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"My stuffed animals help me": the importance, barriers, and strategies for adequate sleep behaviors of school-age children and parents

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ABSTRACT

Study objectives: To describe parents' and school-age children's sleep-related cognitions and behaviors.
Methods: Parents (n = 36) and school-age children (n = 40; 6-11 years old) from New Jersey, Florida, and West Virginia participated in focus groups lasting ~60 minutes for parents and ~30 minutes for children. Trained researchers led the focus groups designed using Social Cognitive Theory constructs. Standard content analysis procedures were used independently by 3 trained researchers to analyze focus group data.
Results: A consistent finding across focus groups was that a set bedtime was a typical behavior. Both parents and children recognized the importance of sleep for health and academic success. Technology was highlighted by both groups as a barrier to adequate sleep. The children discussed postbedtime activities of their parents as barriers to sleep. Physical activity along with several healthy sleep practices was identified as strategies to improve sleep. Parents and children stressed the role of parents in promoting healthy sleep behaviors and sleep-conducive environment. Participants did not mention some well-established links between sleep duration and health as well as sleep-promoting behaviors. Several unique factors, not yet reported in the literature, were discussed by the parents and children including the use of stuffed animals for comfort and disruptive behaviors of others in the household.
Conclusions: Many of the cognitions of parents and children coincide with evidence from scientific literature surrounding sleep and sleep hygiene but also demonstrated sleep hygiene knowledge gaps. Study findings can be applied to future sleep education materials targeting parents and school-age children.

Introduction

Sleep is paramount to the normal growth and development of children.[1,2] Obtaining adequate sleep not only confers physical and mental benefits but is absolutely essential to overall well-being.[3] However, attaining adequate sleep is a common household challenge for many parents and children. The National Sleep Foundation recommends that school-age children (6-13 years old) sleep 9 to 11 hours per night.[4] Yet, in the 2014 Sleep in America Poll, nearly one-third of children ages 6 to 11 years did not meet this recommendation and slept 8 hours or less nightly.[5]

Sleep duration affects many aspects of mental health in children, including motor learning skills,[6] working memory,[7] self-efficacy,[8] effortful control,[9,10] resilience,[11] affect,[12] and behavior.[12,13] In turn, academic performance and social interactions of children are affected by sleep duration.[9,14,15] Evidence indicates that adequate amounts of sleep are needed to promote emotional well-being and cognitive performance.[16]

It is widely known that sleep plays a large role in physiological function and health. Sleep deprivation studies reveal that inadequate sleep leads to impairment of immune function, glucose intolerance, and altered hormone levels.[3,17,18] Less than 9.25 hours of sleep per night was associated with increased cardiometabolic risk in children,[19] whereas 8 or less hours per night was an independent risk factor for hypertension in children.[20]

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It is well established that sleep duration and quality are associated with obesity. Numerous studies indicate that sleep duration is negatively associated with weight status at every stage of the life cycle.[21] Specifically, in children, short sleep duration (typically <10 hours per night) is associated with increased body mass index.[21–28] Shorter sleep duration in early childhood is associated with an increased likelihood of being overweight later in childhood[29] as well as later in adulthood.[30]

The struggle many families face in meeting sleep recommendations[5] indicates a need for the development of more effective education programs that enable families to improve their sleep behaviors. Social Cognitive Theory provides a valuable framework for educators to use to guide behavior change efforts in family-based interventions as it considers both individual and group level behavior change. For example, the construct of collective efficacy considers the level of confidence in a group's (ie, family) ability to change behavior.[31–33] Peer modeling is another construct of this theory that is particularly relevant in family-based interventions given that parent modeling of health behaviors influences children's behaviors.[31–33] Social Cognitive Theory is also well matched to the development of home-based health interventions because it is based on the concept of reciprocal determinism, which suggests that there is a bidirectional relationship between individuals and their environment (eg, individuals can change their home environment to facilitate healthy behavior changes).[31–33]

With the benefits and risks of sleep in mind, it is evident that establishing healthy sleep practices during childhood can set the foundation for lifelong healthy sleep habits. Currently, few studies have investigated parent's or children's cognitions (ie, beliefs, attitudes, etc) regarding the importance of, barriers to, and strategies for healthy sleep. The effectiveness of behavior change interventions can be enhanced by gaining an understanding of individual or group cognitions related to a particular behavior and how they verbally express this understanding, and then using these insights to inform the development of interventions.[31,32] Hence, this study aimed to examine these in parents and 6- to 11-year-old children with the goal of informing the development of sleep educational materials for these audiences.

Methods

The institutional review boards at the authors' universities approved this study's protocol. All participating parents gave informed consent for themselves and their children. Child participants also assented to participate verbally.

