IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

# A Statistical Analysis of Mental Health in India

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**Abstract**

It is no surprise that the state of mental health of a country, correlates positively with its economic growth. Projections show that India will suffer massive economic losses owing to mental health conditions. As of 2015, on a global level, over 322.48 million people worldwide suffer from some form of depressive disorder and as of 2017, more than 14 percent of the total population in India suffer from variations of mental disorders. The majority of this share includes older adult females in India.

**Key Words:** mental health, statistical analysis, economic growth, population, India.

## Introduction

Mental health of a person is measured by a high grade of affective disorder which results in major depression and different anxiety disorders. There are many conditions which are recognized as mental disorders including anxiety disorder, depressive disorder, mood disorder, and personality disorder. There are lots of mobile apps, smart devices like smartwatches, and smart bands which increase healthcare facilities in mobile mental healthcare systems. Personalized psychiatry also plays an important role in predicting bipolar disorder and improving diagnosis and optimized treatment. Most of the smart techniques are not pursued due to lack of resources especially in under developing countries.

## Depression and Bipolar Disorder

Bipolar disorder is also known as the worst form of depression. Bauer et al. Conducted a survey to check the bipolar disorder in adults. Data is collected from 187 older adults and 1021 younger adults with excluded missing observations. The survey contained 39 questions which took 20 minutes to complete. Older adults with bipolar disorder were addicted to the internet less regularly than the younger ones. As most of the healthcare services are available only online and most digital tools and devices are evolved, the survey has some limitations

that it did not contain any question about technology usage in older adults. There is a need for proper treatment of a disordered person. Mood of the patient is one of the parameters to detect his/her mental health. Another approach of personality assessment using machine learning algorithm that focused on other aspects like systematic fulfilment and argued to enhance the validity of machine learning (ML) approach. Coming with technological advancement in the medical field will promote personalized treatments. A lot of work has been done in the field of depression detection using social networks.

**Personality Disorder**

Dutifulness is a type of personality disorder in which patients are overstressed about the disease that is not actually much serious. People with this type of disorder tend to work hard to impress others. A survey was conducted to find the relationship between normal and dutifulness personalities. Other researchers are working on the most interesting and unique method of tremendous interest to check the personality of a person just by looking at the way he or she is using the mobile phone. This approach provides costeffective and questionnaire-free personality detection through mobile phone data that performs personality assessment without conducting any digital survey on social media. To perform all nine main aspects of the constructed validation in real time is not easy for the researchers. This examination, like several others, has limitations. This is just a sample that has implications for generalization when it is used in the nearrealtime scenario which may be tough for the researchers.

**Effects of Mental Health** Drug Abuse:

People voluntarily take drugs but most of them are addicted to them in order to get rid of all their problems and feel relaxed. Adderall divinorum, Snus, synthetic marijuana, and bath salts are the novel drugs. Opioid is a category of drug that includes the illegitimate drug heroin. Hasan et al. compared four machine learning algorithms: logistic regression, random forest, decision tree, and gradient boosting to predict the risk of opioid use disorder. Random forest is one of the best methods of classification in machine learning algorithms. It is found that in such types of situations random forest models outperform the other three algorithms specially for determining the features. There is another approach to predict drug abusers using the search history of the user. Perdue et al. predicted ratio of drug abusers by comparing Google trends data with monitoring the future (MTF) data; a well-structured study was made. It is concluded that Google trends and MTF data provided combined support for detecting drug abuse.

Suicide:

Suicide is very common in underdeveloped countries. According to researchers, someone dies because of suicide in every 40 seconds all over the world. There are some areas in the world where mental disorder and suicide statistics are relatively larger than other areas. Psychiatrists say that 90% of people who died by suicide faced a mental disorder. Electronic medical records and big data generate suicide through machine learning algorithm. Machine

learning algorithms can be used to predict suicides in depressed persons; it is hard to estimate how accurately it performs, but it may help a consultant for pretreating patients based on early prediction. Various studies depict the fact that there are a range of factors such as high level of antidepressant prescribing that caused such prevalence of illness. Some people started antidepressant medicine to overcome mental affliction. Cleland et al. explored three main factors, i.e., economic deprivation, depression prevalence, and antidepressant prescribing and their correlations.

