



Teen Sleep Issues and School Start Times, Part I

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The research on the benefits of a healthy lifestyle and the consequences of an unhealthy one cannot be disputed. One of the main components of a healthy lifestyle is getting adequate sleep. Yet sleep is something frequently neglected in our society, especially among adolescents. Continually getting too little sleep can have serious consequences, including emotional,

behavioral, and performance problems. In addition, many mental disorders, such as depression, anxiety, mania, schizophrenia, post-traumatic stress disorder, and attention-deficit/hyperactivity disorder, can include sleep disturbance. This can complicate diagnosis and treatment with teens.

The National Sleep Foundation and many pediatric sleep specialists recommend the following sleep amounts relative to a child's age:

Age of Child in Years	Needed Hours of Sleep
1-3	12-14
3-6	10-13
6-11	9 ½ -12
11-18	9-9 ½

The four most common sleep disorders in children are (1) obstructive sleep apnea, (2) periodic limb movement disorder, (3) delayed sleep phase syndrome and circadian schedule disorders, and (4) narcolepsy. A more prevalent problem is not a sleep disorder, but a behavioral issue: poor sleep hygiene.

This article is not intended to discuss sleep disorders but to address the importance of sleep and the negative impact of sleep deprivation in youth. The Centers for Disease Control and Prevention reported that 25% of teens get no more than 6.5 hours of sleep nightly, far short of the 9-plus hours needed (Carpenter, 2013). Sleep deprivation is associated with information processing and memory deficits, increased irritability, anxiety, depression, decreased creativity, and decreased ability to handle complex tasks (CAREI, 2002).

The Center for Applied Research and Educational Improvement (CAREI) at the University of Minnesota reviewed research on teen sleep. They reported that risks with teenage sleep deprivation include mood and behavior problems, increased potential for alcohol and other drug use, and vulnerability for accidents. In addition, students who evidence a "sleep lag" tend to have poorer grades. Twenty percent of high school students fall asleep in school and 50% of teens report being most alert after 3:00 p.m. Forced awakening does not appear to reset the circadian rhythm, and the sleep lag is worse in schools with earlier starting times. Sleeping in on the weekends does not ameliorate these negative effects.

Circadian rhythm in teens

All living organisms appear to have rhythmic patterns at the cellular level known as circadian rhythms. The human body has an internal clock that is normally set by daytime sunlight and evening darkness. Teens experience delayed phase sleep problems where the natural circadian rhythms have an extended day and they are excessively sleepy in the mornings. That means, as all parents know, teenagers tend to stay up later and sleep in later. Adolescents report being unable to fall asleep in time to get the amount of rest needed given their wake-up schedule. Ironically in most school districts, high school has the earliest start time, which compounds the problem for teens who are struggling with circadian rhythm shifts and delayed sleepiness. There also is the effect of modern technology: the hypnotic and addictive use of electronic devices late into the night frequently delays the onset of sleep. Adolescent chronic sleep deprivation results in a form of perpetual pseudo-jet lag.

Physical consequences of sleep deprivation

There are a number of consequences associated with sleep deprivation. Chronically getting too little sleep disrupts many aspects of physical health, including hormone regulation, glucose metabolism, insulin resistance, inflammation processes, heightened pain perception, cancer, and reduced immune function. Although many early studies on sleep deprivation focused on total deprivation, more recent attention has addressed the more common problem of "partial sleep loss" or shortened sleep. This occurs when one cuts sleep short by an hour or two. Levels of leptin, a hormone that regulates hunger and appetite, drop during partial sleep deprivation. This can have effects on dietary choices, obesity, diabetes, high blood pressure, and cardiovascular disease, now referred to as *cardiometabolic disease*. Circadian and sleep disruptions also cause a metabolic slowdown that can be attributed to a weight gain of about 10 pounds per year. Children and teens showed stronger associations between shortened sleep and these disorders, suggesting greater vulnerability to sleep loss in youth.

