

ABSTRACT

Mental disorders are a global health issue that affect an individual's thoughts, emotions, and behavior, leading to a decreased quality of life for those affected. The diagnosis of mental disorders is often complex because a single patient may experience more than one disorder simultaneously. A method capable of handling multiple labels or a multi-label diagnosis for a single patient is necessary. Multi-label classification is an appropriate method for addressing this issue, as it can predict multiple labels simultaneously and assist in the medical field to identify the types of mental disorders based on features in the patient's medical records. This study applies the Multi-Label K-Nearest Neighbor algorithm to classify patients with mental disorders and evaluate its performance. The Multi-Label K-Nearest Neighbor algorithm has a simple, efficient, and flexible approach to handle multi-label data by considering Bayesian probability and the Maximum A Posteriori rule. The dataset used is from the medical records of mental disorder patients at Yaba Psychiatric Hospital, covering five diagnostic labels such as Insomnia, Schizophrenia, Vascular Dementia, Attention Deficit Hyperactivity Disorder, and Bipolar. The dissimilarity measure between data points is calculated using the Gower distance due to the dataset containing categorical variables. The Gower distance calculates the dissimilarity value for each variable according to the scale of measurement of the variable. The model is tested with several values of k to determine the best classification performance. The results show that $k = 9$ provides the best performance with the smallest hamming loss compared to other values of k . The performance evaluation on the test data with $k = 9$ resulted in a hamming loss of 25.7%, precision micro of 82.2%, precision macro of 78.8%, recall micro of 72%, recall macro of 65.8%, f1-score micro of 76.7%, and f1-score macro of 70.7%.

Keywords: Mental Disorders, Multi-Label Classification, Multi-Label K-Nearest Neighbor, Gower Distance