, et al. Internet-guided self-help with or without exposure therapy for phobic and panic disorders. Psychother Psychosom 2005;74:154–64.
7. Minerva F, Giubilini A. Is AI the future of mental healthcare? Topoi 2023;42(3):809–17.
8. Lipschitz J, Miller CJ, Hogan TP, et al. Adoption of Mobile apps for depression and anxiety: cross-sectional survey study on patient interest and barriers to engagement. JMIR Ment Health 2019;6(1):e11334.
9. Abbot D, Lack C, Anderson P. Does using a mindfulness app reduce anxiety and worry? A randomized controlled trial. J Cogn Psychother 2023;37(1):26–42.
10. Lawrence HR, Schneider RA, Rubin SB, et al. The opportunities and risks of large language models in mental health. JMIR Ment Health 2024;11(1):e59479.
11. Sheikh H, Prins C, Schrijvers E. Artificial intelligence: definition and background. In: Sheikh H, Prins C, Schrijvers E, editors. Mission AI. Research for policy. Princeton (NJ): Springer International Publishing; 2023. p. 15–41. https://doi.org/10.1007/978-3-031-21448-6_2.
12. Casu M, Triscari S, Battiato S, et al. AI chatbots for mental health: a scoping review of effectiveness, feasibility, and applications. Appl Sci 2024;14(13):5889.
13. Miller WR, Moyers TB. Effective psychotherapists. New York (NY): Guilford Publications; 2021.
14. Hatch SG, Goodman ZT, Vowels L, et al. When ELIZA meets therapists: a turing test for the heart and mind. PLOS Ment Health 2025;2(2):e0000145. Bauer B.
15. Ayers JW, Poliak A, Dredze M, et al. Comparing physician and artificial intelligence chatbot responses to patient questions posted to a public social media forum. JAMA Intern Med 2023;183(6):589.
16. Vowels LM, Francois-Walcott RRR, Darwiche J. AI in relationship counselling: evaluating chatgpt's therapeutic capabilities in providing relationship advice. Comput Hum Behav Artif Hum 2024;2(2):100078.
17. Vigo D, Thornicroft G, Atun R. Estimating the true global burden of mental illness. Lancet Psychiatry 2016;3(2):171–8.
18. Mongelli F, Georgakopoulos P, Pato MT. Challenges and opportunities to meet the mental health needs of underserved and disenfranchised populations in the United States. Focus 2020;18(1):16–24.
19. Beg MJ, Verma M, VCKM M, et al. Artificial intelligence for psychotherapy: a review of the current state and future directions. Indian J Psychol Med 2024;47(4):314–25.
20. Schueller SM, Hunter JF, Figueroa C, et al. Use of digital mental health for marginalized and underserved populations. Curr Treat Options Psychiatry 2019;6(3):243–55.

21. Zhang Z, Wang J. Can AI replace psychotherapists? Exploring the future of mental health care. Front Psychiatry 2024;15:1444382.
22. Hoffman BD, Oppert ML, Owen M. Understanding young adults' attitudes towards using AI chatbots for psychotherapy: the role of self-stigma. Comput Hum Behav Artif Hum 2024;2(2):100086.
23. Abd-Alrazaq AA, Rababeh A, Alajlani M, et al. Effectiveness and safety of using chatbots to improve mental health: systematic review and meta-analysis. J Med Internet Res 2020;22(7):e16021.
24. Lim SM, Shiau CWC, Cheng LJ, et al. Chatbot-delivered psychotherapy for adults with depressive and anxiety symptoms: a systematic review and meta-regression. Behav Ther 2022;53(2):334–47.
25. Li H, Zhang R, Lee YC, et al. Systematic review and meta-analysis of AI-based conversational agents for promoting mental health and well-being. npj Digit Med 2023;6(1):236.
26. He Y, Yang L, Qian C, et al. Conversational agent interventions for mental health problems: systematic review and meta-analysis of randomized controlled trials. J Med Internet Res 2023;25(1):e43862.
27. Zhong W, Luo J, Zhang H. The therapeutic effectiveness of artificial intelligence-based chatbots in alleviation of depressive and anxiety symptoms in short-course treatments: a systematic review and meta-analysis. J Affect Disord 2024;356:459–69.
28. Lau Y, Ang WHD, Ang WW, et al. Artificial intelligence–based psychotherapeutic intervention on psychological outcomes: a meta-analysis and meta-regression. In: Lamela D, editor. Depress Anxiety 2025;2025(1):8930012.
29. Heinz MV, Mackin DM, Trudeau BM, et al. Randomized trial of a generative AI chatbot for mental health treatment. NEJM AI 2025;2(4). https://doi.org/10.1056/AIoa2400802.
30. Frisone F, Pupillo C, Rossi C, et al. SOCRATES. Developing and evaluating a fine-tuned ChatGPT model for accessible mental health intervention. Cyberpsychology Behav Soc Netw 2025;28(5):366–8.
31. Elyoseph Z, Hadar-Shoval D, Asraf K, et al. ChatGPT outperforms humans in emotional awareness evaluations. Front Psychol 2023;14:199058.
32. Akter S, McCarthy G, Sajib S, et al. Algorithmic bias in data-driven innovation in the age of AI. Int J Inf Manag 2021;60:102387.
33. Li F, Ruijs N, Lu Y. Ethics & AI: a systematic review on ethical concerns and related strategies for designing with AI in healthcare. AI 2022;4(1):28–53.
34. Reamer FG. Artificial intelligence in social work: emerging ethical issues. Int J Soc Work Values Ethics 2023;20(2):52–71.
35. Siddals S, Torous J, Coxon A. "It happened to be the perfect thing": experiences of generative AI chatbots for mental health. Npj Ment Health Res 2024;3(1):48.
36. Kendall PC, Ney JS, Maxwell CA, et al. Adapting CBT for youth anxiety: flexibility, within fidelity, in different settings. Front Psychiatry 2023;14:1067047.