Sample

Parents of school-age children (6-11 years) who spoke English or Spanish and resided in New Jersey, Florida, or West Virginia, located in the United States, were recruited via printed or electronic announcements at community centers, houses of worship, schools, and worksites. Parents were invited to join a 60-minute group discussion focusing on small, simple changes they could make to help kids be healthier. Participating parents were compensated $25. School-age kids were recruited in a similar manner and received $15 for participating in a 30-minute discussion. Child participants were not necessarily offspring of participating parents.

Data collection methods

Parents answered a short questionnaire (eg, age, highest education level, number and ages of children) just before the focus group began. Children completed a similar questionnaire. The qualitative data collection method of focus groups were used in this study because they are a key method researchers use to explore and probe a target audience's cognitions (eg, feelings, perceptions, and opinions) about a behavior.[34] A semistructured focus group guide containing main questions and probes was developed and implemented according to standard guidelines.[35,36] Focus groups were conducted in a private, quiet area situated within a variety of locations including community centers, workplaces, schools, and day camps. Focus group questions were grounded in the Social Cognitive Theory[31–33] and aimed to elucidate attitudes toward adequate sleep, barriers to adequate sleep, and strategies for overcoming barriers to adequate sleep. This theory was used because it recognizes that health behaviors are explained by the dynamic interaction of behavior, personal cognitions, and socioenvironmental factors, all of which can be addressed in health promotion programs to elicit improved behaviors.[33] Parent focus groups were conducted in English and Spanish per parents' primary language. All children's focus groups were conducted in English because participants were fluent in English. Focus groups for younger children (ages 6-9 years) were held separately from those with older, more mature children (ages 9-11 years). Focus group sizes were intentionally kept small to allow for full participation by all parents and children.

All researchers involved in the focus group data collection and analysis completed formal training and practice sessions to ensure uniformity in data collection across groups. One researcher served as the focus group moderator. A second trained researcher wrote comprehensive notes detailing focus group discussions and transcribed the notes within 24 clock hours of completing the focus group and before being involved in a subsequent focus group. The focus group moderator then reviewed the notes for clarity, completeness, and accuracy within 36 clock hours of the interview. Spanish-language focus group notes were translated into English by the moderator conducting and note-taker recording notes of the focus group. Both the moderator and note-taker reviewed and discussed the notes to reach consensus on their contents. Subsequently, and within 60 clock hours of the focus group, an external reviewer reviewed the notes for clarity, identified any areas in the notes that were incomplete or unclear, and discussed these assessments with the moderator and note-taker, who made improvements in the notes until clarity and comprehensiveness were judged adequate and final. External reviewers were skilled focus group moderators of the research team who was not involved in collecting the focus group data under review.

Data analysis and reporting

The finalized notes from each focus group were subjected to standard content analysis procedures applied by 3 skilled researchers to detect themes in the focus group data.[37,38] Content analysis was used because it generates unbiased, systematic, and quantitative descriptions[38,39] that permit researchers to draw "replicable and valid inferences from the data to their context."[40(p21)] In brief, the content analysis procedures were for each researcher to independently review each thought unit (eg, phrase or sentence expressing a participant's sentiment) in the focus group data, and iteratively group and regroup thought units based on trends and similarity of meaning, ultimately resulting in thematic categories.[41,42] Researchers compared and discussed their content analysis results to reach unanimous agreement. The constant data comparison method was used synchronously with data collection to identify when data saturation (or information redundancy) occurred, which indicated that data collection should cease.[37,38,43]

Given that "qualitative presentation of results rests on verbal expressions,"[44] during content analysis, researchers also identified participant quotes to include as evidence supporting interpretation of the raw data.[42] An additional purpose of the quotes in this study

Table 1
Key sleep themes emerging from parent and child focus group data.

