Role of Artificial Intelligence in Mental Healthcare

Chetna Khanna*

MSc Mathematics, MS Data Science, NLP Engineer - Jeevahealth.ai, Washington, USA

***Corresponding Author:** Chetna Khanna, MSc Mathematics, MS Data Science, NLP Engineer - Jeevahealth.ai, Washington, USA.*

Mental health, an extremely important topic related to a person's wellbeing but sadly a topic which is least discussed in our society. With the fear of being judged and questioned, people generally keep thoughts related to their mental health to themselves. While they love to share their joys with their friends and family whom they feel so connected to but while coming to the topics of mental health these connections seem missing. Results are unfortunately devastating. Issues like these lead to depression and a time comes when a person reaches a state where they are bound to take steps that are unpleasant like self-harm and even suicide. According to WHO, each year more than 700,000 people die by suicide, which is one person every 40 seconds [1].

Why are we discussing this today?

In 2020, when the pandemic hit the world hard, many lost their jobs, businesses closed and people suffered financial losses and major setbacks. However, one thing that people suffered from the most was their depleting mental health. Staying at home, not meeting friends or partners, family separation, travel ban, fights or arguments at home and financial losses depleted the mental health of many.

Evolution of telehealth

It is noteworthy to mention that the healthcare sector found many new ways to safely provide quality care to not only COVID-19 patients but non-COVID-19 patients too. However, the COVID-19 surge was so huge that soon things started going out of control. The only best option was to go digital. This was one of the most crucial steps taken by not only the healthcare industry but many related industries helping or developing products related to healthcare. Soon people started seeing doctors online for non-severe cases. As per Zac Imel, Ph.D., University of Utah, USA, "The onset of CO-VID-19 led to a dramatic increase in the use of telehealth".

AI-powered apps

Metal health is an area that can leverage the benefits of telehealth to the fullest without losing its core values and essence. However, some people knew they were suffering from mental health issues but were still hesitant in using telehealth to consult a doctor. Artificial intelligence played a great role in such cases. People found it convenient to talk to an AI-powered chatbot who will not judge them in any manner and will also provide 24 × 7 assistance. They started considering them as their friend/partners to whom they can talk about anything.

Mental health apps existed in the market even before the pandemic but they gained a lot of traction from 2020. As per a report from the American Psychological Association [2], there are up to 20,000 apps for mental health in the app store currently and many of these apps have millions of users. The trust these apps started getting from users is remarkable. A person can not only talk to these mental health bots like a friend but these apps also monitor users' moods, encourage people to express their thoughts, what triggered those thoughts, and direct them to a correct and healthy path.

These apps use natural language processing - a branch of artificial intelligence that lets machines understand and interpret human language. Many of these apps are designed on the Cognitive Behavioral Therapy (CBT) platform. The models used by these apps are trained with data from diverse sources. To respond to any situation/circumstance, multiple models are trained, each dealing with one or more particular types of problems.

A brief view of what AI-powered apps are doing

Mental health apps have models trained on conversational data to get a sense of how humans converse. To invoke empathy and

emotions in conversations, these apps are also trained on empathetic dialogues to help the bot respond in a particular way in cases like depression, anxiety, anger, etc. Apart from this, these apps also keep track of your mood and keep checking on you daily to see how you are doing. This helps in directing the user to a particular set of resources like readings, exercise, meditation, etc. A few apps ask users to write down things that they are thankful for to keep reminding them that they still have things to cherish in their life. There are also diagnostic tools like GAD [3], PHQ [4] which are generally used by mental health professionals to track current mental state using a questionnaire. Apart from this, these apps generally have safety features built into them. These safety features detect the language of concern, self-harm, and manage risk by providing appropriate responses and helpful resources (like a suicide helpline). The list of features does not end here. These apps are advancing each day and are focused on providing a better platform to users and their growing needs.

A few popular apps doing such things are:

- **Woebot [5]** - One of the best known AI-powered mental health apps claims to solve gaps along the entire health care journey from symptom monitoring to episode management

- **Replika [6]** - The AI companion who cares, can let you create a human-like figure whom you can give a name and chat with.

- **Lyssn [7]** - Evaluate psychotherapy sessions and generates performance-based feedback using machine learning and analytics and help behavioral health care providers improve services and achieve better client outcomes.

Are we there yet? Are we sure?

There is a huge demand for mental health apps. We love going digital and technology has become a ubiquitous part of our lives. But, are we going in the right direction? Are we happy talking to a bot instead of a human? Would this not create distance between people (Different from the social distance COVID-19 created)? Wouldn't the time be near when we would not like to interact with people but instead talk to our favorite bots?

Not only this, how can we ensure that AI will help people and not harm them? AI is only as good as the data it is trained on. We still do not know what the gold standard for data is. Publicly available data like Reddit, Discord, Twitter, ReachOut, EHR, eRisk dataset of Early Detection of Signs of Depression [8] are great training sources but can also contain foul language, swear words, and phrases of self-harm and destruction [9]. So, the quality of data matters a lot in building a bot that can help people in uncertain times. Of course, there is room for regulation.

To let users benefit from the app, user engagement is important too. The more user engagement the better will be its performance as AI learns from data and the more you can gather the better you can benefit. So to make the bot perform better, how can we ensure daily user engagement?

Also, can we replace human healthcare professionals? The answer may be no for now but no one knows what the future holds for us. There is a lot of scope for improvement in this technology for now. Technology enthusiasts are eager to see what technologies like these can do if used in full potential. We are still not sure what the future holds for this space but surely this pandemic has created a boost in this domain. And, certainly, we will be going to see more advancement in this domain in the upcoming future.

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