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So Much to Do Before I Sleep: Investigating Adolescent-Perceived Barriers and Facilitators to Sleep

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Abstract

Adolescent sleep deprivation is a pressing public health issue in the United States as well as other countries. The contexts of adolescents' lives are changing rapidly, but little is known about the factors that adolescents themselves believe affect their sleep. This study uses a social-ecological framework to investigate multiple levels of perceived influence on sleep patterns of urban adolescents. Data were drawn from interviews and surveys conducted in three California public high schools. Most participants identified homework as their primary barrier to sleep, particularly those engaged in procrastinating, multitasking, or those with extracurricular demands. Results indicate that the home context has important implications for adolescent sleep, including noise, household rules, and perceived parent values. These findings identify important areas for future research and intervention, particularly regarding the roles of parents.

Keywords

health; parenting; qualitative methods; urban context; adolescent sleep

Adolescent sleep deprivation is a pressing developmental and public health issue. Although research suggests that adolescents need 8 to 10 hours of sleep each night (Hirshkowitz et al., 2015), nearly 73% of U.S. teenagers get less than 8 hours of sleep per night (Centers for Disease Control and Prevention, 2015). Chronic sleep deprivation leads to increased risk for physical and mental health problems, including obesity (Nishiura, Noguchi, & Hashimoto, 2010), anxiety and depression (Smaldone, Honig, & Byrne, 2007), drug and alcohol use (Carskadon, 1990; Dahl & Lewin, 2002), and injuries from automobile accidents (Martiniuk et al., 2013). Furthermore, there is evidence for a bidirectional relationship between sleep habits and cognitive, social, and emotional well-being during adolescence (Baglioni, Spiegelhalter, Lombardo, & Riemann, 2010; Gruber, 2013; Kahn, Sheppes, & Sadeh, 2013). Little is known, however, about the factors that adolescents themselves

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identify as restricting and promoting their sleep. The present study investigates these adolescent-perceived influences on sleep in a diverse sample of urban youth.

Multiple Influences on Sleep in Adolescence

Adolescent development is a function of biological processes, psychological experiences, and social contexts in which the young person lives and develops (Halfon & Hochstein, 2002). A social-ecological framing (Bronfenbrenner, 1979) helps conceptualize how proximal (i.e., microsystem) and distal (i.e., exosystem and macrosystem) contextual factors interact with individual processes (e.g., biology, stress, behaviors) to influence sleep. In particular, biological changes in homeostatic pressure (i.e., the desire to sleep at later times) and the circadian rhythm (i.e., the internal clock), as well as psychological factors (e.g., stress), may conflict with ecological factors to influence adolescent sleep trajectories (Dahl & Lewin, 2002; Owens, 2014).

Contextual Influences on Sleep—The increased salience of peers during adolescence (Crone & Dahl, 2012; Sunstein, 2008) represents a key microsystem that may affect sleep in multiple ways. For instance, the increased freedom to socialize with peers into the evening and nighttime hours (including virtually) can exacerbate biological changes associated with delayed bedtime (Carskadon, 2002). Early-stage romance can also result in adolescents reporting that they need less sleep (Brand, Luethi, von Planta, Hatzinger, & Holsboer-Trachsler, 2007). The family setting—and parents or other adults in the home—represent another microsystem that can play an influential role in adolescent sleep schedules. With increasing autonomy throughout adolescence, sleep monitoring may become difficult and fewer parents enforce set bedtimes (Buxton et al., 2015). Parents may also influence their child's sleep indirectly by setting rules regarding health behaviors such as caffeine consumption and electronic use, as found by a cross-sectional poll of U.S. families with a child aged 6 to 17 years (Buxton et al., 2015). Overall, however, the literature is limited with respect to the specific roles that parents play in supporting their adolescents' sleep and the extent to which parents' own values or attitudes about sleep may influence their adolescents' sleep patterns. Furthermore, few studies have looked at mesosystems—the interaction between different microsystems or settings (e.g., peers and parents, home, and school)—on adolescent sleep outcomes.

Although less studied, exosystems (e.g., characteristics of the neighborhood, parents' work conditions, transportation systems) have potential effects on sleep. Poor sleep quality has been associated with low neighborhood socioeconomic status (SES), such as living in disadvantaged census tracts (Brouillette, Horwood, Constantin, Brown, & Ross, 2011; Marco, Wolfson, Sparling, & Azuaje, 2012). Research using a within-person design found that children had later bedtimes on the nights following a violent crime in their neighborhood (Heissel, Sharkey, Torrats-Espinosa, Grant, & Adam, 2017).

