

hours. The first timed race is scheduled to be done the first week in January.

Conclusion: This is the first research study to evaluate the effect of two important variables on sleep and performance in teenage swimmers.

Support: The authors report no financial support related to this study.

0992

PREVALENCE OF INSUFFICIENT SLEEP DURATION AND CONSEQUENCES ON DAYTIME SLEEPINESS, MOOD AND ACADEMIC PERFORMANCE IN THAI ADOLESCENTS

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Introduction: Insufficient sleep duration in adolescents is key public health concerns in many societies. This study aims to assess the prevalence of insufficient sleep duration and the association between short sleep with daytime sleepiness, depressive symptoms, and anxiety among Thai adolescents.

Methods: Thai adolescents aged 11 -18 years completed a self-administered questionnaire including Phramongkutklao Hospital Sleep disorders center Questionnaire, Pittsburg Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), The Children depression Inventory (CDI) scale and Child Anxiety Related Emotional Disorder (SCARED).

Results: 232 adolescents with the mean age of 14.58 (range 11-18) years participated in this survey. The average total sleep time was 7.44 hours. The overall prevalence of insufficient sleep duration (sleep duration <8 hours) was 37.5% and the small difference was found between males (42.0%) and females (32.7%). Compared with those who had a sleep length of 8 hours and more, insufficient sleep duration group exhibited higher in BMI and less in Grade Point Average (GPA). Subjective sleep insufficiency among Thai adolescent also had higher percentage of subjects with ESS ≥ 10 (43.2% vs 21.3%, $P < 0.001$), depressive symptoms (56.3% vs 39.3%, $P 0.012$) and anxiety (54.0% vs 38.6%, $P 0.022$) compare to those with adequate sleep duration.

Conclusion: High amount of Thai adolescents with poor sleep duration were observed in the study, consistency with prior surveys. Insufficiency sleep duration group had significantly increased daytime sleepiness, mood and anxiety problems among Thai adolescents. These findings emphasized the development of interventions to improve sleep duration in Thai adolescents and more sample size should be achieved in the future.

Support: None

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IMPACT OF CHANGING SCHOOL START TIMES ON PARENT SLEEP

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Introduction: No studies have previously considered how healthy school start times impact parents. Since parent and child sleep schedules, in particular wake time, are associated, we examined whether changing school start times would impact parent sleep

(elementary school [ES] 9:00am to 8:00am, middle school [MS] 8:00am to 8:50am, high school [HS] 7:10am to 8:20am).

Methods: Parents of students (grades K-12) completed online surveys pre-change, one-year, and two-years post-change (2017 $n=11,579$; 2018 $n=8,884$; 2019 $n=8,796$), reporting weekday bedtime and wake time (sleep duration calculated bedtime to wake time). Four PROMIS sleep questions asked about sleep “quality”, feeling “alert” upon waking, feeling “tired” during the day, and “daytime problems” because of sleep. Finally, parents were asked one-year post-change how happy they were about the new school start times.

Results: Parents with only ES students reported earlier bedtimes and wake times (10 and 13 minutes). Parents with ≥ 1 HS student woke later (HS only: 22 minutes; MS and HS: 25 minutes; ES and HS: 10 minutes; all 3 levels: 14 minutes) and slept longer (HS only: 19 minutes; MS and HS: 21 minutes; ES and HS: 12 minutes; all 3 levels: 18 minutes), with changes maintained two years. Similarly, parents of only ES students reported no change in sleep quality/impairment. Post-change, more parents with ≥ 1 MS or HS student reported good sleep quality (average increase=6.9%), feeling alert (average increase=5.8%), not feeling tired (average increase=5.0%), and having few daytime problems (average increase=4.2%), with benefits maintained two-years post-change. Across levels, parents who were “very happy” about start time changes slept longer than “very unhappy” parents (12-30 minutes); however, across levels, child sleep did not differ between happy and unhappy parents.

Conclusion: This is the first study to examine the impact of changing start times on parents of students in grades K-12. Study results show no significant impact on parents of elementary students. However, similar to students, parents of middle/high school students reported later wake times and increased sleep duration. Notably, parents’ happiness with start time changes was related to parent, but not student, sleep duration.

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ASSESSMENT OF SLEEP-WAKE AND CIRCADIAN RHYTHM DISRUPTION IN CHILDREN AND ADOLESCENTS DIAGNOSED WITH CRANIOPHARYNGIOMA

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Introduction: Patients with craniopharyngioma are at increased risk for hypersomnia/narcolepsy and circadian rhythm disruption, secondary to hypothalamic-pituitary involvement of the tumor. We assessed youth with craniopharyngioma to determine presence of the dim light melatonin onset (DLMO) and concurrent sleep disturbance.

Methods: Fifty-two patients (7-21 years; 51% female) enrolled on our institutional protocol for craniopharyngioma that included surgery, proton therapy, or both. In-home salivary melatonin was collected after surgery and hourly beginning 3 h before to 1 h after habitual bedtime to determine the DLMO, which was defined as the time that melatonin exceeded a 4 pg/mL threshold. Polysomnography and a next day multiple sleep latency test (MSLT) were also conducted.