Parent themes	Child themes
Attitudes toward adequate sleep for children	**Attitudes toward adequate sleep for themselves**
• Adequate sleep is important children for these reasons	• Adequate sleep is important for these reasons
• School performance	• School performance
• Mood regulation	• Mood regulation
• Energy level	• Feeling energetic/not missing out on activities
• Health	**Beliefs about importance their parents place on sleep**
	• Adequate sleep is important to their parents because
	• Parents talk to them about sleep
	• Help kids grow
	• Prevent accidents
	• Do well at school
Barriers to adequate sleep for children	**Barriers to adequate sleep**
• Technology	• Technology
• Extracurricular activities	• Siblings
• Homework	• Parents' activities after child's bedtime
• Eating late	• Pets
• Being a "light sleeper"	• Bedtime routines
• Bedtime/sleeping anxiety	
• Seasonal variations	
• Age- and maturity-related transitions	
• School pressures	
• Parents' sleep habits	
Strategies for overcoming barriers to adequate sleep for children	**Strategies for overcoming barriers to adequate sleep**
• Bedtime schedule or routine	• Parent involvement
• Rewarding or punishing kids for getting to bed on time	• Sets limit technology
• Active play	• Sets/enforces bedtime
• Explaining importance of sleep to children	• Implements bedtime routines
• Monitoring children's activities after they are in bed	• Assuages children's bedtime fears
• Comfortable sleeping environment	• Helps children manage time during the day to allow for getting to bed on time
• Parent's understanding of value of sleep to children	• Explains importance of adequate sleep
	• Children's actions
	• Does not resist bedtime
	• Turns off technology
	• Plays actively during the day
	• Uses self-soothing strategies
	• Bedroom comfort and quiet
	• Remove sleeping distractions

was to gain a rich insight into how the target audience verbally expresses its thoughts related to sleep. By "hearing" the words of the target audience, health communicators are better prepared to tailor health communications on the target audience's own language usage. Tailored communications are more likely to be centrally processed cognitively by the target audience and have an increased likelihood of effecting change,[45] yet few health communication studies are able to be tailored to participant linguistic patterns because of the tendency of researchers to report quotes parsimoniously. The value of tailoring health communications coupled with this study's goal of applying the results to the development of more effective sleep education materials justifies the use of a quote replete reporting method.

Results

Thirty-seven parents (95% female) of school-age children (6-11 years) participated in 1 of 11 focus group discussions about sleep (group size averaged 3-4 participants, range of 2-6). Parents had between 1 and 6 children under 18 living in their homes (median = 2). Most parents (78%) had at least some college education. Two-thirds completed the focus groups in English, whereas 35% spoke Spanish. The number of focus group participants were fairly even across states (n = 14 FL, n = 11 NJ, n = 12 WV).

A total of 40 school-age children (38% female) participated in 1 of 14 focus group discussions about sleep (group size averaged 2-3 participants, range of 2-4). Median child age was 8 years (range 6-11 years), and children reported having between 0 and 3 younger siblings (median 1) and between 0 and 3 older siblings (median 1). Child focus group participants were fairly evenly distributed across data collection locations (n = 14 FL, n = 11 NJ, n = 15 WV).

Parent focus groups

Survey results indicated that most parents (94%) had a set bedtime for their school-age children. Having a set bedtime did not differ significantly by parents' primary language spoken, geographic location, or education level. There were no discernable differences between focus groups held with English- and Spanish-speaking parents.

Parents' attitudes toward adequate sleep

Overall, parents believed that adequate sleep was important for their children (Table 1). Some parents indicated that children "need sleep to do their best in school" and believed that "if [children] sleep less, they pay less attention in school." Mood regulation was another key motivator for parents to ensure their children got an adequate amount of sleep, as parents "don't want to have [their children] nagging or whining in the morning" as kids do when they do not get enough sleep. Energy and health were other benefits of sleep noted by parents, who felt that when children get adequate sleep, "they wake up healthier and stronger" and "they are less lazy and are more willing to do things."

Parents' perceived barriers to adequate sleep

Technology was the barrier to adequate sleep most frequently cited by parents (eg, "TV, video games, things like that, prevent [kids] from sleeping" because kids "want to stay up and watch it"). Technology appeared to be especially problematic when it was in

children's bedrooms. Parents said that, sometimes, when they check on their children after putting them to bed, "they are playing video games or watching TV when they should be sleeping." The second most commonly named barrier was extracurricular activities, such as "sports and practices and games that affect the routine" and delayed bedtime. Homework, eating late, and being a "light sleeper" also were identified as interfering with children's sleep schedules. A few parents also indicated that anxiety related to sleeping and bedtime was a barrier to adequate sleep, as some children are "very nervous about being upstairs [alone]" or are "light sleepers, so the slightest noise wakes [them] up."

Parents reported seasonal variations in the barriers they faced. Many reported that "during the school year, [their family is] pretty good about having a routine with sleeping," but "summertime interferes with the routine." During the summer months, children are "playing outside later" and "want to participate in special activities that may be later in the evening." "Longer daylight hours" also affect summer routines.

