

Evidence for a School-Based Sleep Health Education Program?

Commentary on Kira et al. Sleep education improves the sleep duration of adolescents: a randomized controlled pilot study. *J Clin Sleep Med* 2014;10:787-792.

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Although individual differences exist in need and there is not a universal consensus on an optimal sleep duration, many studies support that most school-age youth (ages 10 and older) need at least 9 hours of sleep per night.¹ Data also support that over two-thirds of students do not achieve 9 hours,² and almost half of adolescents sleep 8 or less hours on school nights.³ During adolescence, shorter total sleep time (TST) is associated with higher levels of depressed mood, disruptive behaviors, lower grades, and more absences.^{1,2,4,5} Noteworthy chronobiological changes occur as youth become adolescents, with one of these shifts being a preference for later sleep onset and awakening times. This shift is partly due to physiology changes, but a significant portion is due to socially related delayed bedtime.¹ However, even with later bedtimes, early school start times preclude youth from sleeping longer.¹ Efforts that support youth in adopting healthy sleep habits, including extending sleep duration, have the potential to improve important school and health-related outcomes known to be associated with sleep insufficiency.

One key challenge to achieving sufficient sleep is lack of knowledge held by children and families about the importance of obtaining adequate sleep. Another critical element is the motivation to modify lifestyle factors such as sleep. That is, although knowledge is important, behavioral changes to increase sleep consistency and duration are equally critical. School-based sleep education programs are one way to universally reach the individuals for whom sleep insufficiency is a significant problem. A 2012 systematic review⁴ noted that there were only 8 studies and 4 pilot studies, which examined the efficacy of school-based sleep education programs. Since the review, some other school-based sleep education programs have emerged, but they are challenged by the same methodological concerns.⁶⁻⁸ Common ingredients in many of these programs include coverage of topics such as typical sleep patterns, information about the function of sleep, and sleep hygiene, but some of have also covered social and cognitive aspects of sleep-health behaviors as well as increasing motivation to change. Additionally, there is wide variability in delivery format, duration of program, and outcomes. Cassoff and colleagues concluded that newly developed programs should maintain a theoretical framework about health behavior change, involve caregivers, offer an online delivery format to reach more youth, and include motivational components and individualized information.¹

In this issue, Kira and colleagues³ utilized a randomized design to compare high school students who completed a four-session sleep health education lesson compared to those who completed their standard health curriculum. The intervention, referred to as the Australian Centre for Education in Sleep (ACES), was adapted to examine the efficacy among students in New Zealand. Interestingly, sleep knowledge did not change, but the authors found that intervention participants had a longer TST on weekend nights following the intervention compared to the controls. Such findings indicate that it may be possible to change habits without increasing content knowledge per se. One strength of the study was that it also included a follow-up period, and the effects of the main outcome (sleep duration on non-school nights) were sustained. In viewing the average bed and wake times, sleep timing and duration on weekends varied considerably within and between participants in both conditions at all data collection points. The authors acknowledge that the problem with increased TST on the weekend is that it may yield a wider discrepancy in average sleep duration between weeknight and weekend sleep. This shift may result in unintended consequences associated with inconsistent sleep habits. Indeed, data support that delayed bedtime on the weekends or a wider gap in sleep duration between school nights and non-school nights, is associated with risk taking behaviors,^{9,10} worse grades and test performance,^{5,10,11} and poorer social-emotional outcomes.^{2,11} Their remedy was for future intervention programs to target advancing bedtimes on school nights.

