

ARTIFICIAL INTELLIGENCE-BASED CHATBOT FOR MENTAL HEALTH

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ABSTRACT

A chatbot is a computer programme that analyses and comprehends human enquiries using machine learning and natural language processing techniques in order to provide intelligent and persuading responses. A chatbot is an AI-powered tool that simulates the behaviour of human conversation partners. intermediaries in a dialogue between the user and the machine. The chatbot therapist uses the cognitive behavioural therapy (CBT) approach to give regular conversations and encouragement for improved mental health to people who are struggling with mental illnesses (such anxiety, depression, or stress). By concentrating on a person's beliefs, attitudes, and imagination, CBT changes their way of thinking and acting. The majority of these treatments are frequently conveniently accessible and cost-free. Online conversations are frequently more accepting than in-person ones. Conversational agents like Flow, Wysa, Woebot, joy, and Talkspace are made available to the public sector. The use of chatbots is a crucial strategy for informing people about the options that technology provides and regularly maintaining user motivation. Artificial intelligence (AI)-powered mental health chatbots have become a promising resource for giving those who are struggling with their mental health access to fast help. Natural language processing techniques are used by these chatbots to carry on discussions, offer resources, and offer emotional support. The possible advantages and disadvantages of chatbots for mental health are examined in this abstract. It draws attention to their reachability, availability, and lack of judgement, which can aid in removing obstacles to obtaining assistance. It does, however, recognise the drawbacks of chatbots, including the lack of human empathy and the demand for human supervision.

Keyword: - Flow, Wysa, Woebot, joy, and Talkspace

1. ARTIFICIAL INTELLIGENCE-BASED CHATBOT FOR MENTAL HEALTH

The World Health Organisation estimates that 264 million people worldwide suffer from depression, which in the worst-case scenario frequently results in suicide, according to recent studies. The highest rates of stress and anxiety are found in those between the ages of 15 and 29, and there are many different reasons why depression occurs in this age group. Many people who experience mental illness continue to feel stress while not understanding how it affects their brain cells, which is a concern. Everyone should practise stress-relieving techniques. Another issue is that 76 to 85% of people in low- and middle-income countries do not have access to sufficient resources or trained medical workers. The national health systems struggle to meet the increasing demand for resources. For every 100,000 individuals, there are nine mental health specialists in wealthier countries, compared to just 0.1 in low-income ones. These people's lives could currently be saved by chatbots. All you need is network connectivity to connect to your virtual therapist. The fact that all knowledge on the internet is shared and that anyone can use its services is one of its largest benefits. similar to how a chatbot could compensate for a mental health professional's shortcomings. Even if they have access to health care, people may delay using it for a variety of reasons, such as thinking their emotions are too low to merit seeing a psychiatrist or being afraid of what other people would think. People will gain from not having to wait for an appointment because chatbots are always available. Instead of replacing human health professionals, these tools are meant to help them perform their jobs more efficiently. Chatbots are user-friendly and provide an interactive platform. Poor emotions can properly exist for people who are not depressed. day and require motivation to maintain their energy. To gain a good knowledge of their thoughts, these folks can also use the chatbot therapist. Obtaining the necessary mental health care for students may be difficult due to problems with availability,

accessibility, and cost. Studies show that utilising a chatbot therapist to treat depression is more effective and less expensive. As a result, there are many self-mental healthcare practises utilising chatbots for user encouragement and stress reduction. The chatbot therapist is the most innovative type of therapy. It has a number of parts that come together to form an efficient chatbot. After receiving input from the user, the chatbot analyses the data to identify the user's level of stress before providing helpful tips and self-help techniques. Natural language processing (NLP) is used by the system to recognise the user's mood and then show content in line with that mood. This study has examined the cognitive behavioural method used in chatbots as well as the conversational agents (chatbots) that are now on the market.

