U MIND: A PILOT STUDY OF SELF REPORTED WELLBEING ITEMS AND MACHINE LEARNING FOR FLAGGING ELEVATED MENTAL HEALTH RISK AMONG SRI LANKAN UNDERGRADUATES

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Abstract

Early recognition of distress among undergraduates is difficult where counselling capacity is limited, and brief digital screening aids have been proposed. The main objective of this pilot study was to examine whether a short set of self reported wellbeing items could flag Sri Lankan undergraduates who rate their mental health as moderate or poor, using machine learning within a prototype web application, U Mind. An online questionnaire in 2026 yielded 49 analysable undergraduates from Sri Lankan universities, after excluding non students and postgraduate respondents. Inputs were age, sleep duration and five items on academic pressure, mental exhaustion, hopelessness, anxiety and social isolation. The label was a separate self rated question, not built from the inputs. Logistic regression, random forest, support vector machine and a depth limited decision tree were compared with a majority class baseline. Performance was estimated using 50 repeats of stratified five fold cross validation, with scaling fitted inside training folds and no oversampling. Accuracy, sensitivity, specificity, precision, F1 score and area under the curve (AUC) were reported, with Wilson 95% confidence intervals for sensitivity and specificity. No model outperformed the baseline accuracy of 0.57. Sensitivity ranged from 0.10 (95% CI 0.03 to 0.29) for the support vector machine to 0.43 (0.25 to 0.64) for the decision tree, specificity from 0.61 to 0.79, and AUC from 0.40 to 0.56. The items did not reliably distinguish good from moderate or poor self rated mental health. The findings are preliminary, based on self reported labels from a small sample of Sri Lankan undergraduates from five institutions, so they cannot be generalised to all Sri Lankan undergraduates, and the prototype is a screening aid concept, not a diagnostic tool. Larger samples, validated instruments such as PHQ 9 and GAD 7, and clinical validation are needed before any practical use.

Keywords: Mental health screening, Machine learning, Undergraduates, Sri Lanka, Sensitivity and specificity