Sentiment Analysis using Chatbot and Mental Health Tracker

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ABSTRACT

In today's world, the vast majority of the population suffers with intellectual illness, and lots of them are unaware of it. Some humans are too afraid to talk about mental illness due to the fact they don't know enough about it. However, humans should understand that our mental fitness is simply as crucial as our physical fitness. As a result, this mental health app is designed for such folks so that we can recognize and deal with their mental health issues. They might not need to worry about society and decorate their health on their own with the assistance of this application.

This application will ask the person some easy questions about their daily habits and assign them day by day assignments. It will additionally tune their progress at the dashboard and will keep a separate diagnosis page. To diagnose a person, it's going to ask a few questions with four answers and assign a mark to each choice. At the end of the questions, it's going to calculate the users' marks and display the results, in addition to suggesting a few vital steps. It is going to additionally include different elements which includes video games, music, and a chatbot to keep the users' minds lively and healthful.

Keywords : Sentiment Analysis, Mental Health Tracker, Chatbot

I. INTRODUCTION

According to the world health organization (WHO), "Mental health is a condition of well-being in which an individual can use his or her abilities, recover from daily routine stress, be productive, and contribute to the community". The term mental disorder is typically used to describe issues with one's intellectual fitness. Humor issues (e.g., despair), immoderate anxiety and stress, problems caused by drug and alcohol use (i.e., drug dependence), personal problems (e.g., bipolar), and delusional disorders are some examples of mental issues. Those mental diseases are interconnected and do not arise in isolation; this is, one problem is commonly followed with the presence of some other. Depression, as an example, might be accompanied by using excessive anxiety and/or suicidal ideation (a type of delusional disease). Some facts approximately depression are concerning: depression impacts more than 280 million human beings global (3.8% of the total population affected), and approximately 700,000 people die by suicide each year, making it the second maximum cause of mortality in the ones aged 15 to 29

[1]. The COVID-19 pandemic resulted in an additional estimate of 532 million cases of major depressive disorder worldwide (a growth of 27.6 percent). As a result, mental fitness troubles have affected a big share of the sector's populace.

Traditionally, the model for assisting people with mental disorders has been finished via face-to-face conferences with specialized health professionals, usually psychologists and psychiatrists, at a frequency that can vary relying on the assessment of the case, but is generally once a month to 3 times a week. However, because the number of individuals tormented by a mental situation continues to rise, it is crucial to address the project of lowering or, at least, slowing the rate of growth. One of the proposed alternatives is to apply diverse patient resource strategies to be had via mobile gadgets and software. Such methods may be used to gather mental fitness facts [2], prompt individuals to reply to questions about what they may be doing (or have accomplished) and/or experiencing (or have skilled) in their everyday habitual [3]. In order to undertake mental health interventions remotely and offer access to health resources, which include the construction of conversation channels with mental health experts [4] such answers are being developed in the context of the mobile health research (mHealth) [5].
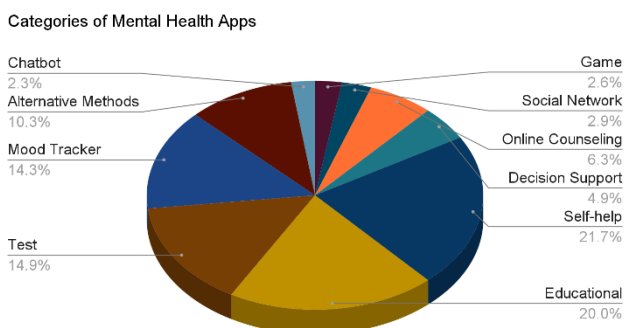
II. RELATED WORK

Fig 1. Categories of Mental Health Apps

There are currently 10,000 to 20,000 mental state apps [6] available, despite the fact that approximately 3% to 4% are thought to be evidence-based. the general public of those research had been performed in the recent years and assessed the feasibility and acceptability of mental state applications, as well as, in a few instances, their efficacy for a huge range of mental issues, together with post-traumatic stress disorders, depressive problems, bipolar problems, schizophrenia, or addictions.[7] Given the diversity and pace with which app-associated research is published, aggregated effects are required to evaluate the (as opposed to specific) software of mobile apps for mental state. Figure 1 illustrates the various categories into which mental fitness apps are classified.