Finally, macrosystems (i.e., overarching institutional or ideological patterns of society that affect human development) factors can influence sleep via local and national policies, cultural (or subcultural) values, and secular changes in communication and technology. For instance, school start times have received recent attention as a factor affecting adolescents'

sleep, with cross-sectional research using time-diary methods indicating that earlier school start times were associated with less sleep among teens aged 15 to 17 (Knutson & Lauderdale, 2009). Cultural values also influence sleep norms and attitudes, such as napping, bedtime habits, social and religious activity timing, and parental roles (Jenni & O'Connor, 2005; Tsai et al., 2016). An additional microsystem factor is the widespread availability of technology and social media, with concerns that youth prioritize social screen time over adequate sleep (Calamaro, Mason, & Ratcliffe, 2009; Hysing et al., 2015; Lemola, Perkinson-Gloor, Brand, Dewald-Kaufmann, & Grob, 2015; Li et al., 2007; Munezawa et al., 2011; Owens, 2014). The literature is inconsistent, however, regarding the direction of the relationship (Tavernier & Willoughby, 2014) and the degree to which stimulating technology affects sleep (Weaver, Gradisar, Dohnt, Lovato, & Douglas, 2010). Beyond the social distraction, physical exposure to the light emitted from electronic devices at night can result in suppressed melatonin production (Wood, Rea, Plitnick, & Figueiro, 2013), making it harder to fall asleep after youth put away their devices.

Self-Reported Barriers—Only two studies to our knowledge have assessed *adolescent self-reported* barriers to adequate sleep. A study of 384 U.S. high school students (primarily White) used a checklist to identify barriers that interfered with sleep, including too much homework, feeling stressed, watching television, and “hanging out with friends” (Noland, Price, Dake, & Telljohann, 2009, p. 228). A 2006 study that used semistructured interviews with 64 ethnically diverse U.S. middle school youth found that the main barriers to sleep were watching television, socializing with friends, being unable to fall asleep, and homework (Owens, Stahl, Patton, Reddy, & Crouch, 2006). More research is needed regarding sleep barriers, especially among ethnically diverse high school students, because the sociocontextual factors that impede sleep peak later in adolescence. Furthermore, social media and smartphone usage has increased significantly since these prior investigations, with adolescents and young adults spending more time on devices than any other age group (Pew Research Center, 2015).

Present Study

The goal of the present study was to provide a current and more contextualized understanding of adolescent sleep, investigating multiple levels of influence on the sleep patterns of urban adolescents. Our main research questions were as follows:

Research Question 1: What barriers to sleep do a diverse population of urban adolescents face across multiple socioecological levels?

Research Question 2: What roles does family play in adolescents' sleep patterns?

Research Question 3: What facilitators of healthier sleep patterns do a diverse population of urban adolescents experience across the multiple levels of the social-ecological system?

We note that little is known about the factors that support *positive* sleep habits in youth as the small existing literature focuses on barriers rather than investigating the conditions that enable “sleep health” (Buysse, 2014). Studying the factors that promote healthy sleep habits among adolescents is important to gain insights into the widespread phenomena of

adolescent sleep deprivation and guide interventions. Furthermore, there has been little research on parents' role in adolescent sleep; this study seeks to address this gap by exploring how parents influence their adolescents' sleep during this period of increasing autonomy.

Method

The data for this study were drawn from interviews and surveys conducted as part of a sleep intervention study in 2014–2015 in three California high schools. The intervention study design involved within-school randomization by class period in required health or career classes in three diverse, urban high schools. The curriculum, which was initially piloted and informed by adolescents from participating high schools, incorporated information on sleep science, activities to address unhelpful beliefs about sleep, strategies to improve sleep, and youth-developed goal setting.

Participants

Participants included ninth- to 12th-grade students between the ages 14 and 19 years ($M = 15.6$ years, $SD = 1.33$ years) who provided active assent and parent/guardian consent. The present study included qualitative data from consented students ($n = 142$) who were in attendance the day the research team conducted interviews midintervention (Fall 2014; described below) and quantitative data from those who participated in the 6-month follow-up survey in Spring 2015. Seventy-nine percent of participants who completed interviews also provided follow-up survey data; the remaining were lost to follow-up.

High schools were selected to maximize participant diversity in race/ethnicity, SES, and neighborhood disadvantage in this California city. We refer to these schools as (a) "Magnet," a large "academic magnet" school that requires high academic achievement in middle school for admission; (b) "Comprehensive," a mid- to large-sized school with middle-range academic performance index ranking; and (c) "Community," a relatively small school with a lower academic performance index ranking of three schools. All schools in the sample had a large proportion of adolescents eligible for free/reduced-cost lunch. Detailed information about participants and schools is provided in Table 1.

