

MENTAL HEALTHCARE

ASSIGNMENT 8.3

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Introduction

- Mental health disorders are one of the leading health issues in the United States and it affects almost 10% of the population. This has significantly increased since the beginning of Covid19 pandemic and is not just seen in adults but children and young adults as well.
- Mental health awareness is another significant problem as lot of people are unaware of their problems until those turn into severe health issues like anxiety, depression, and other life-threatening risks.
- Also, many people don't know how to or from where to get help. Or they feel ashamed talking about their condition as that may impact their relationship both personally and professionally as well as their growth in life and at workplace.
- Another important thing to note is that in U.S there is a shortage in certified mental health professionals.
- Data Science/Artificial Intelligence can play an important part here by bridging some of the current gaps in Mental Healthcare sector.

Research Questions

1. With so much patient data now available digitally like health reports, lab reports, social media interactions, etc., different AI tools and techniques can analyze patient's data and flag physical and mental states. This can help in early detection and remedies.
2. Lot of people are hesitant to open in front of doctors and therapists because of stigma or fear of being judged.
People tend to trust a robot more since it won't judge, is unbiased and can provide instant answers to health-related questions. Several fitness gadgets are in market which can track your sleep, heart rate, blood pressure, etc. and can share that information through apps which can further evaluate and predict your overall health. I see some AI desktop/mobile apps in market for self-assessment and therapy which can be very useful if enhanced further and marketed properly.
3. Machine learning and Deep learning can provide greater accuracy in diagnosing mental health conditions and predicting patient outcomes. So, they can assist doctors and therapists in providing better treatment.
4. A major issue which I see with Data Science/AI in mental health sector is privacy. All sensitive information related to a particular person is available to an AI software and if misused or breached can cause greater damage physically, mentally, and financially.
5. Mental health is often overlooked which many times leads up to serious health issues. This is not specific to any age group as all are vulnerable and not specific to any particular location as it can happen anywhere from home, school, workplace, etc. So, self awareness as well as guidance, support and counselling is needed at the earliest possible stage.

Approach

I plan to focus most on awareness because that's what I think is lacking globally and specially more in third world nations. Timely treatment is the key to success.

Every person has a mobile device now with access to internet. With the help of Data Science/AI, mental health apps can be created which can help a person with self-assessment, morale boost with positive conversations, cognitive therapy, mind games and other related stuffs.

While doing initial research I found some AI apps already in the market which is a good sign but these can be enhanced further with additional features/capabilities.

Approach Outcome

Awareness is the key but there are other aspects as well like proper medical treatments and therapies for mental patients. Data Science can definitely help in these areas but my focus is more towards awareness.

So, my approach partially addresses this problem.

Datasets/Citations

- “COVID-19 and Mental Health Search Terms” dataset from Kaggle. <https://www.kaggle.com/datasets/luckybro/mental-health-search-term> The search interest of mental health related terms on Google before and after the outbreak of COVID-19 pandemic reveals how public's concern is affected by the pandemic, and its impact to mental health of people around the world.
- “Mental Health in Tech Survey” dataset from Kaggle <https://www.kaggle.com/datasets/osmi/mental-health-in-tech-survey> This dataset is from a 2014 survey that measures attitudes towards mental health and frequency of mental health disorders in the tech workplace.
- “Any Mental Illness in the Past Year among Adults Aged 18 or Older, by State: 2018-2019” dataset from SAMHDA.gov <https://pdas.samhsa.gov/saes/state> This dataset is maintained by ‘Substance Abuse & Mental Health Data Archive’ government agency and contains any type of mental health related issues in adults aged 18 and older for the year 2018-2019.

Required Libraries

```
library(ggplot2)
library(pastecs)
library(dplyr)
library(purrr)
library(stringr)
library(lm.beta)
library(tidyverse)
library(corrplot)
library(car)
theme_set(theme_minimal())
```

Plots and Tables

I believe histograms and box plots will be useful in visualizing the data. Regarding tables, I plan to explore ‘gt’ package as it looks simple yet powerful.
