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IMPACT OF SCHOOL START TIMES ON ADOLESCENTS

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Making teens wake for school before 7 a.m. — which is like adults waking at 4 a.m. every day — causes chronic sleep loss.

The American Academy of Pediatrics advises that middle and high schools begin *no earlier* than 8:30 a.m.



Tell our elected officials and school administrators to **#StartSchoolLater**. Support healthy school hours for all children.

startschoollater.net

OUTLINE

- Overview of healthy sleep in children
- Impact of insufficient sleep on children's learning and health
- Implications for school start time



CHILDREN'S SLEEP NEEDS

Age	Ideal Sleep Duration	Sleep Patterns
3-6 years	11-12 hours	Naps stop around 5 years of age
6-12 years	10 hours	Discrepancy between school and non-school nights
12 years+	9 hours	Later bedtimes

WHY DO CHILDREN AND ADOLESCENTS NEED SLEEP?

- Growth hormone is released during sleep
- Sleep consolidates learning and promotes cognitive development
- Elementary aged children with good sleep habits report increased satisfaction with school and better academic performance.
- For children to adequately grow and develop cognitively, we must promote healthy sleep habits from infancy through adolescence.



SECONDARY EFFECTS

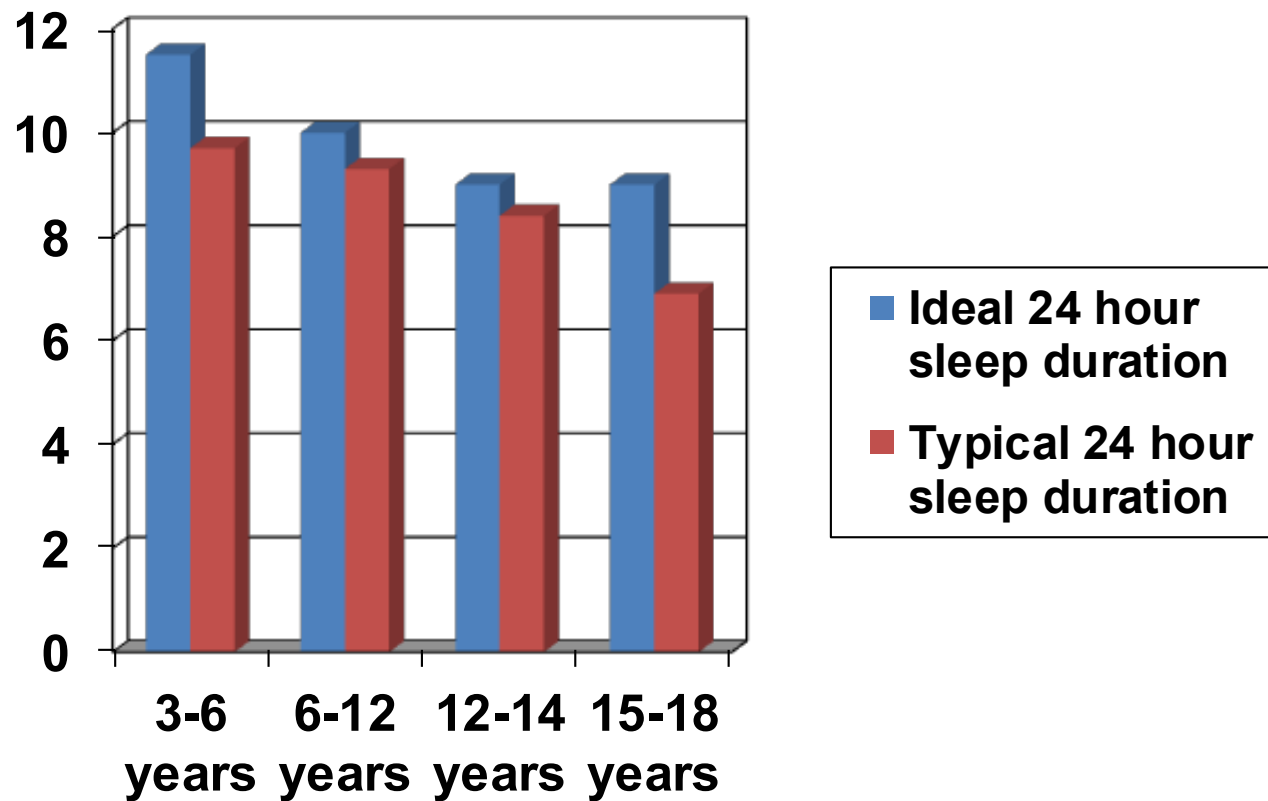
- Insufficient sleep in children may lead to problems with:
 - Cognitive development
 - Mood regulation
 - Attention
 - Behavior
 - Health
 - Quality of life
 - Family functioning



INSUFFICIENT SLEEP



INSUFFICIENT SLEEP



National Sleep Foundation 2004; 2006



IMPACTS OF SHORTER SLEEP DURATION

- Executive functioning
- Cognitive abilities
- Academic performance
- Memory
- Behavior problems
- Emotional problems
- **Greater impact on performance in girls**



SEVERE SLEEP RESTRICTION

- After one night of severe restriction, both children and adolescents have impairment in:
 - attention
 - verbal creativity
 - abstract thinking
 - concept formation
- Reflects poor executive functioning
- Individual susceptibility