When considering potential interventions that are community-oriented, in this case in the schools, the authors reported potential administrative barriers to sustaining a school-based sleep health education program. Schools have competing demands with high stakes testing and accountability of student performance. Administrators may be inclined to endorse sleep education programs that show secondary gains, such as better attendance, teacher ratings of improved classroom behaviors, and stronger performance on standardized tests. Thus, future studies may benefit from collecting these data. Another approach to increase school personnel's acceptability of a school-based education program might be to infuse it with subject matters that are considered important (e.g., Math, Science, Language Arts). Likewise, the authors noted that some students viewed the ACES program as "boring." An example of sleep curricular materials that were aptly aligned to state

educational standards, promoted active learning, and were viewed as engaging by students, was *Sleep, Sleep Disorders, and Biological Rhythms*.¹² The materials, developed by the Biological Sciences Curriculum Study and part of the National Institutes of Health Curriculum Supplement Series, are available online including lessons and teacher guides.¹³ Similar integration of the ACES program with other core subjects and refinement using different modes of instruction could enhance the program that has already showed potential for sleep knowledge¹⁴ and/or behavior change in adolescents.³

Despite the aforementioned challenges, the authors have been successful in getting school districts in two countries to integrate the intervention into the respective health education programs. The current article is casted as a “pilot” study and lessons learned from this small RCT, together with the previous studies on ACES, prepare them for larger implementation. The research team acknowledged that potential ways to broaden their program impacts would be to incorporate caregivers or offer the program through the Internet. Subsequent well-controlled studies with substantive sample sizes documenting potential confounding variables will provide further evidence for this program. In addition to larger RCTs to provide experimental support for their sleep education program, strong program evaluation techniques may also be suitable for school-based educational programming for answering questions such as 1) Did the program work as intended?; 2) Was the program implemented as planned?; 3) Did the program have any unintended consequences; and 4) For whom does the intervention work and why?.

CITATION

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REFERENCES

1. Cassoff J, Knauper B, Michaelsen S, Gruber R. School-based sleep promotion programs: Effectiveness, feasibility and insights for future research. *Sleep Med Rev* 2012;17:207-14.

2. Perfect MM, Levine-Donnerstein D, Archbold K, Goodwin J, Quan SF. The contribution of multiple sleep problems to psychosocial and school functioning. *Psychol Sch* 2014;51:273-95.
3. Kira G, Maddison R, Hull M, Blunden S, Olds T. Sleep education improves adolescent sleep: a randomized controlled pilot study. *J Clin Sleep Med* 2014;10:787-92.
4. Blunden SL, Chapman J, Rigney GA. Are sleep education programs successful? The care for improved and consistent research efforts. *Sleep Med Rev* 2012;16:355-70.
5. Perfect MM. The relations of sleep and glucose to school performance in youth with type I diabetes. *J Appl School Psychol* 2013;30:7-28.
6. Diaz-Morales JF, Prieto PD, Barreno CE, Mateo JC, Randler C. Sleep beliefs and chronotype among adolescents: the effect of a sleep education program. *Biol Rhythm Res* 2011;43:397-412.
7. Souza IC, Souza JC, Louzada FM, Azvedo VM. Changes in sleep habits and knowledge after an educational sleep program in 12th grade students. *Sleep Biol Rhythms* 2011;11:144-53.
8. Vollmer C, Hammer J, Keller C, Maxand AK, Diaz-Morales JZ, Randler M. Development and evaluation of a sleep education program in middle school pupils based on self-determination theory. *Int J Biol Educ* 2014;3:12-23.
9. Pasch KE, Nelson MC, Lytle LA, Moe SG. Adolescent sleep, risk behaviors, and depressive symptoms: Are they linked? *Am J Health Behav* 2010;34:237-48.
10. O'Brien EM, Mindell JA. Sleep and risk-taking behavior in adolescents. *Behav Sleep Med* 2005;3:113-33.
11. Wolfson AR, Carskadon MA. Sleep schedules and daytime functioning in adolescents. *Child Dev* 1998;69:875-87.
12. Wilson CD, Taylor JA, Kowalski SM, Carlson J. The relative effects and equity of inquiry-based and commonplace science teaching on students' knowledge. *J Res Sci Teaching* 2010;47:276-301.
13. Biological Sciences Curriculum Study (2003). *Sleep, sleep disorders, and biological rhythms*. Bethesda, MD: National Institutes of Health.
14. Blunden S. The implementation of a sleep education program in adolescents. *Sleep Biol Rhythms* 2007;5(Suppl 1):A31.

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