Cognitive consequences of sleep deprivation

Wineberg (2012) reported that sleep plays an important role in learning and memory. Many studies demonstrate a relationship between sleep deprivation and compromised cognitive functioning: impaired performance and alertness, decreased time on-task and response shifts, memory loss, reduced information processing and reduced concentration (CAREI, 2002). One study conducted at Yeshiva University showed that children who have chronic sleep problems through age 5 are more likely to require special education by age 8 (Novotney, 2012). Another study, from Northwestern University, found high school seniors performed better in the afternoon than in the morning on tests of vigilance, symbol copying, visual search, and logical reasoning. Similarly, performance on tasks measuring executive function showed

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optimal performance for teens later in the day (Kirby, Maggi, & D'Anguilli, 2011).

Emotional and behavioral consequences of sleep deprivation

The emotional and behavioral consequences of sleep deprivation in adolescence are broad. Inadequate sleep is associated with increased risk of psychopathology and has a generally negative impact on school and learning. The Child Mind Institute (Miller, 2012) reported that children who got more sleep behaved significantly better in school on measures of emotional volatility, restlessness, and impulsivity, and even 27 more minutes of sleep reduced those behaviors. Conversely, cutting an hour of sleep had the opposite effect.

The National Highway Traffic Safety Administration reports driver fatigue results in 100,000 crashes annually, leading to 1,550 deaths and more than 70,000 injuries. This has frightening ramifications for teen drivers who tend to be sleep-deprived. In addition, sleep deprivation is associated with problems with moods and pain perception: it decreases optimism and sociability, and increases bodily discomfort and pain sensitivity (Carpenter, 2013).

Dahl and Lewin (2002) found that some teen substance abuse, which is used as a way of heightening arousal or decreasing anxiety and depression, can be attributed to the effects of sleep deprivation. They also documented an overlap between sleep regulation and behavioral/emotional problems in children and adolescents. Specifically, significant increases in depressed or anxious moods were found in teens reporting less than 6 hours of sleep per night. Seventy-five percent of students diagnosed with major depressive disorder report insomnia, and 25% report hypersomnia. Depressed and anxious adolescents frequently have difficulty falling asleep, are unable to get up or refuse to go to school, sleep in late in the day, complain of extreme daytime fatigue, irritability, and over time shift to increasingly more delayed sleep/wake schedules. The clinical

picture for anxiety disorders largely parallels that of depressive disorders with the added feature of increased fear and vigilance, which is antithetical to sleep states. Sleep deprivation may cause difficulties with self-regulation and control, attention, and impulsivity. These behaviors are also typically associated with ADD/ADHD, excessive aggression, and conduct disorders. It is not clear how sleep deficits influence these diagnoses.

Part II of this article will address positive sleep hygiene and report on several school districts that have addressed this widespread problem among teens. 

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Comparable advice for psychologists would include accepting the hurt the person expresses, helping the target to analyze the situation and to ascertain that the action is truly inappropriate, helping the client to recognize that s/he did not deserve the message or action, and providing the person with options about what to do next.

Cyberbullies may be people who have been bullied in the past. Bullies/victims (who both bully and are targets) in particular may need professional help and may benefit from efforts to increase self-esteem or social skills. Other

approaches to dealing with bullies and bullies who were victims include working on impulse control and appropriate emotional expression (Johnson, 2011). On the other hand, some literature suggests that bullies may have discovered an efficient way to gain status and power. They don't exactly have anger issues. They are working on "social climbing" (Willard, 2007). The psychologist would then need to concentrate efforts on explaining the seriousness of the consequences of cyberbullying and investigating other dynamics. In helping the target of bullying, clinicians may focus on developing "assertiveness skills, socialization skills, and improving self-concept" (Johnson, 2011, p. 6).

What Else?

This article did not discuss cyberbullying of adults, the fact that using labels may be problematic, and other important roles of psychologists. Besides dealing with targets or bullies, and developing good educational and preventive efforts, psychologists can bring knowledge of social contextual effects and personal beliefs on bullying tendencies. The websites listed below provide many helpful links to these issues. 

References

References are available on the PPA website, www.PaPsy.org, or from the author at cabral@maryu.marywood.edu.