2. RELATED WORKS

There are a lot of studies and papers that recommend using chatbots for effective therapy. The various conversational bots that are currently accessible in the discipline of psychiatry and their function in the analysis, diagnosis, and treatment of mental illness. A World Health Organisation survey found that 29% of the 15,000 mental health applications have a mental health focus. Chatbots are a practical and efficient way to access mental health care through your device, or as some could say, "reduce barriers to therapy." These bots' primary advantage is convenience; you may get in touch with them whenever you need help. G. Cameron estimates that 28% of all illnesses worldwide are mental health issues, compared to other diseases. He claims that there is an expanding gap between the number of people who experience mental illness and the resources that the National Health Services (NHS) can give, leading providers to look for effective ways to provide mental healthcare. According to a Cara Curtis essay, depression-assistance robots may be the future of therapy. Numerous studies have demonstrated how technology works to improve people's mental health. Undoubtedly, technology is paying close attention to how it may help people who are struggling with their mental health. One such project is the "flow" app developed by Flow Neuroscience. The chatbot helps people with mental health difficulties as they wait to be seen by a doctor. Based on the most recent discoveries in neuroscience and psychology, the programme was created by a team of clinical psychologists in partnership with certain machine learning experts. The software is currently available on iOS, and soon it will also be on Android. While tracking mood data and providing individualised therapy based on behaviour, the digital therapist guides users through 18 sessions on how and why sleep, exercise, and nutrition are the three major pillars in recovering from mental illnesses including depression, stress, and anxiety. In order to introduce users to self-help methods, mood tracking tools, meditation films, and exercises, it engages them in daily chat. People are hesitant to discuss their conditions with others, according to Flow's co-founder Daniel Mansson, but with Flow there is no concern about being judged by anyone. While there are numerous apps available to aid with understanding mindfulness. According to flow's research, however, 24% of its clients had completely overcome their depression, and 41% felt that their symptoms had improved after having brain stimulation treatments for 6 weeks. One of the biggest difficulties is creating a conversational interface experience with a certain domain in mind. The chatbot user interface is a little complicated since interaction creates expectations, and in order to match these expectations, design patterns must be modified to adapt in different domains. It's essential to look at the product's design if you want to please your customers. The Stanford study found that by lowering students' fear and despair, chatbots can improve their moods. People's moods are surely improved by talking to them and emulating the core therapeutic technique. Woebot, a tool created by Alison Darcy, a lecturer at Stanford School of Medicine, using cognitive behavioural therapy CBT techniques to help users recognise and manage anxiety and depressed symptoms. People's ideas can be understood by observing the changing patterns of distorted negative thought.

3. METHODOLOGY

Positive thoughts, behaviours, and feelings are used to replace all the negative and harmful ones during cognitive behavioural therapy. Similar realities have been acknowledged in a number of philosophical traditions, particularly stoicism. The stoic philosopher Epictetus held that incorrect beliefs can be found and rejected through logic in order to prevent the development of negative emotions. This helped contemporary CBT procedures recognise the cognitive biases that fuel depression and anxiety. CBT was first introduced by Aaron Beck in cognitive therapy and later refined into CBT by Albert Ellis, who also developed the ABC approach and rational emotive behaviour therapy (EBT). People frequently believe that the circumstances, environment, or other people are to blame for how we feel, according to him. The ABC model was created to demonstrate this. A (antecedent) denotes the circumstance that triggers the reaction, and B (beliefs) denotes our actions or reactions are determined by our understanding of the situation and C (consequences). A component of cognitive behavioural therapy is the ABC

model. Therefore, CBT does not seek to replace any emotions or feelings; rather, it seeks to assist people in responding correctly. As for what specifically happens in CBT, the therapist would essentially focus on your ideas, feelings, and behaviour as well as the various ways they interact. Counselling therapy that uses CBT is strongly recommended because it is a reliable method for addressing a wide range of concerns and problems. Working with a CBT therapist will make you realise how collaborative the process is and how it's actually a team effort to look at the problems you deal with. You will have homework as part of CBT therapy, which some people may find difficult to accept or get used to. The only difference is that a good CBT therapist will give you some sort of homework assignment or action item to perform in between sessions, much like in school. CBT combines behavioural psychology with cognitive psychology. The following diagram illustrates the interrelationships between feelings, thoughts, and behavior.

4. PROPOSED SYSTEM

The proposed AI-based chatbot system for mental health seeks to offer individualised and accessible support to people dealing with mental health problems. The chatbot will use artificial intelligence methods to engage in conversations and provide pertinent information and advice, including machine learning and natural language processing. The following sections provide an overview of the main characteristics and features of the suggested system:

User Interface: The system will include a user-friendly interface where users may communicate with the chatbot, such as a mobile application or website. The user interface must be simple to use, visually appealing, and navigable.

Natural Language Processing (NLP): To comprehend and interpret user input, the chatbot will be given NLP capabilities. To offer relevant solutions and help, it will make use of tools like sentiment analysis, entity recognition, and context comprehension.

Initial Evaluation: Before starting the conversation, the chatbot will make a preliminary evaluation of the user's mental health. It will pose pertinent queries to learn more about symptoms, causes, and general wellbeing. The chatbot will be better able to grasp the user's wants as a result of this evaluation and can then adjust its responses.

Emotional Support and Coping Techniques: The chatbot will provide sympathetic and encouraging responses based on the user's input and evaluation. It will offer users evidence-based coping mechanisms, self-help methods, and psychoeducational resources to assist them in managing their mental health difficulties.

