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# THERAPY BY CHATBOT

The need for mental health support services in South Africa is dire, and during the course of the Covid-19 epidemic the prevalence of mental health distress only grew while the capacity to support patients stayed largely the same, especially in the public health sector. Simultaneously we have seen an explosion of technology based interventions that seek to help people with mental health and wellness support in a variety of ways. It has become time to bring the worlds of traditional treatment and these interventions closer together by exploring what these tools can do to support patients when traditional care is not always as available as it should be.

The ecosystem of technology supports for health and wellness cover areas from physical health and wellness, to tracking moods and other activities like taking medication, to journaling apps and all the way up to chatbots with a focus on mental

well-being. The reason for the rise in these sorts of technologies is varied, but things that contribute are:

- The growing demand for mental health services
- The technological advancements in the field that has made this possible
- The accessibility of these technologies
- The cost-effective nature of these technologies
- The ability of these technologies to overcome some of the traditional barriers associated with therapy

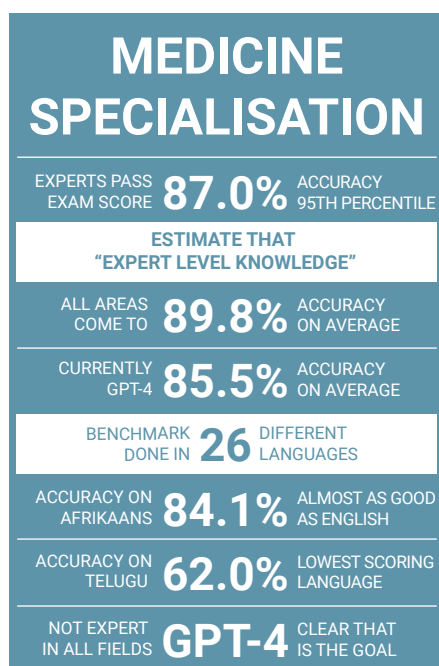
The conceptual history of chatbots really started in 1950 when Alan Turing put forth the concept of the Imitation Game - what would later be known as the Turing Test. In it, a person is presented with a console that has a keyboard and a monitor with which they can chat via text to two agents that are not visible to them, one a machine and the

other human. They would be given time to converse with both agents using natural language through this interface and be asked to judge which agent was the machine and which one human. If the judge could not tell the difference, then it was proposed that intelligence was achieved.

It may be surprising to learn that although this current wave of chatbots for mental health purposes is quite new, the first chatbot ever created was written in 1965 in the form of a Rogerian psychotherapist and was called ELIZA. It caused quite a sensation because even though its author claimed that there was no real intelligence in the chatbot, people still seemed to attribute much deeper meaning to the responses given and believed it was truly intelligent. This phenomenon came to be known as the ELIZA effect.

We have come quite a long way since ELIZA with some people feeling that the current generation

of chatbots started overcoming the original Turing test as early as 2014. There have been a number of incidents where people have been uncertain as to whether content they are seeing, whether it be in the form of text or even now in the form of images, is something that was created by a human or by a machine. Additionally, the level of intelligence (in as much as we understand the concept of intelligence) that is displayed by these artificial intelligences is growing at an incredible rate. The concept of what an “expert” is, is something that is being challenged and we will need to explore what it means for us in all of our respective fields as we see artificial intelligence encroaching. To show just how deeply this touches us, we need only look at the MMLU (Massive Multitask Language Understanding) benchmark that is used to test Large Language Models on their general and specific knowledge. In this benchmark 57 specialised areas are represented with just over 14,000 multiple choice questions with four possible answers. As such, one would expect someone to get at least 25% by just randomly guessing the answers. Based on tests done with unspecialised humans that have taken the test, the average accuracy obtained by them comes to 34.5%. With experts however in their own field this value becomes much higher.



When looking at the knowledge that is included in the medicine specialisation, the questions are taken from the US Medical Licensing Exam for which experts that pass the exam score an 87% accuracy at the 95th percentile. From the paper written on the test by the authors, they estimate that “expert level knowledge” in all areas should come to about 89.8% accuracy on average. Currently, GPT-4 is able to attain an average accuracy of 85.5% in all areas measured. Additionally, this benchmark was not only done in English, but in 26 different languages. The accuracy on Afrikaans was almost as good as English at 84.1%, but the lowest scoring language was Telugu where it only managed to obtain 62% accuracy. This means that we cannot yet claim GPT-4 is an expert in all fields, but it is clear that this is the goal.

What does this mean for us? It does not seem that artificial intelligence is likely to take all jobs that require knowledge and skills that are represented in natural language, but it is definitely going to impact these jobs. Practitioners that explore this new technology and understand how it can supplement their practice are more likely to be successful in future in knowing where these tools can help them and their patients, than those who simply ignore them or use them indiscriminately. What we need to do is explore tools that are available, evaluate them to see whether they are fit for purpose in the South African context, and use what is valuable to lighten the load on our existing ecosystem.

With this in mind, I would like to put forward four technology interventions that have potential, and could be explored in this way. These are:

- **Daylio:** A mood and activity tracker that allows one to write a journal, as well as capture custom activities and moods that allows for the most relevant data for the patient in question to be tracked.
- **Woebot:** a Chatbot that uses Cognitive Behavioural Therapy, Interpersonal Psychotherapy and Dialectical Behaviour

Therapy techniques along with natural language and artificial intelligence to create a safe space to explore negative emotions and find coping strategies. It also allows one to journal and track moods.

- **Replika:** a more general purpose chatbot that has some mental health activities integrated into it, but is more focussed on addressing loneliness as it tries to build a relationship with the user by learning about them over time.
- **Cass:** a chatbot that that is extensively trained on recorded interactions between patients and clinicians and attempts to replicate this experience. The approach taken by this tool is to integrate it into an existing support system to allow the chatbot to act as a first-line interaction with the patient, which then allows it to offer a triage service. This is not a tool that a patient just downloads, but instead is based on an enterprise relationship and integration into an organisation's wellness ecosystem.

Daylio and Woebot (recently only available in the US) are free apps that can be downloaded by a patient and used at no cost, Replica has a free and paid version (\$7.99/month or \$49.99/year), and Cass doesn't sell directly to patients and instead needs to be integrated into a practice.

These are not the only tools that are available, but what is becoming clear is that technology is constantly progressing, and with it comes new opportunities to supplement ones practice. Technology is not going to replace clinicians just yet, but will hopefully be able to take on the role of partner in care rather than competition.

Links to the above mentioned apps:  
<https://play.google.com/store/apps/details?id=net.daylio>  
<https://play.google.com/store/apps/details?id=ai.replika.app>  
<https://woebothealth.com/>  
<https://www.cass.ai/>

**References available on request.** MHM