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Advancements in Artificial Intelligence for Predicting Mental Disorders

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Abstract. Mental health issue is one of the main concern worldwide and COVID19 pandemic further exaggerating the issue by simply increasing anxiety and depression among people. In traditional diagnostic systems mostly in developing countries lack of professionals and Diagnostic subjectivity are major concerns. The review provides a brief introduction and analysis of machine learning and deep learning algorithms in the early detection, treatment personalization and outcome monitoring for mental health identification. The review primarily focuses on four type of issues bipolar disorder, PTSD schizophrenia, depression, and anxiety and provides in depth analysis of these disorders. The review also provides the assessment matrices like AUC, specificity, accuracy and sensitivity of various techniques defined under each disorder. The review also provides the various databases that has been used over years in the identification of the disorders in different forms including neuroimaging (MRI, DTI), physiological (EEG, heart rate), electronic health records (EHRs), and social media-based textual datasets. In addition to suggesting future research areas for reliable and therapeutically applicable AI systems, the review distinctively identifies limitations in interpretability, data integration, and ethical application. ML and DL can greatly increase diagnosis accuracy and accessibility in the provision of mental healthcare globally by tackling these issues.

Keywords: Mental Health Disorders · Machine Learning and Deep Learning · Early Detection and Diagnosis · Multimodal Healthcare Data · Ethical and Explainable AI

1 Introduction

Mental health is a worldwide problem owing to the rising incidence of mental health disorders globally. In the initial year of the COVID-19 epidemic, instances