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Resolution of Mental problem and health using Artificial Intelligence

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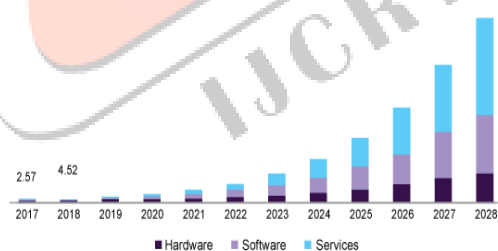
Abstract

With the sudden surge of Artificial intelligence and machine learning technologies, the world is getting digitalized, and many people are benefiting from it. Due to this many internet-based company using this technology and enhancing their products and services to target new consumers. Many companies are targeting many new sectors one of them is mental health, mental health is one of the most neglected part of our society and many people suffering from mental health-related problem but not taking cure or not able to afford the treatment due to huge cost. To counter this problem many new start-ups and big tech companies are emerging to make it more accessible and less destigmatize. As this technology becomes more developed and advanced, we would see a new age integration of psychiatrist and AI in future

Keywords: Artificial Intelligence, machine learning, psychiatrist

Introduction

Asia Pacific artificial intelligence market size, by solution, 2017 - 2028 (USD Billion)



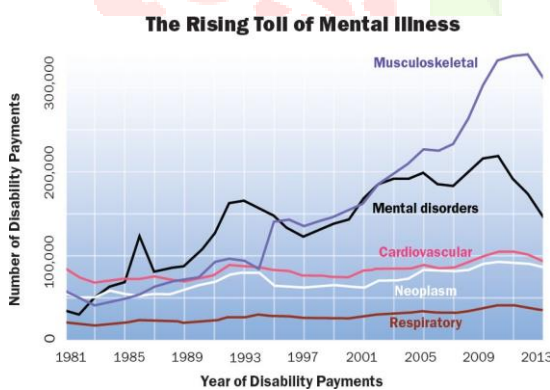
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In Artificial intelligence we focus on making intelligent machines by making computer programs smarter and making the process and the capability for superpowered thinking and data analysis to behave or perform human like task, The subset of artificial intelligence is machine learning, the term machine learning refers that computer program can learn from and adapt to new data new method or technique by its self without any guidance of humans, by the help of deep learning it get possible tackling huge amount of data example text, images and many more, Artificial intelligence is the upcoming major tech thing for healthcare, auto, finance, retail, manufacturing and many more. and many big tech companies are investing on it like Apple, Google, Oracle, IBM, and Microsoft.

As the global growth of AI is expanding very rapidly. We can see that the global artificial intelligence market size was valued at USD 62.35 billion in 2020 and is expected to expand at a compound annual growth rate (CAGR) of 40.2% from 2021 to 2028. Because of the continues research and innovation by the big tech companies and also accelerating AI accessibility to historical data set. AI also Revolutionize major health care sectors lick mental health.

Literature Review

Mental illnesses are of different types like depression, anxiety, schizophrenia, bipolar mood disorder, personality disorders, trauma, and eating disorders. And in world Mental health is one of the most neglected areas of health globally and there are several reason for that first is people associate it as a disgrace, second is people perception on mental health disorder is they oppose to call it as a actual illness, third High Costs, fourth is Lack of Mental Health Policies and the additional reason is outdated service model on mental illness treatment. But Nowadays mental health has become a global problem for all the people in the world. In today nearly 1 billion peoples live with mental illness and more than 75% of peoples with mental disorders do not receive any mental treatment. Every year nearly 3 million people die due to substance abuse. Every



40 seconds, a person dies by suicide. about 50% of mental health disorders start at the age of 14. It is estimated that over 160 million people need mental health support during any natural disaster, conflict, and other emergencies situation

According to the world health organization the covid-19 Pandemic disrupted the mental health sector and because of that 93% of countries worldwide halted critical mental health services but on the other side, the demand for mental health is increasing on covid period. Countries spend less than 2% on their mental health budget and it is

expected that in the next ten years depression will put more burden on nations than any other disease. Mental health is not only affecting health sector but also every different sector which overall affecting the economy of the country. So how to make Mental Health Care Accessible for everyone in the world the first thing we can do is that Educate people about mental illness second Provide Mental Health Care for People Between Jobs and businesses third Help people to connect between each other and avoid isolation. As we are seeing the big tech company and start-ups are investing heavily in artificial intelligence for research and innovation purposes they are also investing in mental health sector companies lick Lyra health, Pear Therapeutics, Ginger, Sonder Mind, Neuronitis, Modern Health, Quartet health and many more. In nowadays the accessibility of artificial intelligence becomes easy for most of the peoples who are using smartphones, laptops, and destocks. And on these devices, the user can use any kind of mental health services which have AI kind of a feature to know what kind of a mental problem person going through. And by which the service application can resolve his/her problem and keep them mentally fit.