Generally, parents felt that ensuring their children were getting adequate sleep became more difficult as their children transitioned from preschool to elementary school. Parents reported that when children were younger, they went to sleep easier and "now they need a bedtime." Parents also reported that bedtime has become more challenging because elementary school children "have an opinion" and "as they get older, they start fighting with [parents to stay up later]." Parents noted that "there is more stress and pressure" to ensure kids have adequate sleep when they are in elementary school because children have to get up to go to school and cannot sleep in like they did as preschoolers. Getting-to-sleep problems increased because "they get more agitated at night" from the pressures of school. Parents noted that kids slept less as they got older, with some indicating that "on the weekends [kids] sleep about 30 to 45 minutes longer than during the week," which led them to believe that their children are not getting adequate sleep during the week.

Interestingly, many parents did not feel their own sleep habits affected their children. One commented, "They have no idea when I sleep; they're up in their rooms and I'm downstairs. It doesn't even occur to them that I might be watching TV after they go to bed, they think I just do chores after [they go to bed]." Another stated, "I don't think they know I have a bad bedtime routine." In contrast, a few recognized that "your child is like a sponge, they will do whatever they observe."

Parents' Strategies for Overcoming Barriers to Adequate Sleep

Most parents felt having a set schedule or routine helped to ensure their children got adequate sleep. For some families, that meant establishing a calming routine that included a bath, reading, soothing music, or spending some time cuddling. Parents had differing opinions about the role of technology at bedtime. Some parents chose to "turn everything off at bedtime" or have a "no electronics after a certain time" rule or did not have TV and other electronics in their children's bedrooms. On the other hand, some parents used technology as a part of children's bedtime routine by "playing a relaxing TV show" or having their children "go into their beds earlier to watch TV for 30 minutes" because it "seems to help them sleep better."

While most parents agreed that having a bedtime routine for children was important, not everyone agreed that having a set bedtime was helpful. Most parents felt that the consistency of a "regimented bed time and wake up time" was helpful and chose to establish a "strict bedtime" so that their children "become accustomed to the schedule." Although some other parents valued a routine, they were wary of "a strict time schedule, because it can be stressful if you are not on time." Other parents noted that bedtimes were not always realistic because of variations to the evening schedule that sometimes made a later bedtime necessary.

Other strategies that facilitated helping children get adequate sleep included rewarding kids and parents when children got to bed on time or punishing children "by moving bedtime up by 30 minutes the next day if they do not [get to bed on time the previous night]." Parents also suggested enrolling children in sports or encouraging active play because "tiring kids out makes them sleep easier." Parents also suggested talking to children so that they "know what is coming in their routine" because kids are more cooperative if they understand why it is important for them to do what the parent asks. For example, if children fuss about going to bed, parents can explain that the child "needs sleep for a big day tomorrow." Parents also reported that they check on their kids soon after putting them to bed "to make sure they weren't playing on their computer."

With regard to bedroom environment features that facilitate sleep, some indicated that they turned off lights (and, perhaps, turned on a night light). To promote better sleep, one parent purchased the child a new mattress, stating "I got him a new mattress, so that has helped him sleep longer. Yeah, I think the mattress definitely helps my child sleep more than he used to." While some parents indicated turning off electronics in the bedroom at bedtime no parents reported that their children's bedrooms were media free.

Focusing on the benefits to children of getting adequate sleep and understanding that "it is going to help their children in the long term" helped motivate parents. Parents also saw benefits for themselves because, if children get to bed on time, parents "have more time to talk or do things together." Overall parents understood that ensuring children get enough sleep is "beneficial for everyone in the family."

Children's Focus Groups

Children reported they had a set bedtime on an average of 5.70 ($SD \pm 1.94$) days per week. There were no differences in the number of nights children had a set bedtime by age or geographic location. Focus groups findings were similar for younger and older children.

Children's Sleep Attitudes and Behaviors

Almost all of the children felt it was important to get adequate sleep each night. Most of the kids cited school performance as the most important reason for getting enough sleep. The kids understood that sufficient sleep "helps [them] do well in school" and they noted that if they did not get enough sleep, they would feel "sleepy at school and might fall asleep." They reported that "if [kids] go to sleep at the right time, [they] will wake up and not be so tired for school." Mood regulation was another role of sleep identified by the kids. They reported that not getting enough sleep and feeling tired made them feel "on edge," "lousy and slouchy," "cranky," "annoyed," "lazy," "mad," and "very sad." One child stated that when he does not get enough sleep, he is "very rude and cranky and doesn't talk to people as much." Another indicated feeling "hangry" when sleep was inadequate.

On the other hand, children report feeling "fresh and awake, not really lazy" when they get adequate sleep. Getting enough sleep "makes [kids] want to play more and run more" because "sleep saves your energy for the next day." The kids felt that it is not as much fun playing with friends when they are tired, but when they get enough sleep, they "feel good" and "have energy to play with [their] friends." For one child, going to bed late and oversleeping meant "I miss my dad going to work."