## How Data Science Helps to Predict Mental Illness

Currently, there are numerous mobile clinical devices which are established in patients' personal body networks and medical devices. They receive and transmit massive amounts of heterogeneous fitness records to healthcare statistics structures for patient's evaluation. In this context, system learning and data mining strategies have become extremely crucial in many real-life problems. Many of those techniques were developed for health data processing and processing on cellular gadgets

## Prediction through Smart Devices

Various monitoring wearable devices are available that continuously capture the finer details of behaviors and provide important cues about fear and autism.

This information is helpful to recognize mental issues of the user of those devices. Victims were monitored continuously for a month. High level computation performed on the voice requires high complexity data as well as high computational power which leads to a huge pressure on the small chip. In order to overcome power issues, relatively low frequency was chosen. Yang et al. Invented an audio well-being device and conducted a survey in which participants have to speak more than 10 minutes in a quiet room.

## Role of social media to Predict Mental Illness

Constant mood of the patient is one of the parameters to detect his/her mental health. According to Lenhart, A. et al. studied almost four out of five internet users of socialmedia. In Table 3, researchers used twitter data to get online user review that helps the seeker to check out popularity of a particular service or purchase a product. In order to collect opinion of people on Airtel, they did analysis on it. Filter of the keyword is done using Filter by content and Filter by location. First of all, special character, URL, spam, and short words are removed from the tweets. Secondly, remaining words from the tweets are then tokenized and TF-IDF score is calculated for all the keywords. After cleaning of data, classification algorithm named K nearest neighbor and Naive Bayes algorithm were applied on the text in order to extract feature.

**Number of adults with anxiety disorders in select countries worldwide 2018, by gender**

It was estimated that in 2018 roughly 31 million men in the United States suffered from an anxiety disorder. The statistic illustrates the number of lifetime prevalent cases of anxiety disorders among adults in select countries worldwide in 2018, by gender.

**Mental disorders among adults India 2017 by classification**

In 2017, every seventh Indian was affected by some form of mental disorder in varying degrees. Among all the classifications of mental disorders in India, idiopathic developmental intellectual disability followed by depressive disorders, and anxiety disorders reflected the highest shares. By contrast, schizophrenia and eating disorders represented the lowest shares. In a recent survey conducted in 2019, over 70 percent of the Indian youth agreed that, today's youth suffer from more health and mental issues than ever before.

**Risk Factors**

The study was able to quantify to an extent, a small fraction of risk factors, that were attributed to certain mental disorders. For example, lead exposureas a risk factor accounted for almost 63 percent of all idiopathic developmental disorders among adults in India in 2017.

**Percentage of world population with select mental health disorders as of 2019**

This statistic depicts the percentage of the global population with select mental health and substance use disorders as of 2019. According to the data, almost four percent of the total global population suffered from an anxiety disorder.

**Leading health problems worldwide 2021**

Perhaps unsurprisingly, around 70 percent of survey respondents from 30 different countries around the world stated that COVID-19 was the biggest
health problem facing their country in 2021. Other health problems reported by respondents included cancer, mental health, and stress.

**The COVID-19 pandemic**

The COVID-19 pandemic has impacted almost every country in the world and has been the biggest global health crisis in recent history. It has resulted in hundreds of millions of cases and millions of deaths, causing unprecedented disruption in health care systems. Lockdowns imposed in many countries to halt the spread of the virus also resulted in a rise of mental health issues as feelings of stress, isolation, and hopelessness arose. However, vaccines to combat the virus were developed at record speed and many contries have now vaccinated large shares of their population.

