ABSTRACT

SLEEP, INTERNALIZING SYMPTOMS, EXECUTIVE FUNCTIONING, AND DIABETES OUTCOMES IN ADOLESCENTS WITH TYPE 1 DIABETES MELLITUS

Ashley C. Moss, M.S.

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Insufficient sleep is a nearly universal problem during adolescence and is likely associated with various biopsychosocial and contextual factors present with this developmental period. Youth with type 1 diabetes mellitus (T1DM) may experience greater sleep difficulties, poorer sleep quality, and greater daytime sleepiness/fatigue compared to healthy youth. Also, sleep difficulties are associated with poorer diabetes outcomes (e.g., treatment adherence). Understanding how sleep may impact illness management during adolescence is critical given increasing rates of non-adherence during this developmental period. Although research suggests poor sleep is associated with decreased neurocognitive functioning and increased internalizing behavior among healthy youth, limited research has examined these relationships in adolescents with T1DM. Further, adolescents with T1DM are at increased risk for difficulties with executive functioning and internalizing behaviors compared to healthy peers, and these difficulties have been implicated in T1DM-related outcomes. As such, the present study examined relationships among adolescent-reported sleep quality, quantity, and diabetes-related outcomes and the indirect effects of sleep quality on T1DM-related outcomes through internalizing symptoms and executive functioning.

Eighty-one adolescents diagnosed with T1DM (ages 12-17) and their caregivers completed the study. Caregivers and adolescents completed questionnaires assessing adolescents’ executive functioning and adherence to diabetes management tasks. Adolescents completed additional questionnaires assessing sleep quality, daytime sleepiness, and internalizing symptoms. Adolescents’ medical records were reviewed to collect most recent hemoglobin A1c (HbA1c) values, which represent metabolic control.

Results partially supported hypotheses in that poorer sleep quality, greater daytime sleepiness, and longer sleep duration on the weekend were associated with poorer treatment adherence, but not metabolic control. As predicted, sleep quality was associated with adherence through anxiety, depression, and executive functioning. Daytime sleepiness was associated with adherence through anxiety and had a direct effect on adherence independent of anxiety, depression, and executive functioning.

Overall, results underscore the importance of assessing sleep quality and quantity in adolescents’ with T1DM. Targeting sleep as a point of intervention may help to improve adherence behaviors through internalizing symptoms and executive functioning.