Children thought that it was important to their parents that children get enough sleep because parents "talk to me about it" and "tell [their kids] to go to sleep all the time" and "have a set bedtime for [their kids]." Kids felt their parents placed importance on sleep because "sleep helps kids grow" and because "when [kids] wake up they

Table 2
Recommendations for interventions targeting improved sleep behaviors in families with school-age children

Social Cognitive Theory recommendations for future interventions promoting improved sleep behaviors	
Construct	Recommendation
Outcome expectations	Expand parent's knowledge of the negative effects of inadequate sleep on children to include impaired social interactions and relationship development.
Outcome expectations	Highlight the association between adequate sleep and healthy weight status.
Outcome expectations	Explain the link between inadequate sleep and increased hunger.
Outcome expectations	Broaden parent's understanding of the bidirectional relationship between sleep and physical activity.
Facilitation	Promote limiting technology use, particularly in close proximity to bedtime.
Facilitation	Provide parents with ideas for minimizing the effects of postbedtime activities of family members on child's sleep.
Facilitation	Share tips for overcoming barriers that result in delayed bedtime or disrupted bedtime preparation routines.
Facilitation/outcome expectations	Teach parents about the potential effects of consuming foods and beverages close to bedtime to help them establish rules about nighttime snacking.
Facilitation	Provide parents with strategies for setting and enforcing household rules that promote sleep.
Self-efficacy	Build parent self-efficacy for discussing the importance of sleep with children.
Facilitation/observational learning	Expand parents understanding of the impact of their personal sleep-related behaviors on their child's sleep behaviors and encourage positive parent modeling.
Outcome expectations/ facilitation	Promote the importance of adequate physical activity on sleep and suggest strategies for increasing child physical activity levels.
Facilitation	Encourage parents to create a bedroom environment that is conducive to sleep (eg, remove technology, keep room cool, dark and quiet)
Facilitation/observational learning	Provide parents with suggestions from other parents related to sleep.
Facilitation	Share tips for establishing a bedtime routine that promotes sleep.
Self-efficacy	Build child self-efficacy in engaging in healthy sleep habits independent of their parents' prompting.

have to go to school" and parents do not want their kids to be "to be too lazy to wake up and do things in the morning." Another reason sleep is important to parents is that you "might have an accident riding your bike to school if you're sleepy." The kids noted that parents are particularly adamant about kids getting enough sleep "when school starts" because kids "do good at school if [they] get enough sleep."

Children's perceived barriers to adequate sleep

Technology (eg, TVs, video games, cell phones, tablets) was the most common barrier to adequate sleep named by kids. They stated that they "want to play video games and not sleep" and "want to watch a TV show and it keeps [them] up." One child remarked, "I won't go to bed because I'm not tired enough, so I'll just play on my phone or my tablet." Technology use by others also can be a barrier to adequate sleep for children. Kids indicated that "siblings playing on phones and tablets" and parents' activities keep them awake ("Sometimes when I sleep, my mom and dad make popcorn and I smell it and I say, 'I need some of that.' Then, the TV shows are up loud and I can't sleep because I hear 'Game of Thrones' and 'The Walking Dead' [and it sounds scary]."). Other barriers to sleep included siblings and pets in the room making noise or moving around, "drinking or eating sugar before bed," "scary movies," "nightmares," and noises outside of the house. One child also noted that having "to do a lot of things right before bed, like take a bath, get clothes ready, brush teeth" delays bedtime and limits the amount of sleep children get at night.

Children's strategies for overcoming barriers to adequate sleep

Many of the strategies children suggested for overcoming barriers to adequate sleep involved their parents. For example, children suggested that parents could limit technology in kids' bedrooms by "taking away [a child's] phone." Children also thought parents could set and enforce a bedtime and could establish an "earlier bedtime if [the child] had a long day." Children also felt parents could be involved in their children's bedtime routine by "telling them a story, playing relaxing music, and laying down with them." Reassuring and comforting children before bed, particularly if kids had anxiety about the dark or being alone, were other advices given by children. One child noted, "If we are struggling to sleep, they [parents] help us—they come back and check on us. They will help with fears…do a lot to make sure we get enough sleep." The kids felt that parents could set children up for adequate sleep earlier in the day by "reminding [kids] to do [their] homework right when [they] get home" so that it does not run into bedtime and by "mak[ing] them "go outside [to play] so that they get tired." Kids also recommended that parents explain the importance of getting enough sleep ([You] are going to be cranky in the morning, so you better go to bed. Or, if you have a test in the morning, you may not do a good job.).

