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Sleep disorders symptoms in children, adolescents, and emerging adults: Reducing mortality and population health burden through improved identification, referral, and treatment

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Suicide is the second-leading cause of death in all age groups from ages 10–34.¹ Identifying risk factors for suicide in these age groups—especially those that may be amenable to intervention—may represent an opportunity to reduce the societal impact of suicides. Sleep disruption (variously defined, including just being awake at night²) has emerged as a key risk factor for suicide, associated with a 2- to 3-fold increase in risk.³ Clarifying this relationship and identifying potential points of intervention may serve to reduce this risk.

The study by Carbone and Casement⁴ presents compelling data that sleep disorders in children, adolescents, and young adults are associated with increased risk of suicidal ideation and attempts, based on data extracted from the Health Care Cost Utilization Project’s Nationwide Emergency Department Sample (N = 65,230,478). They found that youths with a sleep disorder were three times as likely to have an emergency department encounter related to suicide ideation. In addition, they found that when psychiatric disorders were comorbid with sleep disorders, the probability of suicide ideation was nearly 50% higher than those with the psychiatric condition alone.

These findings highlight the important role of sleep disorders in children, adolescents, and emerging adults. It is possible that addressing sleep disorders in this population could profoundly impact health and well-being. Regarding the work in the study by Carbone and Casement,⁴ addressing these conditions may represent an intervention opportunity for reductions in suicide risk. Despite the significant impact of sleep disorders in the Carbone and Casement study,⁴ less than 1% of youths admitted to emergency rooms had a history of a diagnosed sleep disorder. This is much lower than available population estimates.

Ohayon and Guilleminault reviewed epidemiological surveys of sleep disorders over a 20-year period and found there was not even one survey that had adolescent sleep problems as a focus.⁵ Despite consistent calls for additional epidemiological research to better understand

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the prevalence rate of sleep disorders in adolescents, there remains a relatively small body of literature. The American Academy of Pediatrics estimates that sleep problems affect 40% of adolescents.⁶ Overall, studies with adolescents report a high occurrence of irregular sleep-wake patterns, insomnia, sleepiness, and difficulty staying asleep.^{7,8} Recent research has highlighted that many adolescents do not have adequate total sleep time, and nearly one-fourth reports sleeping 6 hours or less per night.⁹ Further, there are disparities in sleep duration across grade levels, with high school seniors (12th graders) having the lowest proportion of adequate sleepers and freshman (9th graders) having the highest.¹⁰

Biological changes that occur in teens (endogenous circadian processes and sleep homeostatic factors), in tandem with social and environmental factors (eg, evening technology use, early school start times, sports/extracurricular activities, etc), drives later bedtimes and short sleep.¹¹ An ever-growing body of literature on insufficient sleep has shown it to adversely impact a myriad of key adolescent outcomes, including academic performance, school attendance, cognitive processing, sustained attention and alertness, learning, memory, risk-taking behavior, and mental/physical health.¹² In a study with almost 30,000 high school students, the authors found that for each hour of lost sleep, there was a 38% relative increase in feeling sad or hopeless, and a 58% increase in teen suicide attempts.¹³ School start times are a major limiting factor on wake times during the school week, and early school start time is recognized by the American Academy of Pediatrics as a modifiable factor that is a key contributor to adolescents' insufficient sleep and circadian sleep disruption.⁷ In a study of a representative sample of 46,537 high school students at 166 different high schools across the state of Colorado, the authors found that schools with late start times (> 8:30 AM) saw 32.2% of students sleeping 8 hours per night or more, relative to 23.2% in schools with very early start times (< 8:00 AM). It will be important for implementation science research to better define and communicate best time change management practices.¹⁴

Although community prevalence rates suggest that there is an epidemic of sleepy teens facing significant consequences for untreated sleep disorders, those numbers do not match the number of adolescents who are actively receiving treatment in clinical settings. Sleep problems (including those that do not rise to the level of a clinical disorder) have become ubiquitous and often do not come to the attention of healthcare providers. In a survey of approximately 150,000 children seen by primary care physicians, only 3.7% had a sleep disorder diagnosis compared with a much higher prevalence rate estimated in epidemiological studies.¹⁵ Additional research has shown that in many cases, parents do not raise concerns about sleep with their child's physician.¹⁶ In comparison to the spectrum of sleep care that is available for adults, nationwide there are few pediatric sleep clinics which furthers compounds the rates of identification and treatment of sleep disorders in adolescents.

The field of clinical sleep medicine has a responsibility to investigate the discrepancy between the prevalence rates of sleep disorders in adolescents and the rates of identification, referral, treatment, and adherence to treatment. It is critical to identify the barriers that impact the likelihood of referrals from primary care and other specialty medical disciplines, and the rate of referrals from schools and other settings that successfully result in the

adolescent presenting for care at a pediatric sleep clinic. It is also essential that the clinical sleep field begins to look toward other sources of referral. School administrators, teachers, and staff are very aware of the learning, behavior, and mental health problems of their students. Schools have potential to become a key place where most of this population has the best chance of being identified as having a potential sleep disorder. Perhaps improving awareness and education around sleep disorders in schools, leveraging school-based stakeholders (eg, teachers, counselors), and developing school-to-clinic referral pathways can begin to reduce the burden of sleep disorders on adolescents which Carbone and Casement⁴ show includes suicide—the second leading cause of death in this age group.

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