Procedures

Semistructured interviews.—Participants engaged in brief, 5- to 10-minute ($M = 7.03$ minutes, $SD = 3.15$ minutes) one-on-one interviews with members of the university research team, which were conducted in a manner consistent with motivational interviewing procedures (Hettema, Steele, & Miller, 2005; Rollnick & Miller, 1995). Because the interview data were collected during the intervention (Fall 2014), sleep barriers were reported in the context of adolescents actively considering or attempting to make changes to their sleep. Motivational interviewing style is affirming and accepting, reinforces motivational language, and seeks to identify the client's current stage of change (Rollnick & Miller, 1995). The interviewers used an open-ended format in which they asked participants whether they had identified any personal sleep goals or not, whether they had tried any sleep strategies, and whether there were any challenges that were getting in the way of meeting

their sleep goals. Example interview questions include the following: “What was your sleep goal? What is your current sleep schedule? What does your schedule look like once you get out of school in the afternoon?” Interview questions were open-ended; therefore, the barriers and facilitators reported were raised by the adolescents themselves rather than endorsed following a specific probe by the interviewer.

All interviews with participants were summarized with detailed notes, consistent with established qualitative research approaches (Wengraf, 2001). Interviewers used a template for note taking during the interview, and each interviewer was asked to review and add additional detail to his or her notes immediately after the classroom session. Interviews at two of the three school sites were also audio recorded (the Community School’s interviews were not audio recorded due to a scheduling delay in Institutional Review Board approval for audio recording, but analyzed from the detailed interview notes described above). Audio recordings were transcribed, and the transcriptions, together with the interviewer notes, were coded for emerging themes of strategies, personal schedules and environments, progress made on goals, and other indicators to indicate barriers that youth face in their own sleep habits.

Surveys.—Based on the interviews described above, a postintervention survey was designed to further investigate the complex contextual barriers to and facilitators of sleep (Table 2). The investigators and project staff developed the survey tool to (a) probe themes that emerged during the qualitative interviews and (b) investigate gaps in the literature on sleep barriers and facilitators, particularly the role of parents in adolescent sleep. Therefore, one section of the survey included quantitative assessments of individual-level and microsystem sleep barriers based on the preliminary data from the interviews, such as “eating dinner late,” “too much homework,” or “extracurricular activities” (0 = *never* to 4 = *almost always*). The survey also explored exosystem-level barriers to falling asleep, such as “my neighborhood is too noisy” (0 = *never* to 3 = *often*). In another section, participants completed a series of macrosystem-level questions reporting to what degree they agreed with statements regarding sleep values or perceived worth of sleep and statements regarding parent-set rules and practices around sleep, such as “My parent(s)/guardian(s) think that it is very important for me to get enough sleep” (0 = *don’t agree*, 1 = *somewhat agree*, 2 = *agree*) (see Table 3). Finally, participants responded to three open-ended survey questions about what (if anything) parents do that helps the participant get good sleep, what parents do that may get in the way of the participants’ sleep, and if applicable, why participants think their parents do not set a bedtime for them.

Data analysis.—We employed methods consistent with well-established qualitative data analysis approaches, utilizing a multistage analytic process (Miles & Huberman, 1994). Two members of the research team reviewed all the interview transcripts and summary notes to identify major themes related to adolescent-perceived barriers to sleep. We then identified and outlined an initial set of descriptive codes (key codes and subcodes) for these emerging barriers, organized by level of influence in the social-ecological model (Bronfenbrenner, 1979). These codes were verified through independent initial coding of a random sample of the interviews by two research team members, and then applied using a

codebook. An example of frequently applied codes from the codebook is included in Table 4, which includes “schoolwork,” “extracurricular activities,” “entertainment distractions,” “general time management,” and “socializing distractions.” Additional codes applied that are not listed in Table 4 include “not a priority,” “social activities,” “owl-like tendencies,” “college applications,” “stress/anxiety,” “family responsibilities,” “neighborhood noise,” “household noise,” “school start times,” and “lack of personal space.” Qualitative analyses were conducted in Dedoose software (Dedoose Version 5.2.1, 2015). Two trained research assistants (one BA-level and one master’s-level student) coded the interviews to ensure consistent coding applications (Cohen’s $\kappa = .73$). Any discrepancies in coding were resolved by discussion between the two coders. Coders were blind to participant demographics. Descriptive analyses (frequencies and means) were calculated on the quantitative survey data using SPSS 22.0 (IBM Corp, 2013). Participants with missing survey data ($n = 41$) were removed from the quantitative analysis.

Results

Adolescents reported an average weekday total sleep time of 7 hours 19 minutes at the time of the survey. Our qualitative analysis suggested multiple factors that contribute to the decline in adolescent sleep seen across the teen-age years, including individual-level behaviors and factors related to home and school. The key barriers that emerged in the interviews are described below, along with representative interview excerpts. The survey responses, also included below and in Table 3, largely mirrored the type and frequency of barriers that emerged in the interviews.