Fallone et al., 2001; Randazzo et al., 1998



SLEEP LOSS IN ADOLESCENTS

- Middle and High School Students with lower grades (Mostly Cs, Ds, and Fs):
 - Obtain less sleep on school nights
 - Have later bedtimes on school nights
 - Sleep later on weekends
- 21% of poor sleepers had school failures and were behind in grade level by one or more years

Wolfson & Carskadon, 1998; Kahn et al., 1989



CIRCADIAN CHANGES IN ADOLESCENCE

- Biological changes occur with the onset of puberty
- Delayed sleep onset with delayed wake times
- Early school start times interfere with sleep duration

It's not just the iPads



IMPLICATIONS FOR SCHOOL START TIMES

- Delayed sleep onset coupled with early school start times are associated with:
 - excessive daytime sleepiness
 - falling asleep in class
 - inattention
 - decreased school performance
- Initial moves to early middle and high school start times related to bus cost savings
 - No science to support this
 - Resulted in negative impact to most vulnerable group



EXPERIENCES FROM DELAYED SCHOOL START TIMES

- 1997-1998 academic year, high school start times delayed in the Minneapolis and Edina Public Schools
- Moved from 7:15 am to 8:40 am.
- No later bedtimes than those with earlier school start times
- Later wake times
- Increased total sleep time of almost one hour per night
- Attendance rates and continuous enrollment improved
- Significantly fewer symptoms of depression
- Significantly less excessive daytime sleepiness
- Number of students participating in after-school activities did not change



MIDDLE SCHOOL STUDENTS ARE ALSO AFFECTED

- 8:37 am (L) vs. 7:15 am (E) start time
- School L students with average of 50 minutes more sleep per night

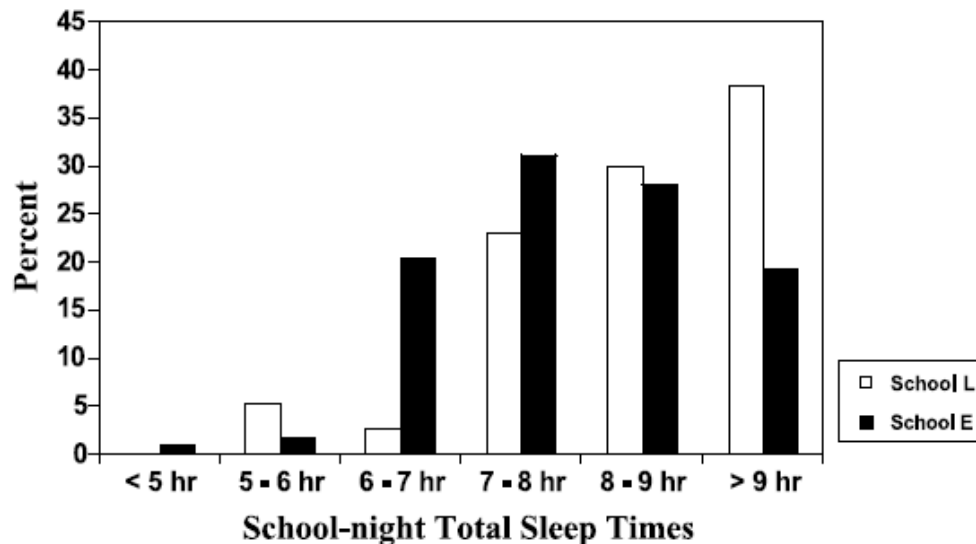


FIGURE 1 Distribution of school-night total sleep: Early- versus late-starting middle schools.

Wolfson et al., 2007



LATE VS. EARLY MIDDLE SCHOOL START TIME

TABLE 5
Means and Standard Deviations for Fall Academic Performance, Tardiness,
and Absenteeism Rates

Variable	School E				School L			
	7th		8th		7th		8th	
	M	SD	M	SD	M	SD	M	SD
Grade point average ^{*a}	83.16	7.16	76.85	9.45	80.46	10.11	83.79	8.80
Tardies ^{*b}	3.18	5.74	6.99	10.12	0.94	1.46	1.20	2.27
Absences	2.96	3.15	3.80	3.29	3.20	3.21	2.48	2.18

^aSchool × Grade Effect. ^bSchool effect.

* $p < .001$.

Wolfson et al., 2007



NEWER FINDINGS

- 9,000 high school students
- 8 high schools
- 5 districts
- 3 states
 - Colorado
 - Minnesota
 - Wyoming
- Ethnically and SES- diverse population



NEWER DELAYED SCHOOL START TIME FINDINGS

- High schoolers with school start times at 8:30 am or later have improvements in:
 - Sleep
 - Grades
 - Standardized test scores
 - Attendance
 - Graduation rates
- 60% obtain at least 8 hours of sleep on weeknights
 - Later the start time, the more students with > 8 hours of sleep



NEWER DELAYED SCHOOL START TIME FINDINGS

- High schoolers with a school start time of 8:30 am or later have less:
 - Tardies
 - Substance abuse
 - Caffeine use
 - Symptoms of depression
 - Motor vehicle accidents
 - Up to 70% fewer



RECOMMENDATIONS

- 2014 American Academy of Pediatrics Policy Statement
 - Early start times (before 8:30 am) are a “key modifiable contributor to insufficient sleep”
 - Urges middle and high schools to have start times that allow for sufficient sleep (8.5 to 9.5 hours per night)
- 2015 Centers for Disease Control
 - Urges school officials to:
 - Learn about research connecting sleep and school start times.
 - Good sleep hygiene + later school times improves health and academic achievement



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QUESTIONS?