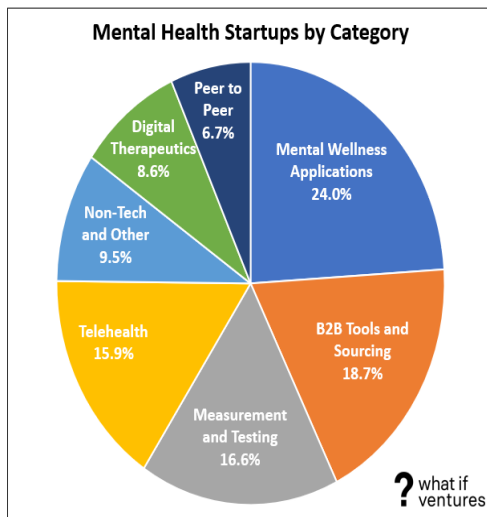
Methodology:

Early warning signs

In today's world advanced algorithm are capable of detecting signs of condition lick stress, disorder and depression in teens and adults by analyzing speech patterns and facial expression, So by this data mental and physical health provider can use this data to help there diagnose there patients more effectively there had been a study done by using algorithm which were get 100% successful to identify teen who are likely to develop psychosis by using algorithms using language analysis to monitor patients through there devices such as mobile phone and can update the doctor about the patient condition over the period of time this all data is collected by answering few daily questions online could help the app to detect early signs of trouble

Support for 24/7

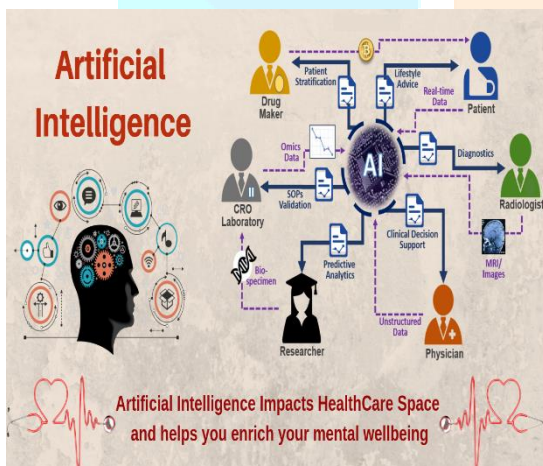
there are many app which have chatbot from which people can chat and talk and get low cost affordable treatment option this chat bots are always available and some people are more comfortable than an



anonymous human being, chatbots are still in experimental phase and there are many things to add on but still it is useful for the patients who are not able to access the treatment

Helping to destigmatize mental health issues

Stigma causes people to be ashamed for something that is out of their control. Stigma prevents people from seeking the help they need. Stigma is an unacceptable condition of pain that can be reduced by making mental health diagnosis and treatment more quantifiable and less subjective. It could ultimately



help destigmatize these conditions and improve outcomes. By using machine learning algorithms and this algorithm is more about evidence-based data and medical best practices than on patient subjective experience of distress, AI can help those people who live in rural areas where mental health facilities are not that much accessible or for those who can't afford regular visits to a therapist.

Data and privacy concern: -

In the health care sector, data is one of the most sensitive things, especially if we talk about mental health data, because still people are not that much open about their mental health with other people. AI in healthcare basically focuses on analyzing consumer healthcare data to improve outcomes by suggesting

diagnoses, reading medical device images, accelerating medical research and development, and more. Some people embrace these technologies for effective healthcare care facilities, but on the other hand, there have been high-profile cases involving misuse of personal data, such as the Facebook-Cambridge Analytica scandal. Similar events within healthcare could have serious consequences. Still, there is a lot to be done in the field of patient data; more rules and laws are needed to make it impossible for companies (pharmaceutical, social media, and other companies) to access the data of the patient without their permission.

Start-ups which are working on mental health

Lyra health: - It is a USA-based mental health start-up which helps to provide a frictionless experience for members, providers, and employers, by using data and technology, they connect employers to direct mental health providers without any inconvenience.

Spring Health: - It uses an AI-based solution to help the patient much faster. This start-up operates in an online mode; it uses machine learning to provide a better quality of treatment to the employees.

Pear Therapeutics: - It is also a USA-based E-health start-up. This start-up develops digital therapies to address a broad range of severe conditions like schizophrenia, addiction, pain, post-traumatic stress disorder, anxiety, depression, and sleep.

This platform combines pharmaceutical preparations with user-friendly, customizable, and scientifically proven software which provides better outcomes and good engagement.

Ginger: - This start-up provides on-demand behavioral health care to the employees when they are needed.

Modern Health: - It is a mental well-being start-up which helps the companies to reduce burnout and prevent turnover conditions in their company.

Sonder Mind: - It is a franchisor of community centers for behavioral health providers.

Neuronetics: - It has a therapy system which is non-invasive, non-systemic treatment for

depression uses a highly focused, pulsed magnetic field to stimulate function in targeted brain regions. NeuroStar is safe and effective.