Individual-Level Influences on Sleep

Stress and anxiety played a role in some participants’ abilities to fall asleep. For many, stress was tied to specific responsibilities ($n = 4$, 2.8%): “I have trouble falling asleep just because I’m thinking of the things I have to do the next day, or ... everything I have to do in the next week” (female, 16, Magnet School). Others described planning or problem solving before bed as a sleep barrier ($n = 4$, 2.8%): “I think a lot when I try to fall asleep... . Mostly problems that are in my life, I kind of solve out. And that prevents me from sleeping” (male, 17, Magnet School).

Contextual Barriers to Sleep

The key contextual influences for youth in this sample spanned multiple levels of the ecological model: microsystem (i.e., school, peers and friend groups, extracurricular activities, home environment), exosystem (i.e., neighborhood environment, long commutes to school), and macrosystem (i.e., technology).

School.

The most commonly reported barriers to sleep in the interviews related to homework ($n = 67$, 47%). Homework-related barriers emerged in all three schools but were particularly emphasized at the Magnet School ($n = 50$, 35%), which has the reputation of being the most academically demanding school in the city, rather than Comprehensive ($n = 14$, 10%) or Community School ($n = 2$, 1.4%). Participants reported having too much homework, 67%

of students ($n = 95$) identified this as a barrier to their sleep at least “sometimes” on the survey, as well as starting their homework too late, 54% ($n = 77$) at least “sometimes.” For example, a 17-year-old female from the Magnet School described assignments with short turnaround times as particularly challenging for sleep: “Some days you get a little homework, and other days you get a lot... . Unfortunately, some days the assignments are due the day after they’re assigned.” Some participants started their homework too late due to full schedules of afterschool sports, extracurricular activities such as theater or clubs, or employment. More commonly, participants attributed delays in starting homework to poor time management or procrastination. Many spoke about procrastination as the reason for delaying their homework, as illustrated by this female 16-year-old from the Magnet School:

I’ve been trying to get to bed earlier ... I mostly procrastinate on my homework... .
I should probably start homework earlier but ... I never get around to doing that... .
I could theoretically go to bed earlier, but ... (loud sigh).

Peers/friendship group.

Socializing with peers as a sleep barrier was a major theme ($n = 27$, 19%). For example, a male 15-year-old participant from the Magnet School expressed that an area in which he could make changes to get more sleep was “... trying not to do so much stuff after school ... because sometimes I would hang out with my friends after school, I believe that’s what’s bothering me.” Others discussed how their sleep schedules were drastically different on the weekends: “Like let’s say like Friday or Saturday night, I’ll be out, hanging out” (male, 14, Comprehensive School). Fifty-three percent of students ($n = 75$) experienced “socializing” as a barrier to sleep at least “sometimes.”

Extracurricular activities.

Twenty-three percent of participants ($n = 33$) reported in interviews that in addition to homework and socializing, participating in extracurricular activities was a priority and regularly took up their time after school, with 44% ($n = 65$) confirming extracurricular activities as a barrier to sleep via survey data. Other participants discussed the combination of extracurricular responsibilities and homework resulting in sleep deprivation: “Like three or four days a week, I don’t get home until like 9, because I have to take tutoring classes and extracurriculars. So I don’t get to start my homework until really late” (female, 15, Magnet School).

Family influences.

Family members had both positive and negative impacts on their sleep. Family factors may be especially salient for low-income youth living in small apartments. For example, one respondent reported that her family watched TV in the room where she slept, as this was the only TV; it was a source of conflict that they watched TV when she needed to sleep. A 14-year-old female respondent from the Community School identified sleep problems due to sharing a room and a bed with a sibling, who snored and was a restless sleeper. Another participant lived with his uncle, aunt, cousin, and mother. He shared a room with his mother who sometimes watched television in the room. The light and noise from his family made it hard for him to get to sleep (male, 14, Community School). Other participants reported

similar themes about noise within close quarters, for example, “... my mom likes to watch late night soap operas so ... it’s pretty loud, so I can hear it” (male, 17, Magnet School). Another explained that what would help him fall asleep is “having my parents talk less in the night” (male, 14, Comprehensive School). In addition, survey results indicated students experienced family/household-related barriers to sleep, including eating dinner late ($n = 25$, 18%), family members staying up late ($n = 16$, 11%), household noise ($n = 18$, 13%), and household light ($n = 17$, 12%).

Of particular note, 35% ($n = 50$) of respondents reported going to bed *after* all adults in their household, with an additional 17% ($n = 24$) going to bed around the same time as the adults in their household, which limits how much adults can directly monitor whether and when adolescents are actually in bed trying to sleep.