Referrals to Resources: The chatbot will have access to a vast database of mental health resources, including helplines, support groups, types of therapy, and self-help books. Based on the user's location and unique demands, it will offer pertinent referrals that will connect them to the right services.

Crisis Intervention: The system will be set up to spot and react to indications of a crisis or an impending hazard. The chatbot will prioritise user safety if it notices extreme anguish or suicidal thoughts and will either give the user emergency helpline numbers or advise them to call for help right away.

Personalization: The chatbot will make every effort to make the user experience unique. For individualised help and follow-up, it will recall prior chats, preferences, and individual progress. Personalization can increase interaction and create a feeling of intimacy with the chatbot.

Continuous Learning and Improvement: To continuously learn from user interactions and enhance its responses over time, the system will use machine learning techniques. This will make the chatbot's help delivery more precise, sympathetic, and efficient.

Privacy and data security will be given top priority in the suggested system. It will follow pertinent data protection laws, employ safe encryption techniques, and make sure that user information is anonymous and private.

Although the chatbot will work independently, it will be under the supervision of human mental health specialists. Assuring appropriateness of responses, ethical considerations, and addressing any limitations or potential threats, trained people will examine and oversee the chatbot's interactions. In general, the proposed AI mental health chatbot system seeks to deliver efficient, individualised, and accessible care to people in need. The chatbot can supplement

conventional mental health services, close care gaps, and offer help around-the-clock by fusing artificial intelligence technologies with knowledge of mental health.

5. CONCLUSIONS

Now that we've seen it, bots like Woebot, Wysa, and Joy could be very helpful to people who are suffering from mental diseases. Many people are still ignorant of the technology available to treat depression and the potential benefits of chatbots. Accessible at any time via an interface and an online connection, the chatbot is a terrific tool for everyone. The automated bot complies with the fundamental standards that must be met in order to safeguard user privacy, be supported by evidence, and ensure user safety. Chatbots that employ cognitive behavioural therapy (CBT) have surely helped to organise things by challenging their users to recognise emotions, distinguish between beneficial and harmful sensations, and comprehend how distorted beliefs contribute to negative feelings. An incredible advancement in healthcare is the chatbot therapist. Users will be encouraged to openly communicate their issues and feelings.

The creation and use of mental health chatbots in AI has showed a lot of promise and potential for helping those who are experiencing mental health problems. These chatbots engage in meaningful conversations, give resources, and offer emotional support using artificial intelligence and natural language processing techniques. Accessibility is one of the main benefits of mental health chatbots. A larger populace can access them because to the availability of numerous digital platforms, including websites, smartphone applications, and messaging services. Chatbots can respond quickly and are available around-the-clock, which is very helpful for those who might not have access to conventional mental health treatments or who are in emergency situations.

6. REFERENCES

- [1] In-depth: cognitive behavioural therapy, B. Martin, 2019.
- [2] Depression, chronic diseases, and declines in health: data from the World Health Surveys, Moussavi, S., Chatterji, S., Verdes, E., Tandon, A., Patel, V., and Ustun, B. *The Lancet*, 2007; 370(9590).
- [3] A. Matsumoto, T. Munakata, T. Inoue, T. Kamita, T. Ito, SAT Counselling Method-Based Chatbot System for Mental Healthcare, 2019.
- [4] Radziwill, N.M., and Benton, M.C.: Evaluating the quality of conversational AI and chatbots. arXiv preprint 1704.04579 was published in 2017.
- [5] Understanding Depression by Katherine, D. 2001 National Association for Mental Health publication, Mind.
- [6] K. Kratzmar, H. Tyroll, G. Pavarini, Is your smartphone a capable therapist? NeurOx young people's advisory panel, 2019, "Youths' Ethical Perspectives on the Use of Fully Automated Conversational Agents (Chatbots) in Mental Health Support"
- [7] C. Sankar, M. Germain, S. Zhang, Z. Lin, S. Subramanian, L.V. Serban, A chatbot with deep reinforcement learning, arXiv:1709.02349. Therapy chatbots are transforming psychology, K. Matthews, 2018, p. 13.
- [8] Text-based healthcare chatbots supporting patient and health professional teams: early findings from a randomised controlled trial on childhood obesity, Persuasive Embodied Agents for Behaviour Change (PEACH2017) Workshop, held in conjunction with the 17th International Conference on Intelligent Virtual Agents (IVA 2017).
- [9] Different Chatbots for Different Purposes: Towards a Typology of Chatbots to Understand Interaction Design, International Conference on Internet, 2018 - Springer, LNCS, number 11551, pages 145–156