

Use of Affective Computing and Wearable Technologies for Mental Health Management of University Students: A Review

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Abstract

Mental health challenges among university students have become a significant concern, with academic workload, social isolation, and personal issues being major contributing factors to mental disorders. This review aims to analyze existing studies on wearable technologies and affective computing to detect mental disorders among university students and identify the primary factors contributing to these issues. The review explores concepts such as affective computing, a key area of Human-Computer Interaction (HCI), and the application of machine learning algorithms, including Support Vector Machines (SVM) and Deep Neural Networks, for effective data processing and feature extraction. Following the PRISMA 2020 guidelines for meta-analysis, the study includes research sourced from various academic databases. The findings indicate that academic workload is the most significant stressor for university students, particularly those living in boarding houses. Additionally, inadequate sleep exacerbates negative emotions, highlighting the importance of features such as sleep tracking and heart rate monitoring to track physiological signals. Behavioral patterns, such as reduced SMS usage among highly stressed individuals, were also identified as potential indicators of emotional well-being. By synthesizing diverse approaches to managing mental health, the study identifies gaps in current capabilities, such as the contextual challenges of distance learning, and limitations like the high power consumption of wearable devices. These insights are categorized under themes of affective computing and wearable technologies. The study emphasizes the critical role of wearable technologies and affective computing in accurately diagnosing and monitoring mental health. The implications provide strategic guidance for future research to develop optimal solutions for managing the mental health of university students.

Keywords: *Physiological factors, Machine learning, Mental health, Wearable devices, Affective computing.*