In the survey data, respondents shared their perceptions of their parents’ values with respect to sleep. Responses suggested tensions between potentially conflicting values: Although 94% ($n = 134$) either “agreed” or “somewhat agreed” that their parents think that it is important for the respondent to get enough sleep, 47% ($n = 67$) of respondents also agreed or somewhat agreed that their parents do not care how much sleep they get as long as they get good grades. As one 18-year-old Magnet School male wrote in an open-ended survey response, “They like seeing me work hard all night on school work.” Another 15-year-old Magnet female participant shared a similar perspective: “They want me to get my [homework] done and as long as I keep grades up, sleep isn’t a big issue.” Participants also described other sleep-related beliefs that their parents held that were not supportive of healthy sleep habits. Several adolescents from the Comprehensive School expressed their parents’ apathy regarding sleep, for example, “My parents don’t really care about when or how I sleep” (female, 14) and “they don’t care or know how important sleep is” (male, 14). Comments from Community School participants alluded to the fact that parents have their own concerns and stressors that they are dealing with at night, explaining “They have other things to do” (male, 14) and “They’re always busy with work or taking care of siblings” (male, 14).

Neighborhood environment.

Four percent ($n = 6$) of participants expressed that neighborhood factors affected their sleep. A male 17-year-old participant from the Magnet School described the barriers to his sleep: “The loud noises. I live in a pretty noisy neighborhood so I hear the cars outside, the people talking.” Other participants ($n = 3$, 2%) shared that lengthy commutes to or from school interfered with their sleep schedules: “[My home is] all the way on the other side [of town]. So it takes me ... an hour to get here” (female, 17, Magnet School). One participant was temporarily living with extended family who lived far from her school so she had to get up early. Her family members brought their dog in the car, so she was unable to sleep on the long ride to school in the morning (female, 14, Community School). Another respondent discussed how her commute reduces her time set aside to do homework:

I would sleep at 11, which is an hour later than I planned on, but it’s ‘cause I take an hour and a half to get home on the bus so by the time I get home and eat dinner and take a shower, it’s kind of pretty late already. (Female, 17, Magnet School)

Technology.

Thirty-one percent of interviewees ($n = 44$) mentioned that watching television or online videos pushed their bedtimes later. For many adolescents, watching videos and engaging online occurred before or during homework, whereas others view it as relaxation or reward after completing homework or even after they have gotten into bed, for example, “So it’s a struggle. I stay up kind of late just like watching YouTube videos when I know I could go to sleep then, but I just want to watch more” (female, 17, Magnet School). “Binge-watching” was also reported by a substantial minority, for example, “... sometimes I watch a show that has many seasons and I just finish it all in one night” (female, 13, Comprehensive School).

Family-Related Facilitators of Sleep

In addition to adolescent-perceived barriers to sleep, the survey also explored facilitators of teen sleep. One action that adolescents identified as promoting healthy sleep patterns for them was parents’ enforcement of bedtimes, for example, “My parents set me a bedtime because they don’t want me staying up late on weekdays” (male, Community School, 15). Forty-nine percent of respondents ($n = 70$) endorsed that they “somewhat agreed” or “agreed” that their parents have a set bedtime for them on school nights. Participants indicated that they did not always *appreciate* the bedtime but they realized that it helped. This ambivalence was apparent in a comment from a 14-year-old male student from the Comprehensive School: “Sometimes my parents tell me, like, ‘Go to sleep early.’ ... I don’t actually listen to them, but sometimes I do.” Although parent-set bedtimes could support better sleep, our results suggest that high school students are negotiating more autonomy in various domains. In the open-ended survey responses, multiple adolescents reported that their parents trust them to set their bedtime, for example, “[my parents] trust that I’ll be responsible enough to know my limits and get enough sleep” (female, 14, Community School).

Multiple adolescents also reported that they get more sleep when their parents set a curfew for use of electronics, or take away their phones and other electronic devices, such as “no electronics after dinner” (male, 14, Community School). “If my mom see’s [sic] my phone on at night she’ll tell me to turn it off,” wrote a 14-year-old male from the Comprehensive School. More commonly, respondents described their parents’ strategy of charging electronic devices away from the teens at night: “They tell me to charge my phone outside my room like the kitchen” (female, 15, Comprehensive School).

Last, some adolescents reported that their parents prioritize sleep by setting an example (e.g., creating a quiet sleep environment) or communicating healthy sleep values or strategies. A 17-year-old male from the Magnet School wrote that his parents “encourage me to sleep earlier instead of doing homework.” “They tell me the effects of [not] having enough sleep and it worries me,” reported a 15-year-old male participant from the Comprehensive School. A 14-year-old female from the same school shared, “My parents sometimes give me a small lecture on the importance of sleep.”

Discussion

This study of adolescent-perceived influences on sleep highlights the complex demands and priorities that diverse, urban adolescents experience in their everyday lives that they report affect sleep patterns. The multimethod approach facilitated the in-depth examination of adolescents' perceptions of their family and home environments—and the resources and barriers for making change to their sleep.