Given the diversity and velocity with which app-related studies are posted, aggregated effects are required to evaluate the (instead of particular) application of mobile apps for mental state. Multiple systematic opinions of apps that concentrate on one or extra mental state issues are undertaken on a normal foundation, with wildly disparate findings. [8] This could be defined by the systematic assessment's selection criteria, with some most effective observing stand-on my own apps, others only observing auxiliary apps (apps provided on top of any other treatment) or apps offered with assistance (someone to be had for questions or to prompt its use), others considering both fashions together, and others nonetheless which include the whole lot and evaluating the models one after the other in several sub-analyses. In reality, a few experts argue that for psychological state difficulties, most effective supplementary apps or apps with preparation ought to be encouraged at the moment [9]. Given the rapid adoption of many of those programs, it's far crucial to exercise sessions, guide the usual evidence to be had, and therefore the impact sizes, if we need to continuously promote such apps for mental health conditions which include depression or anxiety. The aim of this systematic study turned into to consolidate

those findings and devise a higher method for developing an app that overcomes the restrictions of the programs below consideration. The Grading of pointers, evaluation, development, and evaluation (GRADE) system [10] became utilized to perceive the empirical quality of the proof. This method assesses the quality of evidence produced by systematic reviews primarily based on specific factors which includes pattern size, consistency of findings throughout studies, suited control for known confounding elements, no evidence of study bias, follow-up (if any), and effects which might be closely related to the effects sought. The GRADE system has been used efficiently for systematic evaluations of pre-post designs, randomized controlled trials (RCTs), correlational studies, experimental studies, and longitudinal investigations.

Even in advanced nations, the ratio of therapists, psychiatrists, psychiatric social workers, and mental fitness nurses to sufferers is 1 to 10,000 [11]. Because of the disparities within the system, the general public with mental health problems will by no means acquire the assistance they require. As a result, era companies have created artificial intelligence-based programs that aim to be the first line of care for a patient's mental health even as maintaining privacy and anonymity. Individual-targeted programmes had been developed to proactively monitor patients, to be ready to listen and talk at any time and from any area, and to provide activities that promote customers' well-being [12]. Chatbots, frequently referred to as "digital therapists," [13] are rising as viable complementary services to offer someone with resources and, in some cases, companionship. If the person feels unhappy at 2 a.m., they'll be unable to talk with their therapist. A chatbot, alternatively, is accessible 24 hours an afternoon, seven days per week, and is happy to converse with them whenever and anyplace they require a friendly ear.

Various industrial implementations of mental fitness chatbots consist of Wysa and Woebot. They may be available as Android and iOS applications. Wysa is a digital therapist powered via AI that engages the person in a pleasant communication making use of a mixture of cognitive behavioural therapy and mental fitness practises. It uses encrypted chats to safeguard the user's conversational data and lets in the person to employ a hidden identification. In contrast to Wysa, Woebot activates the person to check in before launching a brief user survey to better understand the user. It additionally employs Cognitive Behavioral therapy, a therapeutic method that aids inside the development of mental health. The software gives the person regular check-ins, brief pre-filled alternatives, and a gamified experience.

III. METHODS AND MATERIAL

Literature Search

Only systematic reviews with quantitative pooled statistics, published in complete textual content in English, and bringing up the usage of app generation for mental health issues had been included.

When multiple systematic assessment for a mental health problem was observed, we study all of them and selected the ones we desired to keep based on the subsequent standards: (a) We stored the evaluation with the biggest range of studies if maximum of the equal studies have been evaluated; and (b) We preferred the more current review with solely RCTs over an earlier review with numerous small out of control research. remedy hints and systematic evaluations without quantifiable records (e.g., qualitative) had been removed.

