Self-induced Sleep Loss: A Novel Risk Factor for Nighttime Food Desire in Adolescents and the Association with Brain Dopamine Signaling and Obesity

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Obesity is emerging as the most significant health concern of the 21st century. Although the genetic factors and the popularity of energy-dense food cause the increased obesity rate, it also appears that several lifestyle factors may increase vulnerability to calorie-rich food. Studies find sleep as a significant determinant of body composition besides conventional factors. To date, metabolic processes in the body have been studied to associate sleep loss and obesity. However, a few have examined the behavioral mechanism by which sleep is associated with obesity. Therefore, this study investigated whether self-induced sleep deprivation affects nighttime food desire and poor food choice, dependent on the reward functions of brain, in adolescents. Adolescents (n=118) were divided in two groups: Normal Sleep (NS, N=51) and Sleep Deprived (SD, N=67) on the basis of Sleep Survey. The Screen Time Exposure (STE) questionnaire for screen time habit, the Pediatric Daytime Sleepiness Scale (PDSS) for assessing sleep related problems, Food Desire and Nighttime Snacking Scale (developed by the researcher) for food habit, and Physical Activity Scale for energy expenditure were used. Finally, Body Mass Index (height and weight) was measured using electronic scales. Two-way ANOVA, followed by t-test and with Bonferrroni corrections for multiple comparisons, was used to compare the two groups. Pearson correlation and Path Analysis were used to test the relations among the variables. A p-value <0.05 was considered statistically significant. The findings indicate that sleep deprivation significantly affects the body composition of adolescents due to their poor food choice and reasons for nighttime snacking leading to the risk of obesity supporting the stated hypotheses.