Kids also identified ways that they could ensure that they got adequate rest without relying on their parents. First, kids understood that listening to their parents and not arguing or resisting at bedtime would increase the amount of sleep they got each night. They also felt that they could hold themselves responsible for turning off technology before going to bed. Getting adequate exercise and burning off energy to make themselves tired were other responsibilities that the children felt they could take on themselves. Children also identified making themselves comfortable with blankets, pillows, and stuffed animals in bed at night; "getting rid of distractions"; "not sleeping in the same bed [with siblings] like I do…we punch each other and push each other off the bed"; and not having pets in the bedroom were ways they felt that they could promote adequate sleep. Some noted that it helps them fall asleep "when it's dark," "cold," and quiet and they hear white noise ("mom has this fan that makes noise that helps me sleep"). To stay asleep, children recommended that, before going to bed, have a snack, milk, and "make sure you go to the bathroom so you don't have to get up in the middle of the night." Finally, children found ways to soothe themselves. For example, one child stated, "When I am scared to go to sleep, I pretend my blanket is my shield and that means nothing can get through to me." Another noted, "my stuffed animals help me."

Discussion

The parents and children in this study agreed on many aspects of the importance of, barriers to, and strategies for healthy sleep. Both groups were aware of multiple sleep hygiene practices. Each group contributed unique information that will be helpful in the development of sleep education materials, summarized and organized by Social Cognitive Theory[33] constructs in Table 2.

Importance of sleep

Both the parents and children in the current study believe that sleep plays an important role in academic success. They independently stated that obtaining adequate amounts of sleep ensures that children feel alert and energetic enough to actively participate in academic activities. These cognitions coincide with scientific evidence. Cognitive outcomes such as mathematical problem-solving, language, and literacy skills, as well as approach to learning in children, were negatively influenced by reduced sleep duration.[13] Gruber et al observed higher grades in mathematics and English in 7- to 11-year-old children who improved their sleep hygiene after a sleep education program.[14] The relationship between sleep and academic success in children appears to be mediated by effortful control (a form of self-regulation in which children must use effort to control their own temperamental behavior).[9,10] Children with low effortful control and short sleep duration were unable to pay attention and regulate their own behavior in the classroom, and this was associated with low academic achievement.[9] Additionally, studies revealed that sleep improved working memory[7] and general self-efficacy scores[8] in children. Therefore, with adequate sleep, children may be more alert and cognitively prepared to learn.

Both children and parents in the current study agreed that sleep influences overall mood and associated behaviors. Evidence reveals that disrupted sleep and irregular bedtimes are associated with negative affect,[12] reduced resilience (ability to adapt to adversity),[11,46] and misbehavior in children.[11–13] Furthermore, reduced sleep duration and quality are associated with decreased social skill scores[13] and problems in peer relations.[15] However, neither the parents nor children in the current study indicated the importance of sleep in social interactions and relations. This factor may need to be emphasized in sleep education materials.

Although the parents and children both communicated the importance of sleep to health and growth, neither mentioned the specific link of sleep to body weight. Considerable evidence supports the inverse relationship between sleep duration and body weight status,[21] yet this information seems to not be widely known in the public. The children in this study did, however, refer to the negative effect of being "hangry" with reduced sleep. *Hangry* is a term used to describe irritability associated with feelings of hunger.[47] Research has revealed a link between reduced sleep and increased hunger and dietary intake.[21] Although research on hunger ratings in children with insufficient sleep is limited, cross-sectional studies revealed increased dietary fat and sugar intake in children with low sleep duration.[48–50] Sleep education materials targeting these groups should include information on the importance of sleep in promoting a healthy body weight.

Decreased physical activity is among many factors that contribute to poor sleep. Although parents and children in the current study cited physical activity as a strategy for promoting sleep, they did not link the importance of sleep to physical activity levels in children. Observational evidence has revealed that greater sleep duration is associated with increased physical activity levels and decreased sedentary time.[51,52] In one study, school-aged children who slept less than 9 hours per night spent more time in sedentary activity than those who slept more.[53] The bidirectional relationships between inadequate sleep and insufficient physical activity as well as their links to higher body weight warrant attention in sleep and weight-management interventions.