Grading of Recommendations, Assessment, Development, and Evaluation System

The GRADE system was used to evaluate the evidence's quality. The fine of systematic overview

evidence can be judged primarily based on a range of of factors, such as pattern length (the larger the higher, preferably over 1000), precision of results, directness of consequences (e.g., impact on mental health signs and symptoms [direct] vs impact on perceived stress [indirect]), homogeneity of effects throughout studies (i.e., consistency of consequences from one study to the next), and study layout (potential studies). The estimated effect length (the greater the value, the better) is used to determine the magnitude of the app's effect. Effect sizes have been supplied one by one from the first-class of evidence for every study. As a result, each characteristic of the GRADE system is assigned a point, with systematic critiques being categorized as very poor, poor to moderate, moderate to high, high, or very high–quality proof. We give both the quality of the evidence and the impact magnitude for every element of the model. We mentioned those who in comparison the applications with a manipulated condition and highlighted the consequences for stand-on my own apps versus apps with guidance, as systematic reviews.

Chatbot

We observe the sentiment evaluation [14] feature on this application with the help of a counselling chatbot, so that you can give conversational service for mental health care primarily based on emotion detection algorithms and the chat assistant platform. The chat assistant includes a chatbot which could use numerous messenger structures as an interface between the conversational carrier and the users. Users who want psychiatric counselling can type the session contents as text. The chatbot recognises the person's contemporary emotions and communicates the results to the conversational service. The service saved track of the effects in addition to the emotional highs and lows. We often reveal and diagnose the user's psychiatric concerns through such continuing interactions.

Following that, the service responds as it should be to the consumer's new inputs.

IV. RESULTS AND DISCUSSION

Due to this systematic review, we were able to carefully analyse the satisfactory evidence given by way of diverse analyses on the usage of apps for mental health issues. While we examined this research, we discovered that the results aren't firm, with low to moderate and mild quality evidence, in spite of the truth that medium outcomes are said. As a result, we found that higher excellent evidence samples ought to be large, extra homogeneous, and incorporate biases and observe-up. As a result, we are able to create an application so that it will have a GRADE system and a chatbot. These will be assisted by daily follow-ups, so as to contribute to a deeper understanding of the consumer and, as a result, improve the great outcomes supplied by means of our device. The information obtained from users could be retained and used to enhance the system. further, users could be categorized depending on their age and gender. The method of assessment might be deferred primarily based on these classes, and users can be provided with personalised pointers primarily based on the results for enhancing their health. The guidelines will consist of suitable measures to be taken by the user. The app may even act as a tracker [15] recording the everyday activities consisting of sleep, workout, meditation and advocate changes to their recurring to enhance their quality of life.

V. CONCLUSION

Mobile devices had been used within the mental health field in recent years as a part of clinical, mental, and preferred health services to aid inside the treatment and monitoring of Mental problems. Mobile technologies now not only enable continuous monitoring of someone's physiological situation, however additionally they assist within the creation

of a lifelong file of psychological, mental, and social health. As a result, the use of those technologies in fitness evaluations and interventions can decrease healthcare prices whilst enhancing access to health offerings. We delivered a chatbot software with a tracker that gives conversational mental healthcare offerings based totally on emotion reputation strategies, in addition to a talk assistant platform that consists of a context sensitive advanced natural language-based approach that offers personalized reaction technology in real time even as also allowing the consumer to document and evaluate daily activities. The methods allow for sensitive continuous commentary of the user's emotional fluctuations. As a result, our strategies will enhance the experience of humans in need of mental healthcare. Other mental illnesses might be used in future studies. We can improve the chatbot's ability to respond emotionally to the user.

VI. REFERENCES

[1] Institute of Health Metrics and Evaluation. Global Health Data Exchange (GHDx).(Accessed 1 May 2021).

