

# Anxiety Depression and Stress Prediction among College Students using Machine Learning Algorithms

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**Abstract:** *The prevalence of mental health issues, specifically anxiety, depression, and stress, among college students has become a growing concern. Identifying early signs and risk factors is crucial for timely intervention and support. This research aims to develop a predictive model using machine learning algorithms to forecast anxiety, depression, and stress levels among college students based on various input features. Data will be collected through surveys, incorporating a range of demographic, academic, and lifestyle factors. The dataset will be preprocessed to handle missing values, normalize variables, and ensure compatibility with machine learning algorithms. Feature engineering techniques will be applied to extract relevant patterns and relationships from the data. Several machine learning algorithms, including but not limited to Decision Trees, Random Forest, Support Vector Machines, and Neural Networks, will be employed to build predictive models. The models will be trained on a portion of the dataset and validated using another portion to assess their accuracy, sensitivity, and specificity.*

*The study aims to explore the effectiveness of different algorithms in predicting mental health outcomes and to identify the most influential features contributing to these predictions. Additionally, an interpretable model will be pursued to enhance the understanding of the relationships between input features and mental health indicators. The ultimate goal is to develop a reliable and practical tool that can assist universities and mental health professionals in identifying at-risk students early on, enabling targeted interventions and support services. This research contributes to the growing field of digital mental health by leveraging machine learning techniques to address the pressing issue of mental health challenges among college students.*

**Keywords:** Mental Health, Anxiety, Depression Stress, College Students, Early Intervention, Predictive Modeling Machine Learning Algorithms, Data Collection, Surveys, Demographic Factors

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