Unpacking Social and Contextual Influences on Sleep

Consistent with prior research (Noland et al., 2009; Owens et al., 2006), we found that high school students experienced homework as a key barrier to sleep, particularly for those who engage in procrastinating, those multitasking of schoolwork and technology-related activities, or those with heavy afterschool extracurricular demands. Our study extends the literature in gaining further insight into the dynamics of the phenomenon among a diverse population. Although “overscheduled” affluent youth have been the focus of much media attention (Rosenfeld & Wise, 2000), we found that overcommitment was also present for many of the participants in our less affluent sample, who reported contending with long bus commutes, jobs, and family responsibilities as well as homework, sports, and extracurricular activities.

Our quantitative and qualitative results indicated that factors across social-ecological levels (Bronfenbrenner, 1979)—particularly the home context, family, and neighborhood—have important implications for adolescent sleep. Some reported that both household light and noise interfered with their sleep, with noise within the home experienced as equally or more disruptive than external neighborhood noise. School district data indicated that a substantial proportion of students at our participating schools were living in poverty; given the high cost of housing in this urban community, it is possible that noise within the home was exacerbated by tight space. Indeed, multiple respondents reported that sharing space for sleeping and TV watching affected their sleep. Some respondents also discussed how parents worked to create a quiet environment to help promote sleep; thus, increasing awareness of controlling the home conditions for sleep when possible is a potential point for intervention with families.

Our qualitative findings further highlighted the discrepancy in the concepts of “going to bed” versus “going to sleep.” Many teens, when probed about their bedtime habits, reported that they physically get into bed at their parents' request (and may even turn off the lights), but stay awake using their cell phones or other electronic devices. Reminiscent of children reading books under the covers with a flashlight in prior generations, the narratives of these 21st-century urban youth further highlight that late-night phone usage is a frequent and widespread barrier to sleep. As many of the study participants shared, having a parent-set electronic curfew is one area for intervening on technology use at night, which includes charging electronic devices in a different room or turning them off completely. Many youth, however, expressed deep psychological attachment to their phones; thus, further research is needed to understand how electronic curfews can promote positive sleep without causing undue strain and power struggles within parent–adolescent relationships.

Exploring the role of parental monitoring regarding sleep during this period of increasing adolescent autonomy was an important area of investigation. Due to the rapid social development that occurs during adolescence and the fact that many parents are asleep when their teens are still awake, encouraging high school-aged youth to set their own desired bedtimes to support healthier sleep habits may be an appropriate exercise of autonomy.

New Insights for Sleep Health Promotion

Our results help identify important areas for future research and intervention, particularly regarding the roles of parents. A novel line of inquiry in the present study was adolescents' report on their perception of their families' values regarding sleep. Although most participants reported that their parents think that it is important for them to get enough sleep, nearly half reported that their parents prioritize their getting good grades over sleep. We note that a large proportion of our urban public school sample were from low- to middle-income immigrant families, many with parents who had emigrated from China or Latin America and for whom educational advancement may be particularly salient. Although we could not directly investigate how immigration status, income, and cultural values related to family practices regarding the trade-offs of sleep versus educational goals here, this potentially rich area warrants future inquiry.

Our pattern of findings highlighting the competing demands for sleep suggest multiple possibilities to direct intervention efforts including individual time management skills, family norms about the accessibility, timing, and location of electronic devices in the home, and peer norms regarding social communication late into the evening. There is also a movement afoot in the United States for macro-level changes at the school or policy level, such as making high school start later in the morning (Au et al., 2014). Our findings also suggest the need to consider meaningful school-level changes in the patterns or coordination of homework and test assignments, as even those who were motivated to make improvements in their sleep habits anticipated needing to backslide during crunch times of concentrated assignments and exams.

A key contribution of this study is the investigation of adolescent-perceived facilitators of sleep and the role of parents' behaviors. From setting bedtimes and electronic curfews, to creating a quiet evening environment, participants reported multiple ways that parents helped promote their sleep. Thus, parental education is an area for future attention. Parent education should be undertaken with care, however, to help prevent unproductive power struggles over sleep between parents and adolescents or additional anxiety about not getting enough sleep. We suggest that resources for parents and adolescents about sleep should highlight its importance and promote youth-centered approaches, with adults as allies. Given developmentally appropriate increases in autonomy across adolescence, and our finding that these high school students go to sleep at the same time as or *after* parents, parents can support healthful patterns through modeling, scaffolding, and shared values that begin early in adolescence.

Strengths and Limitations

Strengths of this study include a diverse school-based sample of middle and lower income students, primarily ethnic minority and immigrant youth who have been understudied in the current literature on sleep in the United States, despite the fact that racial/ethnic minority youth are at higher risk for poor sleep (Adam, Snell, & Pendry, 2007; Maslowsky & Ozer, 2014), as well as our utilization of both interview and survey methods. Another strength was our recruitment of participants from required high school classes, minimizing selection factors within each school. Our multimethod design and sampling is intended to complement large-scale survey research by investigating the lived experiences of diverse youth from Asian American and Latino families from multiple schools. The extent to which patterns found here generalize to a broader population of urban youth is a topic for further research.