Results: Hypersomnia/narcolepsy was indicated in 86% of patients. DLMO was detected in 29 (56%) patients and averaged 21:04 ($\pm 1:14$). All but 2 patients with a DLMO had a concurrent sleep diagnosis (18 hypersomnia, 8 narcolepsy, 1 insomnia). In those we could not compute a DLMO, melatonin was above the 4 pg/mL threshold in 19 (37%), suggesting that the DLMO was likely earlier than the sampling window. Two (4%) did not reach threshold, suggesting that the DLMO was later than the window. For patients in which DLMO was not computed, all but 4 had a concurrent sleep diagnosis (7 hypersomnia, 9 narcolepsy, 1 MSLT not completed). Three (6%) participants showed a pattern of melatonin decreasing before bedtime (2 hypersomnia, 1 narcolepsy). Sleep disorder diagnosis was not associated with whether a DLMO was detected or not.

Conclusion: DLMO did not occur within the sampling window in 44% of patients with the majority due to the DLMO likely occurring before sampling started. Simultaneous assessment of both sleep-wake disturbance and circadian phase could provide more informed sleep interventions for excessive sleepiness and circadian misalignment in this patient population.

Support: This study was supported by cancer center grant (CA21765) from the National Cancer Institute, and ALSAC.

0995

NIGHTCAP FOR SCHOOL-NIGHTS: ASSOCIATION BETWEEN MILK INTAKE AND SLEEP DURATION IN FIRST-GRADERS

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Introduction: Insufficient sleep has been identified as an obesity risk factor due to mechanistic pathways contributing to higher carbohydrate intake, including in children. Dietary intake of macronutrients, such as fats and protein found in milk, may serve as a modifiable risk factor for adequate sleep. We hypothesize that milk intake among a sample of urban first-graders may be associated with sleep duration.

Methods: Cross-sectional analysis of parent reports of an adapted version of the Child Sleep Health Questionnaire (CSHQ) and Block Dietary Data Systems Food Frequency Questionnaire (FFQ) were analyzed among a sample of 837 Black children in Brooklyn, New York. Summary scores were created for milk type. Milk intake was classified by fat content: whole milk and 2% categorized as high-fat, and 1% and skim as low-fat. Independent t-test, correlations and regression analysis to identify associations between parent reports of child's sleep duration and milk intake were conducted.

Results: On average, children were 7.3 ± 0.6 years old and 52% female. Nearly 57% of parents were immigrants. Children's mean BMI was 17.27, approximately at the 85th BMI percentile according to CDC index-for-age percentiles. On average, FFQ data reported children consumed high-fat milk 6 days a week. Linear variable regression analysis between high-fat milk intake and sufficient sleep were significant ($\beta = .0090$, $p < 0.05$). BMI was significantly associated with high-fat milk intake ($\beta = 0.17$, $p < 0.05$). However, high-fat milk intake was not significantly associated with (in)sufficient sleep, after controlling for BMI, sex and age. No difference was reported between immigrant parents and U.S. born parents.

Conclusion: Plausibly, high-fat milk is contributing to satiety and longer sleep duration. Future studies should include more

comprehensive measurement of milk consumption (i.e. time of day and volume) to consider possible effects on children's sleep. Actigraphy measures and sleep diaries should also be considered.

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0996

SCHOOL START TIMES ARE ASSOCIATED WITH YOUTH AND PARENT SLEEP DURATION.

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Introduction: Early school start times contribute to insufficient sleep in adolescents; however, we know little about the impact of school start times at a family level. Moreover, even among similar school start times, sleep opportunity varies depending on mode of transportation and travel time. Thus, the purpose of this study was to determine whether AM school departure time is associated with sleep duration in parents and young adolescents.

Methods: Parent-adolescent dyads ($n=31$) completed 10 days of actigraphy and sleep diaries. Adolescents were 10-14 year olds (58% male). Parents were predominately mothers (87%) and their mean age was 44 yrs ($SD = 5.9$). Dyads were 77% White, 11% Black, and 12% Biracial or Other. Youth leave for school time was assessed with the School Sleep Habits Survey. Actigraphy- and diary-assessed total sleep time (TST) was averaged across 10 days and on weekdays. Separate regressions models for parents and adolescents determined associations between school leave time (predictor) and two outcomes: 10-day TST and weekday TST.

Results: For adolescents, later leave for school time was associated with longer 10-day actigraphy-assessed TST ($\beta = .504$, $p = .012$) and diary-assessed TST ($\beta = .683$, $p < .001$). Later leave for school time was also associated with more weekday actigraphy and diary-assessed TST ($\beta = .661$ and $.426$, respectively, $p's < .05$). For parents, later leave for school time predicted more diary-assessed sleep across 10 days ($\beta = .481$, $p = .013$) and on weekdays, but this finding did not reach significance ($\beta = .373$, $p = .061$). Leave for school time was not associated with parents' actigraphy-assessed TST across the 10-day period or on weekdays ($p's > .10$).

Conclusion: The time that youth need to leave for school may more closely approximate sleep opportunity regardless of actual school start time. This is particularly relevant for urban and rural youth with long commutes. Findings add to the strong support that delayed school start times or flexible scheduling will benefit adolescent sleep and also suggest positive impacts at the family level.

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THE SLEEP DISTURBANCE SCALE FOR CHILDREN IN YOUTH WITH TOURETTE'S DISORDER

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Introduction: Sleep disturbance is common in youth with Persistent Tic Disorders (PTDs), including Tourette's Disorder. However, studies elucidating the nature of sleep problems in PTDs are limited. The present study examines the types of sleep disturbance present in youth with PTDs relative to healthy controls, and