## Mental health issues

One side effect of the COVID-19 pandemic has been a focus on mental health around the world. The two most common mental health issues worldwide are anxiety disorders and depression. In 2019, it was estimated that around four percent of the global population had an anxiety disorder, while 3.59 percent suffered from depression. Rates of depression are higher among females than males, with some 4.3 percent of females suffering from depression, compared to 2.9 percent of men. However, rates of suicide in most countries are higher among men than women. One positive outcome of the COVID-19 pandemic and the spotlight it shined on mental health may be a decrease in stigma surrounding mental health issues and seeking help for such issues. This would be a positive development as many people around the world do not or cannot receive the necessary treatment they need for their mental health.

## Risk factors contributing to mental disorders among female adults India 2017

In 2017, the highest share of risk factors contributing to mental disorders among adult females in India were those associated with lead exposure, with 61.7 percent contributing to idiopathic developmental intellectual disabilities. By contrast, the lowest share of risk factors contributing to depressive disorders were those relative to bullying victimization with three percent.

## Risk factors contributing to mental disorders among male adults India 2017

In 2017, the highest share of risk factors contributing to mental disorders among adult males in India were those associated with lead exposure with 63.8 percent contributing to idiopathic developmental intellectual disability. By contrast, the lowest share of risk factors contributing to depressive disorders were those relative to bullying victimization with 3.8 percent.

## Review of literature

There are a lot of mental disorders like bipolar one, depression, and different forms of anxieties. Bauer et al. conducted a paper-based survey in which 1222 patients from 17 countries were participated to detect bipolar disorder in adults. This survey was translated into 12 different languages with some limitation that it did not contain any question about technology usage in older adults. According to Bauer et al., digital treatment is not suitable for the older adults with bipolar disorder.

Researchers are working on the most interesting and unique method of tremendous interest to check the personality of a person just by looking at the way he or she is using the mobile phone. De Montjoye, collected dataset from US Research University and created a framework that analysed phone call and text messages to check the personality of the user. Participants who did 300 calls or text per year failed to complete personality measures. They choose optimal sample size that is 69 with mean age = 30.4, S. D. =6.1, and 1 missing value. Similarly, Bleidorn and Hopwood adopted a comprehensive machine learning approach to test the personality of the user using social media and digital records. Main 9

recommendations for how to amalgamate machine learning techniques provided by the researcher enhance the big five of the personality assessments. Focusing on minor details of the user comprehends andvalidates the result. Digital mental health has been revolutionized and its innovations are growing at a high rate. The National Health Service (NHS) has recognized its importance in mental healthcare and is looking for innovations to provide services at low cost. Hill et al. presented a study of challenges and considerations in innovations in digital mental healthcare. They also suggested collaboration between clinicians, industry workers, and service users so that these challenges can be overcome and successful innovations of e-therapies and digital apps can be developed. There are lots of mobile apps, smart devices like smartwatches, smart bands, and shirts which increase healthcare facilities in the mobile healthcare system. A variety of wearable sensors have been developing to deal with both physical and social interactions practically. Combining artificial intelligence with healthcare systems extends the healthcare facilities up to the next level. Dimitrovconducted a systematic survey on mobile internet of things in the devices which allow business to emerge, spread productivity improvements, lock down the cost, and intensify customer experience and change in a positive way. Similarly, Monteith et al. performed a paper-based survey on clinical data mining to analyse different data sources to get psychiatry data and optimized precedence opportunities for psychiatry

## Conclusion:

We discussed different types of mental disorders and their reasonable, affordable, and possible solution to enhance the mental healthcare facilities. Currently, the digital mental health revolution is amplifying beyond the pace of scientific evaluation and it is very clear that clinical communities need to catch up. Various smart healthcare systems and devices developed that reduce the death rate of mental patients and avert the patient to associate in any illegal activities by early prediction. Social media is one of the best sources of data gathering as the mood of the user also reveals his/her psychological behavior. In this survey, various advances in data science and its impact on the smart healthcare system are points of consideration. It is concluded that there is a need for a cost-effective way to predict intellectual condition instead of grabbing costly devices. Twitter data is utilized for the saved and live tweets accessible through application program interface (API).

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