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### Consistency is Key for Activity: Sleep Duration Regularity is Associated with Increased Activity in Children

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Children are recommended 9-11 hours of sleep per night and at least 60 minutes of moderate-vigorous physical activity (MVPA) per day, which are known to prevent childhood obesity and other poor cardiometabolic outcomes. Short sleep duration has been associated with lower MVPA and higher sedentary behavior in children, indicating that these behaviors may simultaneously contribute to poor cardiometabolic health in this life stage. However, previous studies tend to rely on subjective estimates of sleep duration, or fail to consider other metrics of sleep health, like sleep regularity. Thus, the extent to which sleep regularity relates to activity and sedentary time in children is unclear. **PURPOSE:** To evaluate associations between objectively estimated sleep and activity metrics in typically developing 7-12-year-old children. We hypothesized that shorter and less regular sleep duration would be associated with less MVPA, less steps/day, and more sedentary time/day. **METHODS:** 28 children ( $10 \pm 2$  years; 13 M/15 F) completed 7 consecutive days of 24/7 wrist accelerometry. Sleep metrics included average sleep duration (total time asleep) and sleep duration standard deviation (SDSD), a measure of sleep regularity (calculated as the standard deviation of nightly sleep durations). Physical activity metrics included average MVPA (min/day) and step count (steps/day), as well as sedentary time (min/day). Pearson's  $r$  correlations were used to evaluate associations between sleep and our metrics of interest. **RESULTS:** On average, sleep duration was  $7.63 \pm 0.67$  hrs/night, SDSD was  $0.83 \pm 0.58$  hrs, MVPA was  $6.88 \pm 1.80$  hrs/day, step count was  $11752 \pm 2910$  steps/day, and sedentary time was  $5.60 \pm 1.45$  hrs/day. Sleep duration was not associated with our metrics of interest ( $p > 0.25$  for all). However, SDSD was negatively associated with steps/day ( $r = -0.39$ ,  $p = 0.04$ ) and positively associated with sedentary time ( $r = 0.41$ ,  $p = 0.03$ ). Though not significant, the association between SDSD and MVPA ( $r = -0.33$ ,  $p = 0.09$ ) was in the hypothesized direction. **CONCLUSIONS:** Irregular sleep duration is associated with less physical activity and more sedentary time in children. These findings suggest the importance of promoting both regular sleep habits and physical activity in youth.

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