Barriers to sleep

Both parents and children discussed technology (ie, television and video games) as a barrier to getting adequate sleep. Media consumption and screen time have been widely reported to have an inverse relationship on duration of sleep. Media consumption during early childhood has been associated not only with decreased sleep duration[54] and sleep quality but also with increased bedtime resistance and sleep anxiety.[55,56] Additionally, Kim et al observed that spending 2 or more hours daily of leisure time using the Internet was linked with insufficient sleep duration (ie, 6 or fewer hours of sleep per night) in youth.[57] The parents in the current study indicated that having television in the children's rooms worsened the effect of technology on sleep. One observational study supports this notion by revealing a significant association between nightmares, sleep terrors, and sleep talking with the presence of television in the bedrooms of young children.[58] Beyond the stimulating content, nighttime exposure to the bright, blue light emitted from technological devices may reduce melatonin production and lead to poor sleep.[59] Studies have revealed that filtering the blue light helped improve sleep in young adults.[60,61] Exposure to bright daylight also may mitigate the effects of nighttime exposure to blue light.[62] The combination of light and stimulating content from media is a barrier that should be incorporated in future sleep education materials.

The children in the current study reported that the media activity of others in the household was a barrier to their own sleep. Perhaps, the noise and/or light of media devices used by the parents and siblings disturbed children as they were trying to fall or remain asleep. Beyond technology, other activities of the parents, including food preparation, were named as barriers to sleep by the children in the current study. Previous studies report that the behaviors of parents after their children's bedtimes are disruptive. For instance, one study reported a positive relationship between insomnia symptoms of parents and children's bedtime resistance, sleep duration, sleep anxiety, night waking episodes, and daytime sleepiness.[63] Future sleep education materials should highlight postbedtime activities of other household members as a potential obstacle to children's sleep.

Overscheduling was another barrier to sleep reported by the parents in the current study. Extracurricular activities, homework, dinner, bathing, and other afterschool activities can present the need to delay bedtime and/or reduce the duration of bedtime preparation. However, the children in the current study did not cite this as a barrier. The parents identified seasonal variation (ie, increased daylight in summer vs other seasons) and the transition from preschool to elementary school as additional barriers to sleep. Although the children did not refer to these barriers, they stated a lack of feeling tired and disruption from siblings and/or pets in their bedrooms as barriers to their own sleep. There is a paucity of research on these specific barriers; however, these factors should be considered when developing future sleep education materials.

One child noted that having sugar-sweetened foods or drinks before bed interfered with sleep, an observation supported by studies linking dietary sugar with short sleep length.[49] Interestingly, neither parents nor children identified caffeine as a barrier to sleep despite a wealth of scientific support.[64–66] Researchers continue to evaluate relationships between the dietary intake of specific foods and/or nutrients and quality of sleep.[67,68] Helping parents understand how dietary intake may help or hinder sleep is an important aspect to include in future sleep hygiene education programs.

Strategies for sleep

The parents and children in this study independently discussed sleep strategies that grouped into 3 genres: bedtime routine, physical activity, and bedroom environment. Both parents and children recognized that the parent's role in setting and enforcing a bedtime routine was essential to promoting healthy sleep. Evidence indicates that children are more likely to obtain adequate sleep if their parents practiced support behaviors.[69] This not only includes enforcing rules about the timing and components of the bedtime routine (e.g.

snacks, use of technology, pajamas, brushing teeth, bathroom use) but also explaining the importance of sleep on a regular basis. Both parents and children emphasized the large role that parents must play to encourage healthy sleep habits. Enforcing rules about bedtime as opposed to a specific bedtime was a positive predictor of children meeting sleep guidelines.[69] This coincides with the statements of some of the parents in the current study that a strict bedtime schedule is too stressful and should be avoided. Neither children nor parents suggested adjusting the bedtime earlier to ensure adequate sleep duration, although the children suggested moving other activities earlier to make room for the bedtime routine. The technique of bedtime fading was recently evaluated as an effective method of improving sleep onset latency, resistance to bedtime, and number of waking episodes after sleep in preschool-aged children.[70] Although this method has not been evaluated in school-aged children, it may be a useful option for children suffering from sleep onset latency issues. (Note: Bedtime fading, a counterintuitive technique, involves delaying the usual bedtime by 30 minutes. If the child falls asleep within 15 minutes of the delayed bedtime for 2 consecutive nights, bedtime is advanced 15 minutes. If the child does not fall asleep within 15 minutes, bedtime is delayed another 15 minutes. Bedtime is advanced in 15-minute increments until the usual bedtime is reinstated and the child falls asleep within 15 minutes.[70–72]).

The parents and children also agreed that enforcing rules about technology use (ie, time and place) would encourage healthy sleep. This included removing technology from the bedroom and limiting use prior to bedtime. The parents mentioned the use of punishments and rewards to encourage their children to follow bedtime rules, whereas the children mentioned the need to listen to their parents.

The children and parents agreed that it was crucial for parents to remind the children of the importance of sleep, which indicates that the parents need to be knowledgeable about the benefits of sleep. One study revealed that parents with increased knowledge of sleep benefits reported earlier bedtimes and more consistent sleep routines for their children compared with parents with less knowledge.[73] Parents should know and teach the importance of sleep to their children as well as enforce rules about bedtime routines.