Several limitations of this study should be noted. First, because we conducted our research during class time, interviews were brief and could not fully explore all topics that emerged. Although we have detailed notes from all interviews, audio recordings were able to be conducted at only two of the sites. Second, we experienced some participant attrition between interviews and the survey (21%), a common challenge in school-based research. Third, we note that adolescent-perceived barriers may be influenced by participants' health and well-being, dimensions that were not assessed here. Fourth, future research would also benefit from connecting perceived barriers with objective assessments of sleep. Fifth, the cross-sectional nature of this analysis did not permit analysis of sleep barriers and facilitators over time; future research could explore changes in these factors throughout adolescence. Last, our data regarding parents are from the perspective of the adolescents; an interesting future direction would be to compare adolescent and parent reports of barriers and facilitators of sleep to examine their independent and interactive effects on sleep. Assessing parent sleep habits may provide additional insight into the complex ways in which adults may influence their children's sleep.

Although our study included three schools and adolescents from diverse ethnic groups, our sample was not intended to enable systematic quantitative testing of between-school or between ethnic group differences due to sample size limitations, and the fact that school, ethnic group membership, and grade level were not independent from one another. Exploring adolescent-perceived barriers by school context is an additional area for future research, as varying emphasis on academic performance or extracurricular involvement within the school environment may influence sleep patterns by school.

Overall, our research suggests that it is important to design flexible sleep interventions to respond to the diverse barriers, facilitators, and demands that adolescents face in their sleep health. Educators and researchers have an opportunity to include adolescents in the development of sleep interventions or youth-led research projects, enabling them to acknowledge the diversity of adolescents' lives, the contexts in which they live and go to school, and the wide range of barriers that high school adolescents experience.

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Table 1.School and Demographic Information for the Analytic Sample ($n = 142$).

	Magnet ($n = 70$)	Comprehensive ($n = 43$)	Community ($n = 29$)	Total ($n = 142$)
School information				
Student enrollment	2,700	1,950	950	
Percent qualified for free/reduced-cost lunch	44.60%	62.50%	75.30%	
2012–2013 academic performance index (range = 200–1,000)	956	772	640	
School start time	Mondays: 9:15 a.m. Tuesdays to Fridays: 7:35 a.m.	8:00 a.m.	8:10 a.m.	
Student information				
Gender				
Male	26	17	15	58
Female	43	26	14	83
Other	1	0	0	1
Major ethnicity				
Asian American	48	29	3	80
Latino	6	10	15	31
African American	0	0	1	1
White	9	1	6	16
Other	3	0	0	3
Multiethnicity	4	3	3	10
Age				
14	0	22	16	38
15	10	11	9	30
16	24	5	4	33
17	24	3	0	27
18	12	1	0	13
19	0	1	0	1
Grade				
Ninth	0	33	29	62
Tenth	23	1	0	24
Eleventh	25	8	0	33
Twelfth	21	1	0	22

Note. Student demographic information was collected at the time of the surveys (i.e., 6 months after the beginning of the larger, intervention study).

Table 2.

Six-Month Follow-Up Survey Tool. These questions ask about bedtime and waking routines in your family and how you and your parent(s) or guardians feel about sleep. Indicate how much you agree with the following statements by circling your answer choice:

	Don't agree	Somewhat agree	Agree	
1. My parent(s) have a set bedtime for me on school nights ("school nights" are when you have school the next day)	0	1	2	
2. My parent(s) have a set bedtime for me on weekends	0	1	2	
3. I usually go to sleep when I decide on school nights ("school nights" are when you have school the next day)	0	1	2	
4. I usually go to sleep when I decide on weekends	0	1	2	
5. My parent(s) wakes me up on school days	0	1	2	
6. My parent(s) wakes me up on weekends	0	1	2	
7. My parent(s) thinks that it is very important for me to get enough sleep	0	1	2	
8. I think that getting enough sleep is very important	0	1	2	
9. My parents don't care how much sleep I get as long as my grades are good	0	1	2	
10. My parent(s) and I have different opinions about what time I should go to bed on school nights	0	1	2	
11. I think sleep is less important than other things I want to do	0	1	2	
Which of the following best generally describes bedtime routines in your home?				
12. On school nights I go to bed:				
<input type="checkbox"/> before the adults in my family				
<input type="checkbox"/> at the same time as adults in my family				
<input type="checkbox"/> after all of the adults in my family				
<input type="checkbox"/> before some of the adults and after other adults in my family				
13. On weekend nights (Friday/Saturday) and during holidays/school breaks, I go to bed:				
<input type="checkbox"/> before the adults in my family				
<input type="checkbox"/> at the same time as adults in my family				
<input type="checkbox"/> after all of the adults in my family				
<input type="checkbox"/> before some of the adults and after other adults in my family				
On school nights: In general, how often do the following things happen around bedtime for you? Circle the answer choice that best describes you.				
	Never (1 -2 times per week)	Sometimes (2-3 times per week)	Often (4-5 times per week)	Almost always (6-7 times per week)
14. I have trouble getting to sleep because there is too much noise in my home	0	1	2	3
15. I have trouble getting to sleep because there is too much light	0	1	2	3
16. I have trouble getting to sleep because my neighborhood is too noisy	0	1	2	3

