Chapter 11
Mental Health Monitoring in the Digital Age: A Comprehensive Analysis

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ABSTRACT

Social media has become a significant factor in the development of mental diseases, with the potential to significantly impact people's lives. This study explores the use of computational approaches and deep learning models to identify linguistic indicators suggestive of mental diseases such as depression, anorexia, and self-harm. The study also highlights the complex relationship between emotions and the underlying causes of mental diseases, emphasizing the need for understanding emotional triggers. The research demonstrates the effectiveness of machine learning models in detecting anxiety and depression on websites like Twitter, Facebook, and Reddit, particularly during the COVID-19 pandemic. The study highlights the potential of data mining techniques for automating the diagnosis of Social Network Mental Disorders among social media users, aiming to improve lives and address the rising incidence of mental illnesses in society.

DOI: 10.4018/979-8-3693-2359-5.ch011

1. INTRODUCTION

Mental illness is a health disorder which affects an individual's opinions, feelings, and behaviours. Presently, mental diseases are one of the most significant aspects of the public medical condition and this continues to be a major cause of disability and poor health around the world. Depression, Anxiety disorder, eating disorder, Addiction behaviours, ASD, and other psychoses are some of the most frequent mental illnesses. According to the report of WHO, one-eighth of people suffer from one or more mental illnesses, which places a significant financial burden on the government's authorities. Additionally, the COVID-19 pandemic has increased the suffering of people as well as the authorities (Kim et al., 2020). The judgment that is associated with mental illness and lack of knowledge about mental health assessments prevent most affected people with mental illnesses from receiving effectual treatment and diagnosis, even though treatments and efficacious preventive measures are available. This leads to early identification of mental illness which helps in the treatment of the condition as well as preventing it from getting worse. Due to exponential growth in recent years of social platform users, it has set off a key basis of data. The usage of social media platforms like x(Twitter), LinkedIn, Instagram, and Facebook to express views as well as sentiments is growing progressively popular, particularly among young people. This leads to the growth of study interest in detecting mental illness through analysis of textual content generated by users in their social media posts. Nowadays, social media sites like X(Twitter), Facebook, Instagram, and Reddit, offer opportunities for communication with a wide range of people. Social networks also have negative aspects that can be harmful to society as well as an individual. Depression as well as suicide are mental illnesses that can be treated, and the risk of suicide can be reduced. Suicide is a deliberate act that ends a person's life.

In this study, with the centre on three detailed illnesses anorexia, depression, and self-harm we make several contributions to the research on the automatic finding of mental illnesses at different levels. To this end, we investigate the use of machine learning techniques to detect mental illnesses from writing data on social media platforms and compare them with different designs, including ranked attention transformers and networks. We develop models as shown in Figure 1 for the automated calculation of illnesses using social media platform data and concurrently measure their efficiency. We finally move beyond the static approach and suggest this, to fully comprehend the signs and symptoms of mental illnesses, we should adopt a dynamical perspective that considers how symptoms change over time, particularly how emotions change in connection to cognitive styles.

Recent advances in natural language processing (NLP) have made it possible to perform tasks like analyzing emotions, identifying rumours, and screening for mental health on social media data more easily. The increasing fascination with investigating novel techniques for the detection of mental disorders is explained by developments in natural language processing technologies and deep learning models (Tariq et al., 2019). For instance, frameworks for deep learning enable models to autonomously acquire features, eliminating the necessity for laborious feature engineering, and replacing feature Methods rooted in engineering, like CNN and RNN. Additionally, When utilized with datasets related to mental healthcare, PLMs like BERT, RoBERTa, and Mental BERT have demonstrated competitive performance in detecting mental illnesses, showcasing their potential value.