Predictive Analysis for Early Intervention in Mental Healthcare

Rashi Agarwal, Sambhav Singh

Department of Computer Science and Engineering, New Horizon College of Engineering. Bengaluru, Karnataka, India

ABSTRACT

Big data is no longer about data in databases. Out of everyone you know. at least one out of four have serious mental health illness. Three out of every four that develop mental illnesses have their onset before the age 25. Given that these illnesses begin early and last for many years, its importan: to get the diagnosis right. Improving the current mental health system by using historical and some current patiert information and applying a variety of statistical techniques to come up with a scoring system which will give us valuable and reliable information for managing patients. This will not only improve life but also save lives. This paper digs deeper into how predictive analysis can help in advancement of mental healthcare in several stages. Such as, early detection and prevention, personalized treatment and intervention, suicide prevention, resource allocation, outcome prediction and avoiding relapse.

Keywords: Mental Healthcare. Early prevention, Predictive analysis, big data

I. INTRODUCTION

Big Data is considered to offer potential solutions to public and private organizations, however, still not much is known about the outcome of the practical use of Big Data in different types of organizations.

In recent years, healthcare management worldwide has been changed from a disease-centered model to a patient-centered model.

The potential of predictive analysis using big data for improving detection and management of mental illness has a vast scope. We need to do a comprehensive review on this approach to identify individuals at risk of mental health problems especially at low- and middle-income countries. A thorough plan needs to be laid out for places where the stigma still exists and there is also low availability for professional help. Even though the current technology is rapidly making progress, users may sti II face privacy concerns, self-stigma, denial about whether they need help or not. There is also lack of human interaction while developing technology for mental healthcare.

Mental health refers not just to mental illness, mental problems, and mental disorders, but also includes states of mental wellness. emotional resilience and psychosocial wellbeing. Psychosocial wellbeing is the interplay between social and psychological conditions that shape human welfare: a broad term which encompasses the states of being mentally healthy, experiencing mental problems, and mental illness.

Following discussed strategies are in aim of developing a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to contribute to her or his community."

II. PREDICTIVE ANALYTICS

Predictive Analytics is a subset of data mining which involves the prediction of probabilities. statistics and trends observed in the future. At the centre of this entire system is a variable called a predictor which is measured using various algorithms and techniques against patterns and past data for individual objects or entire datasets to predict the future behaviour of said data. A dataset could have multiple such variables each of whose results can.

Model development: Statistical or machine learning models are trained using historical data. These models learn patterns and relationships in the data to make predictions. Common techniques used in predictive analysis include regression analysis, decision trees. random forests, neural networks, and support vector machines.

Model evaluation and validation: The developed model is evaluated using validation techniques to assess its accuracy and generalization capabilities. This involves testing the model on new data that was not used during training and comparing the predicted outcomes with the actual outcomes.

Prediction and interpretation: Once the model is validated, it can be used to make predictions on new, unseen data. The predictions can be interpreted and used to infonn decision-making or future planning.

III. EMPHASIZE PRIMARY PREVENTION

What is the probability that you need immediate treatment? What are the required diagnostic tests you need to take? We have the data and the technology but we need mental health professionals and people to go on this journey with us. Often many patients die due to medical errors, prescription errors, communication errors, etc. Patients think they always need diagnostic tests which is not always true.

A.   Reduce Healthcare Costs

Often clinics require blood tests, scans, and various procedures just to identify the problem. Finding a small spot in the pancreas takes up to six weeks. Before scans it's often confused with indigestion, cancer, or stress. Three completely different. life altering problems for which different diagnosis is required. Stress doesn't even appear on the suggested list of scans. Imagine the mental tension a patient goes through just waiting for these results. the amount of time and money invested.

B.   Prevent Complications

Here, predictive tools could help patients better understand their illness and help their families plan for different clinical courses. Clinicians do not perform well when trying to predict which patients are at risk of suicide, and so better tools for this have the potential to fill a clinical gap and save lives. Simply knowing a patients prognosis does not necessarily lead to being able to help them manage their illness. For this, an optimal patient management strategy must be selected.

C.   Improve Quality

Promotion, prevention and early intervention strategies may produce the greatest impact on people's health and well-being. Screening strategies and early detection interventions may allow for more effective healthcare pathways, by taking action long before health problems worsen or by preventing their onset They also allow for a more personalized care. Young people are very reluctant to seek help and hence create barriers for themselves in terms of seeking help. They are seen self· doubting their problems, whether or not they're just overreacting.

They are further unsure about informing their parents and sharing the problem, or burden them with the expensive cost of professional help. It is almost impossible to reach out for professional help, as the individual suffering from mental illness find day to day tasks difficult to do, getting out of bed and waiting better for themselves is their furthest thought of action.

D.   Few Examples

Project Big Life is one such application which measures the users' daily activity and calculates the life expectancy based on their record of behaviour. Tt then suggests certain changes you can make in your life to increase life expectancy and as a bonus feature, it has been designed 10 recognise areas of concern by evaluating the person's daily mood and behavioural changes. This application in a way, is like a self-driving car. Applications like these, compare millions of other people and make recommendation based on the users' track records against ocher people around the world who are similar to them.

IV. CONCLUSION

We need to ensure that digital mental health interventions are accessible, effective, and ethical. Big data has the potential to make the necessary changes in the healthcare system as discussed in this paper. Through the power of doctors and technology. we can improve patient outcomes. As well as provide personalised solutions. Predictive analytics can intervene earlier, prevent complications, and reduce healthcare costs. Psychiatrist diagnosis are reliable but not valid. Mental health disorders are majorly stigmatised, which is a major barrier in their recovery, as quite often they blame themselves or the society for these illnesses. Through predictive analytics, patients can truly know about their illness and take personalised treatments.

V. REFERENCES

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