

VIEWPOINT

ARTIFICIAL INTELLIGENCE AND PEDIATRIC CARE

Artificial Intelligence in Mental Health Therapy for Children and Adolescents

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Viewpoint

The Need and the Promise

The Centers for Disease Control and Prevention reports that roughly 1 in 5 children have a mental, emotional, or behavioral disorder, but fewer than 20% receive care from a mental health specialist.¹ Technology, including tools that use artificial intelligence (AI), has the capacity to be a “workforce multiplier,” in the words of Wes Williams, vice president and chief information officer of WellPower, Colorado’s largest community mental health service.² There are particular characteristics of children and adolescents that make the application of AI especially valuable; engagement is a key predictor of intervention effectiveness, and this population uses technology at a higher rate than other groups and tends to be comfortable with technology in health care settings. The anonymity of machines can help children and adolescents overcome stigma surrounding mental health and is a nonjudgmental resource.

Artificial intelligence is great at classification and prediction (which is why people often receive advertisements for exactly the thing or service they were discussing at home). Artificial intelligence shows great promise in diagnosing disorders and in predicting mental health crises and alerting health care practitioners.³ It has proven effective in predicting outcomes of treatment in pediatric obsessive compulsive disorder,⁴ attention-deficit/hyperactivity disorder,⁵ and autism for all ages.⁶ WellPower, for example, is hopeful that implementing AI-enabled tools that transcribe therapy sessions will allow therapists to spend more in-session time focused on the client and free up postsession time by providing draft notes. These tools can also analyze the specific therapeutic techniques prioritized by WellPower and give individual therapists feedback on how effectively they are using them. The tools can also alert therapists to potential dangerous ideation or changes in behavior (AI often finds correlations that escape humans).

The Worries

Concerns about uses of AI in mental health are heightened when it is used with children and adolescents. Major concerns include data security, privacy, and informed consent; bias; lack of empathy, contextual knowledge, and the judgment that comes from experience; and for chatbots, their tendency to “hallucinate” (ie, confidently return false or harmful information).

Data Security, Privacy, and Informed Consent

Children and adolescents are particularly vulnerable to the misuse of personal information online. Mental health practitioners using AI-driven tools will want to make sure they are compliant with the Health Insurance Portability and Accountability Act. The European Union (EU)

General Data Protection Regulation (GDPR) sets good standards for security, privacy, and consent. US-based vendors are not subject to the same level of regulation. Mental health practitioners should insist that the tools they create or purchase are GDPR compliant whether or not they are used in the EU. Mental health practitioners should, as part of the consent process, inform clients and their parents or guardians of exactly what data are being collected and by whom, the security measures that protect data storage, how clients can opt for removing their data at any time, when the data automatically sunset, and how data are anonymized.

Bias

Race and ethnicity, poverty, and living in rural areas are associated with exacerbation of pediatric mental health issues.¹ Any mental health professional using AI-assisted technology will want to vet the technology’s creator to see what steps have been taken to protect against harmful biases in the training data sets and in the algorithms. The most essential variable in producing nonbiased AI is the diversity of the team that built it. There are use-specific tools to mitigate bias, such as IBM’s AI Fairness 360 toolkit. Users of AI tools should make sure the developers have deployed such tools.

Bias can often enter a model through the data on which it is trained. Practitioners do not have to accept AI tools trained on massive and uncured data. One of our colleagues at Iliff’s AI Institute is creating a data set of Black English texts and tokens to be used to train culturally specific and appropriate interactive AI that can be deployed in a telephone application as a mental health resource. This work is critical because Black and Hispanic individuals in the US have less access to mental health services than the population as a whole. Not only are tools trained on these data sets expected to be extremely unlikely to express harmful language, they will offer an environment in which trust and connection is possible for a population that, for good reasons, often distrusts medical professionals.

Empathy, Contextual Knowledge, and Judgment

A famous story in the AI world is about ELIZA, a computer program created in the 1960s by Joseph Weizenbaum at the Massachusetts Institute of Technology. He designed it to simulate Rogerian therapy, and ELIZA was intended as a satire—Weizenbaum was skeptical that computers could ever simulate real human interaction. However, his own secretary asked him to leave the room so she could spend more time alone with ELIZA. Artificial intelligence has only gotten better since then. It can perform sentiment analysis on the tone of texts (a popu-

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lar movie rating site uses AI sentiment analysis to aggregate movie reviews). It can disambiguate the meanings of quirky colloquial phrases (eg, "I'm fried"). Social robots are proving to be effective in working with autistic children and in promoting "openness, trust, connection" in assisted living facilities for older adults.⁷ Far from replacing human caregivers and human companionship, a study showed that the presence of social robots was associated with increased time spent in common areas and the number of interactions with other humans, as well as with machines.⁷

Hallucination in Chatbots

Publicly available chatbots running on large language models are trained on massive amounts of data obtained from the internet. They have guardrails in place to prevent harms and errors, but they can be pushed to do things they should not ("jailbreaking"), and they sometimes return false information with a tone of confidence.

Tools created for pediatric mental health can be trained on more curated data. Bots can be trained on transcripts of real sessions led by trained professionals. The bot's conversation can be guided by written rules and lexicons—for example, lexicons based on the Patient Health Questionnaire-9 and on SNOMED CT, which tracks and

normalizes clinical terminology globally.⁸ Some organizations offer data sets that can be used to train AI models created with input from mental health professionals using these techniques.

The Future

Technological improvements in AI applications for pediatric mental health will likely be dramatic and rapid. The major obstacle will stem not from technology but from governance. Scoping and desktop reviews of the literature show little consensus on standards for use of AI in health care.^{9,10} The US is essentially an unregulated space in this field. Artificial intelligence applications in pediatric mental health are expected to evolve so rapidly that some kind of regulatory agency analogous to the US Food and Drug Administration may be a necessity.

The concerns raised about the use of AI in pediatric mental health apps and in therapy are legitimate. However, one could raise the same concerns about human mental health professionals (eg, bias, privacy breaches). These are not reasons to reject human therapists but provide impetus for regulation and professional standards, and the same is true with recent advances in AI. Given the current pediatric mental health crisis, it would be irresponsible not to deploy AI in the mental health sphere.

ARTICLE INFORMATION

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