[2] Artur Rocha, Mario Ricardo Henriques, Jo˜ao Correia Lopes, Rui Camacho, Michel Klein, Gabriele Modena, Pepijn Van de Ven, Elaine McGovern, Eric Tousset, Thibaut Gauthier, and Lisanne Warmerdam. Ict4depression: Service oriented architecture applied to the treatment of depression. In 2012 25th IEEE International Symposiumon Computer-Based Medical Systems (CBMS), 2012

[3] Ariel S. Teles, Francisco J. Silva, Artur Rocha, Jo ⍰ ˜ao Correia Lopes, Donal O'Sullivan, Pepijn Van de Ven, and Markus Endler. Towards situation-aware mobile applications in mental health. In 2016 IEEE 29th International Symposium on Computer-Based Medical Systems (CBMS), pages 349–354, 2016.

[4] Ariel Teles, Ivan Rodrigues, Davi Viana, Francisco Silva, Luciano Coutinho, Markus Endler, and Ricardo Rabˆelo. Mobile mental health: A review of applications for depression assistance. In 2019 IEEE 32nd International Symposium on Computer-Based Medical Systems (CBMS), 2019.

[5] Santosh Kumar, Wendy Nilsen, Misha Pavel, and Mani Srivastava. Mobile health: Revolutionizing healthcare through transdisciplinary research. Computer, 2013.

[6] Martha Neary, Stephen M. Schueller, State of the Field of Mental Health Apps, Cognitive and Behavioral Practice, Volume 25, Issue 4, 2018, ISSN 1077-7229

[7] Monney G, Penzenstadler L, Dupraz O, Etter JF, Khazaal Y. mHealth App for Cannabis Users: Satisfaction and Perceived Usefulness. Front Psychiatry. 2015 Aug 27;6:120. doi: 10.3389/fpsyt.2015.00120. PMID: 26379561; PMCID: PMC4550753.

[8] Firth J, Torous J, Nicholas J, Carney R, Pratap A, Rosenbaum S, Sarris J. The efficacy of smartphone-based mental health interventions for depressive symptoms: a meta-analysis of randomized controlled trials. World Psychiatry. 2017 Oct;16(3):287-298. doi: 10.1002/wps.20472. PMID: 28941113; PMCID: PMC5608852.

[9] Weisel KK, Fuhrmann LM, Berking M, Baumeister H, Cuijpers P, Ebert DD. Standalone smartphone apps for mental health-a systematic review and meta-analysis. NPJ Digit Med. 2019 Dec 2;2:118. doi: 10.1038/s41746-019-0188-8. PMID: 31815193; PMCID: PMC6889400.

[10] Grading quality of evidence and strength of recommendations BMJ 2004; 328 :1490 doi:10.1136/bmj.328.7454.1490

[11] Costello, KL, Floegel, D. "Predictive ads are not doctors": Mental health tracking and technology companies. Proc Assoc Inf Sci Technol. 2020; 57:e250. https://doi.org/10.1002/pra2.250

[12] K. Woodward et al., "Beyond Mobile Apps: a Survey of Technologies for Mental Well-being," in IEEE Transactions on Affective Computing, 2020, doi: 10.1109/TAFFC.2020.3015018.

[13] Gillian Cameron, David Cameron, Gavin Megaw, Raymond Bond, Maurice Mulvenna, Siobhan O'Neill, Cherie Armour, and Michael McTear. 2017. Towards a chatbot for digital counselling. In Proceedings of the 31st British Computer Society Human Computer Interaction Conference (HCI '17). BCS Learning & Development Ltd., Swindon, GBR, Article 24, 1–7. DOI:https://doi.org/10.14236/ewic/HCI2017.24

[14] Y. Bhangdia, R. Bhansali, N. Chaudhari, D. Chandnani and M. L. Dhore, "Speech Emotion Recognition and Sentiment Analysis based Therapist Bot," 2021 Third International Conference on Inventive Research in Computing Applications (ICIRCA), 2021, pp. 96-101, doi: 10.1109/ICIRCA51532.2021.9544671.

[15] Kunal Kislay "Chatbots In Mental Health. Friendly But Not Too Friendly"; 2020

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