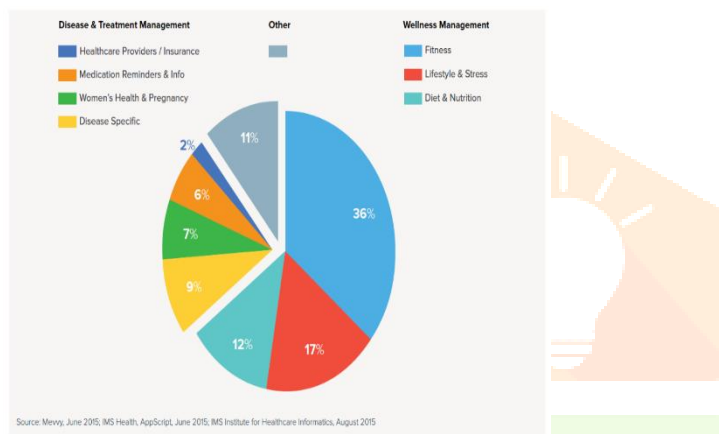
There are many more this kind of a start-up which are using modern day solution like ML, AI and many more such kind of technology to make mental health so accessible for every one and people are able to access treatment easily in a good price.

Pros and Cons of AI

AI has some of the advantages that can help everyone to treat themselves, but there are some limitations also.

Pros

Exhibit 2: mHealth Apps by Category 2015



- i. They are easier to access. As per WHO, proper healthcare facilities are not available in many poor countries. To reduce these problems, AI can help in providing efficient healthcare system to all people living in poor countries, as the AI related apps are also getting available now, so these can help them in accessing those facilities.

Features of AI

Here are some of the features that AI provides to users for their mental health treatment: -

- 1) They are available and are accessible anytime 24/7.
- 2) They can detect the behavior and problem of patients, collect data and try to build the therapeutic relationship with them.
- 3) They try to engage with the patients by collecting data continuously, helps to detect and work towards them

AI Bots and Apps for Mental Health illness (CBT)

these are the tools that helps people in their self-assessment in various problems like depression, anxiety, stress etc. and it also helps us in stress management.

Here below are the few examples of most popular AI technologies that helped people a lot:

a) Woebot

It was launched in the summer of 2017. It is a chatbot which was made to offer convenient care for those who are struggling with stress and depression.

It can share with your information and resources through videos and different exercises, based on what this app thinks you are needing at that time.

It can be used anonymously (without letting know to others) on iOS and we can chat with it in Facebook as well.

As we continue to chat with Woebot, it starts collecting data through Natural Language processing (NLP) and uses this information to get to know you better.

b) Wysa

Like woebot, it was also designed to meet the needs of people and to help them in getting rid of any kind of mental health illness. It uses Cognitive Behavioral Therapy (CBT) to help users to challenge and change their thoughts and behaviors.

It also includes Dialectical Behavioral Therapy (DBT), and encourages people in meditation practices and motivational interviewing by chat.

Like woebot, It can also be used anonymously, collects the data from you while chatting, and uses these information to get to you know more better and will help you.

- c) Tess
X2AI's Tess is described as "a psychological AI that administers highly personalized psycho-education and health-related reminders on demand."

It is a text-based messaging conversation that users can access through facebook messenger, SMS texting, web browsers, and smartphones.

- d) Youper
It is a chatbot that helps users to talk through their symptoms and behaviors.

The company calls it as "emotional health assistant" which provides personalized feedback based on what user has written in chat conversation with Youper.

At the beginning of a chat session, users can communicate what they need from Youper. For example, a user might want help managing chronic depression or may need tips for feeling less anxious at the moment. Then the bot culls through various psychological techniques (such as CBT) to provide the user with helpful guidance based on their needs and goals.

- e) Ellie
Ellie was developed by the University of Southern California's Institute for Creative Technologies as part of a project called SimSensei. Initially, it was designed to treat the patients who are facing depression and post-traumatic stress syndrome.

Conclusion and Future Scope of AI and Psychiatry: -

On across the worldwide random stratified sample of psychiatrists registered with Sermo, it is a global networking platform for verified and licensed physicians. We measure opinions of physicians that how likely that AI&ML would be able to replace fully the physicians and other medical staff, So, to measure that every psychiatrist has to perform 10 key psychiatric tasks, they measure the opinions about how many years from now such a capacity might emerge and they also measure the perceptions of psychiatrists whether AI&ML will benefit, or it can be risky.

Result of survey is that their were total 791 psychiatrists from 22 countries representing North America, South America, Europe and Asia-Pacific. Had respondent on this survey, So on the survey only 3.8% of respondents felt it was likely that future technology would make their jobs obsolete and only 17 % felt that future AI&ML was likely to replace a human clinician for providing empathetic care. According to Documenting and updating medical records 75 % and synthesizing information 54% were the two tasks where a majority predicted that AI/ML could fully replace human psychiatrists. Many US doctors were more uncertain that the benefits of AI would outweigh risks than male and around one in two psychiatrists did however predict that their job will be change by AI & ML.

The overall conclusion shows that how physicians think about AI/ML which in turn may help us better integrate technology and reskill doctors to enhance mental health care.

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