

A STUDY ON THE IMPACT OF PSYCHOLOGICAL DISTRESS AND PERSONALITY TRAITS ON SMARTPHONE ADDICTION AMONG YOUNG ADULTS IN SRI LANKA USING MACHINE LEARNING

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In today's digital society, reliance on smartphones has escalated to the point where it poses significant risk to mental well-being, particularly among young adults. This study explores how psychological distress and personality traits influence patterns of smartphone addiction in Sri Lanka, focusing on individuals aged between 18 and 35 years. The objective was twofold: to identify the relationship between mental health factors and addictive behaviours; and to evaluate the usefulness of machine learning techniques for early risk detection. A cohort of 300 participants was surveyed using three validated instruments: the Ten-Item Personality Inventory (TIPI), the Smartphone Addiction Scale - Short Version (SAS-SV), and the Depression Anxiety Stress Scales (DASS-21). Data preparation included cleaning, normalisation, and feature engineering prior to model development. Several supervised algorithms were trained, including logistic regression, decision tree, support vector machine (SVM), random forest, XGBoost, and feedforward neural networks. Performance was evaluated through accuracy, recall, precision, F1-score, and area under the curve (AUC). Among the tested models, XGBoost demonstrated the strongest predictive capability, with an AUC of 0.99. Psychological outcomes revealed that addicted participants exhibited notably higher levels of stress and anxiety-dysphoria. Personality analysis further indicated heightened neuroticism, coupled with lower conscientiousness and diminished emotional stability, among the addicted group. These findings confirm that addictive smartphone use is strongly linked to both psychological distress and unfavourable personality characteristics. The study underscores the advantage of combining psychological assessment with machine learning to recognise vulnerable individuals at an early stage. Practical implications extend to mental health practitioners, educators, and policymakers, who may use these insights to design targeted strategies aimed at mitigating smartphone addiction and enhancing digital well-being among young adults.

Keywords: Addiction, Machine learning, Mental health, Personality traits, Smartphone