

Title: Sleep and At-Risk Health Behaviors among Adolescents

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Sleep deprivation has been reported to have detrimental consequences on health and is overall linked to poor human functioning. Based on the evidence of previous research, insufficient sleep is highly prevalent among adolescence. This data mining project aims to investigate sleep deprivation and its' linked to several aspects of health among a nationally representative high school student. Youth Risk Behavioral Surveillance (YRBS) datasets published in 2015, 2017, and 2019 were used to examine the relationship between sleep and health risk behaviors and conditions related to depression, being bullied, unhealthy dietary behavior, academic performance, and physical activity. Data mining techniques including logistic regression, decision tree, random forest, and ripper were utilized to predict sleep deprivation using Python, Weka, and MATLAB. Based on our results, roughly three out of four US high school students (%76) did not get sufficient night sleep and sleep- deprivation was associated with several health-risk behaviors and conditions. Moreover, given the findings of several machine learning algorithms, the performance of logistic regression was the best and it achieved 80% of predictive accuracy. Findings could offer implications for public health and policy as adequate sleep is a critical factor for promoting health and reducing dysfunctional behaviors among adolescents.

Keywords: sleep, adolescence, at-risk behaviors, data mining, YRBS