Parents' own sleep habits have been shown to influence their child's sleep patterns, with children's sleep increasing an average of 0.09 hour per day for each additional hour of parent sleep.[74] However, parents in these focus group discussions did not feel that their sleep behaviors had an influence on their children. Future obesity prevention programs should emphasize the importance of parent role modeling of healthy sleep behaviors for their children.

The parents and children in this study both mentioned physical activity as a strategy for sleep. Moderate to vigorous physical activity during the day was associated with better sleep at night in school-aged children.[52,75] The Centers for Disease Control and Prevention recommend that elementary school students participate in at least 1 hour of physical activity daily[76] and obtain a minimum of 150 minutes of physical education per week.[77] Yet, just 15% of children meet the daily recommended physical activity levels,[76] and less than 5% of elementary schools are estimated to meet the physical education recommendations.[78–80] To increase moderate to vigorous physical activity, parents can encourage their children to engage in 8 or more hours of sports/exercise per week as well as active travel to school (ie, walking, biking, skating).[81]

Most of the other sleep strategies fall within the bedroom environment category. Besides removing technology from the bedroom, the children agreed that the room should be cold, dark, and quiet. The children emphasized the need to be comfortable with extra pillows and blankets, whereas only 1 parent mentioned the importance of a comfortable mattress. The children also mentioned the use of stuffed animals for comfort. Stuffed animals, blankets, pillows, and toys without entertaining music and/or lights may prove useful in providing emotional and physical support at bedtime for some school-age children. Future sleep education materials should encourage parents to consider the comfort of their children when promoting healthy sleep.

Conclusion

Many of the cognitions on sleep discussed by the parents and children in the current study fall within the context of sleep hygiene practices. General sleep hygiene concepts include reducing exposure to light and stimulation 30 minutes or more prior to bedtime (eg, powering off media, dimming lights), preparing for bedtime with a consistent routine/schedule, preparing the bedroom for sleep (eg, dark, cool, quiet/white noise, free from distraction), including physical activity during the day, and completing relaxing activities prior to bed (eg, bath, soothing smells, deep breathing, massage).

Previous evidence indicates that mothers prefer obtaining sleep advice for their children from both professionals and other parents.[82] Experience from other parents in addition to scientific evidence provides building blocks for balanced, practical guidance. These mothers indicated the need for readily available sleep advice from valid, nonjudgmental sources.[82]

Future sleep education materials targeted toward parents and children can affirm their cognitions of sleep by including academic and emotional benefits, barriers associated with technology, and consistent bedtime routines, and can normalize concerns by sharing experiences and solutions gained from parents like those in this study. Sleep education targeting parents should emphasize their role in enforcing bedtime routine rules, consistently reminding their children of the importance of adequate sleep, and ensuring that children are comfortable in an environment that is conducive to sleep. Parents should also have an opportunity to learn the potential disruptiveness of their own behaviors after they put their children to bed. Beyond the effects on mood and academic success, parents and children could benefit from learning about the importance of sleep in relation to weight management, social interactions, and physical activity levels. Sleep education materials targeting school-age children should empower them to engage in activities that will help them sleep better by practicing healthy sleep habits independent of their parents' prompting. Parents and children should be encouraged to work in collaboration and hold each other accountable in efforts to promote healthy sleep in the household.

The link between sufficient sleep and obesity prevention was not mentioned by parents, indicating that they likely are unaware of the connection. Additionally, parents listed numerous barriers to establishing and maintaining a bedtime routine. Future family-focused obesity prevention interventions should aim to raise parents' awareness of the association between adequate sleep and healthy weight status while providing suggestions for overcoming barriers to ensuring adequate sleep and emphasizing the existence of barriers to sleep identified by children and not adults.

The findings of this study are limited to those residing in the United States and are not generalizable to areas of the world with significantly different lifestyle patterns, particularly nonindustrialized nations. Additionally, these findings may not be generalizable to other age groups of children or parents of children older or younger than those in the study in the United States. Despite these limitations, this study has made important contributions to the current literature by providing an understanding of the cognitions of parents and school-age children regarding the importance of, barriers to, and strategies for sleep in children. It also provides rich insight into the verbal expressions parents and school-age children use to convey thoughts related to sleep which can be used to tailor health communications on language patterns. This information can be integrated

with evidence from scientific literature to develop practical sleep education materials, predicated on the Social Cognitive Theory,[31,32] that are designed to promote healthful sleep behavior change by parents and school-aged children.

Disclosure

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