Poor sleep and neurocognitive function in early adolescence

Introduction: Evidence regarding associations between sleep duration and quality and neurocognitive function in adolescents remains scanty. We examined associations between sleep duration, efficiency, fragmentation and wake-after-sleep-onset (WASO) and intelligence, memory, and executive function, including attention, in early adolescence. We also examined if children belonging to groups with different sleep profiles differed from each other in neurocognitive function.

Methods: Participants included 354 girls and boys, mean age 12.3 years (SD=0.5) from a birth cohort born in 1998. Sleep was measured with accelerometers for 8 nights on average. Cognitive function was evaluated with subtests from the Wechsler Intelligence Scale for Children-III (WISC-III), Developmental Neuropsychological Assessment 2 (NEPSY-2), Wisconsin Card Sorting Task (WCST), Conners' Continuous Performance Task (CPT) and Trail Making Test (TMT).

Results: In girls, higher WASO and fragmentation index were associated with poorer executive functioning (higher number of perseverative errors in the WCST). Boys with shorter sleep duration, lower efficiency, higher WASO and fragmentation or who belonged to the cluster displaying these sleep characteristics scored higher on verbal intelligence (Similarities subtest of WISC-III) and/or lower on executive functioning tasks measuring attentiveness (more commission errors, shorter reaction times, and had lower D Prime scores in CPT).

Discussion: In adolescent girls, poorer sleep quality was only weakly associated with executive function, while in boys, poorer sleep quantity or quality was associated with higher verbal intelligence but also with an inattentive pattern of executive function.