	Don't agree			Somewhat agree			Agree		
17.	0	1	2	2	3	4			
I go to bed late because I eat dinner late									
18.	0	1	2	2	3	4			
I go to bed late because I have too much homework									
19.	0	1	2	2	3	4			
I go to bed late because of other extracurricular activities (such as sports, clubs, jobs)									
20.	0	1	2	2	3	4			
I go to bed late because other people in my family stay up late									
21.	0	1	2	2	3	4			
I go to bed late because I am socializing with my friends online or on my phone									
22.	0	1	2	2	3	4			
I go to bed late because I start my homework later than I should									
23.	0	1	2	2	3	4			
I go to bed late because I get caught up in watching shows or videos online									
24.									
What, if anything, do your parents do that help you get to sleep? (Please leave it blank if your parents do not do anything to help you with your sleep.)									
25.									
Is there anything that your parents do to help you get to sleep that you feel is actually not helpful? (Please leave it blank if your parents do not do anything to help you with your sleep.)									
26.									
If your parents do not set a bedtime for you on school nights or help you get to sleep, why do you think this is? (Skip if your parents are usually involved in your bedtime.)									

Table 3. Descriptive Statistics From 6-Month Survey—Intervention Students Only ($n = 142$).

	Minimum	Maximum	<i>M (SD)</i>	% reporting at least “sometimes”
Barriers: I go to bed late because:				
^a I eat dinner late	0	4	0.63 (0.93)	18
I have too much homework	0	4	1.99 (1.2)	67
Extracurricular activities	0	4	1.28 (1.29)	44
People in my family stay up late	0	4	0.5 (0.8)	11
I am socializing with friends online or on my phone	0	4	1.69 (1.24)	53
I start my homework late	0	4	1.63 (1.18)	54
I get caught up watching shows or videos online	0	4	1.67 (1.27)	51
^b There is too much noise in home	0	3	0.55 (0.77)	13
There is too much light	0	3	0.43 (0.76)	12
My neighborhood is too noisy	0	3	0.30 (0.61)	6
% reporting at least somewhat agree				
Sleep values				
^c My parent(s)/guardian(s) think that it is very important for me to get enough sleep	0	2	1.62 (0.59)	94
I think that getting enough sleep is very important	0	2	1.66 (0.54)	96
My parent(s)/guardian(s) don't care how much sleep I get as long as my grades are good	0	2	0.62 (0.73)	47
Parent practices: My parent(s)/guardian(s):				
Have a set bedtime for me on school nights	0	2	0.58 (0.65)	49
Have a set bedtime for me on weekends	0	2	0.18 (0.45)	16
Wake me up on school days	0	2	0.92 (0.84)	61
Wake me up on weekends	0	2	0.36 (0.58)	32

^a0–4: never, sometimes, often, almost always.

^b0–3: never, sometimes, often.

^c0–2: don't agree, somewhat agree, agree.

Table 4.

Definitions and Examples of Most Frequently Applied Barrier Codes.

Code	Definition	Example	Interviews coded
Schoolwork	Participant reports homework, tests, studying, group projects being cause for not getting ideal sleep.	"I can't sleep earlier or else I won't have my homework done and I'll like, not do well on my tests because I don't know the content for understanding them."	67
Extracurricular activities	Participant reports that sports or other extracurricular activities affect evening schedule and ability to achieve ideal sleep.	"And I have Mock Trial, and I get home around 8. I have got college track, so I get home around 7:30 and I still haven't eaten dinner yet. And I have other program, which is a lot of stuff."	33
Entertainment distractions	General entertainment that poses a distraction/time management issue (i.e., participant watching TV, playing on phone or computer instead of doing homework or sleeping).	"The problem is not with my goal but it's with myself trying to get to my goal, because then when you're doing homework, I don't have like ADHD or something, but I feel like I get distracted a lot ... And then, um, sometimes my phone, and my computer ... even, a lot of students say that we need to use computers to work, and we do sometimes, but most of the times it's a distraction, because we have multiple tabs open."	31
General time management	Time management issues other than entertainment, including taking breaks, napping as a break, etc.	"I procrastinate a lot. So the first thing I do when I get home, I'll just eat and play games."	27
Socializing distractions	Socializing using social media, phone, texting as a distraction from doing homework or sleeping.	"Haha, yeah, like Facebook notifications going on, and then text messaging. Basically you are looking at every other thing than homework to do."	27

Note. ADHD = attention deficit hyperactivity disorder.