

# Mental Health Analysis of International Students Using Machine Learning Techniques

## Introduction

This study focuses on the mental health challenges faced by international students, including academic stress, financial difficulties, homesickness, loneliness, and cultural adjustment issues. It explores demographic, cultural, and psychosocial factors influencing mental health while leveraging machine learning models to predict depression among international students in the United Kingdom. Data was collected through surveys and existing datasets, emphasizing the role of advanced analytics in addressing mental health concerns.

## Key Findings

### 1. Prevalence of Mental Health Issues:

- Financial difficulties, academic stress, homesickness, and loneliness emerged as key factors affecting international students' mental health.
- Students aged 21–30, females, and unmarried students were at a higher risk of depression and anxiety.

### 2. Cultural Adjustment:

- Students in the process of adapting to a new culture reported lower levels of depression and anxiety compared to those struggling with cultural shock.

### 3. English Proficiency:

- Surprisingly, English language skills were not significant predictors of mental health outcomes, suggesting broader factors play a more critical role.

### 4. Prediction Models:

- Four machine learning algorithms were employed: Random Forest, Logistic Regression, Decision Tree, and K-Nearest Neighbors (KNN).
- The Random Forest model demonstrated the highest accuracy (65%) and the best Area Under the Curve (AUC) value (84%) among the tested algorithms.

### 5. Significant Predictors of Depression:

- Key predictors identified included social connectedness, acculturative stress, homesickness, perceived discrimination, cultural shock, fear, perceived hatred, and guilt.
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## Implications

The study highlights the potential of machine learning models in identifying at-risk students and facilitating early interventions. Institutions can leverage these findings to design targeted mental health support systems, focusing on the most vulnerable demographic groups and addressing specific cultural and psychosocial factors.

## Recommendations

- Implement tailored support programs to mitigate financial and academic stress.
- Facilitate cultural adaptation processes through orientation programs and peer mentoring.

- Employ predictive analytics to identify at-risk students and provide timely interventions.
- Expand research to include larger datasets for more robust and generalizable insights.
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**Reference:** Rahman, M. A., & Kohli, T. (2024). Mental health analysis of international students using machine learning techniques. *PLoS ONE*, 19(6), e0304132. <https://doi.org/10.1371/journal.pone.0304132>