Sleep Health 1 (2015) 15–27

Contents lists available at ScienceDirect

Sleep Health

Journal of the National Sleep Foundation

journal homepage: http://www.elsevier.com/locate/sleh

Sleep in the modern family: protective family routines for child and adolescent sleep

Orfeu M. Buxton, PhD [a,b,c,d,*], Anne-Marie Chang, PhD [a,c], James C. Spilsbury, PhD [e], Taylor Bos, BM [f], Helene Emsellem, MD [f], Kristen L. Knutson, PhD [g]

[a] Department of Biobehavioral Health, Pennsylvania State University, 221 Biobehavioral Health Building, University Park, PA 16802
[b] Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, 677 Huntington Ave, Kresge Building, Boston, MA 02115
[c] Department of Medicine, Brigham and Women's Hospital, 221 Longwood Ave, Boston, MA 02115
[d] Division of Sleep Medicine, Harvard Medical School, 221 Longwood Ave, Boston, MA 02115
[e] Center for Clinical Investigation, Case Western Reserve University, Wolstein Research Building, 2103 Cornell Rd, Cleveland, OH 44106-7291
[f] The Center for Sleep & Wake Disorders, 5454 Wisconsin Ave, Suite 1725, Chevy Chase, MD 20815
[g] Department of Medicine, University of Chicago, 5841 S Maryland Ave MC6076, Chicago IL 60637

ARTICLE INFO

Article history:
Received 21 November 2014
Accepted 2 December 2014

ABSTRACT

Study objectives: The overall objective of the 2014 National Sleep Foundation Sleep in America Poll "Sleep in the Modern Family" was to obtain a current picture of sleep in families with at least 1 school-aged child.
Design: Cross-sectional poll.
Setting: Internet-based interview.
Participants: Nationally representative Internet panel of US households with a child 6-17 years.
Measurements and results: Primary measures included parental perception of the importance of sleep, parental and child sleep quality, child sleep duration and habits, technology in bedroom, and family rules. Parents/guardians (n = 1103; mean age, 42; 54% female) completed the survey. Although the majority of parents endorsed the importance of sleep, 90% of children obtain less sleep than recommended. Significant predictors of age-adjusted sufficient sleep duration (estimated conservatively as ≥9 hours for ages 6-11 years and ≥8 hours for ages 12-17 years) included parent education, regular enforcement of rules about caffeine, and whether children left technology on in their bedroom overnight. Significant predictors of excellent sleep quality included whether a bedtime was always enforced and whether children left technology on overnight.
Conclusions: Children generally have better age-appropriate sleep in the presence of household rules and regular sleep-wake routines. Sufficient sleep quantity and adequate sleep quality were protected by well-established rules of sleep hygiene (limited caffeine and regular bedtime). In contrast, sleep deficiency was more likely to be present when parents and children had electronic devices on in the bedroom after bedtime. Public health intervention goals for sleep health might focus on reducing the encroachment of technology and media into time for sleep and supporting well-known sleep hygiene principles.

Introduction

An important consequence of our modern-day, 24/7 society is that it is difficult for families—children and caregivers both—to get adequate sleep. Sleep in the family context frames sleep as involving reciprocal interactions between all members of a household and interactions with the environment of the home as well as exogenous factors affecting any member.[1,2] Several potential reasons include the use of technology in the bedroom,[3-5] complicated and busy daily schedules with competing work, school, social, and recreational activities, as well as neighborhood noise from vehicular traffic, commercial, or industrial activity and neighbors.[6,7] A variety of demographic factors are predictors of adolescent sleep, including ethnoracial group and socioeconomic status,[8] nativity/acculturation,[9] family structure,[10] and perceived social status.[11] In the family dynamic, a consistent bedtime routine improves sleep,[3] whereas television use in the bedroom generally curtails sleep.[5]

Good quality and sufficient sleep are vital for children. Just like a healthy diet and exercise, sleep is critical for children to stay healthy, grow, learn, do well in school, and function at their best.[2] Some of the primary consequences of poor sleep among children and adolescents are behavioral problems, impaired learning and school performance, sports injuries,[12] mood and emotional regulation,[13,14] and worse

* Corresponding author at: Pennsylvania State University, 219 Biobehavioral Health Building, University Park, PA 16802. Tel.: +1 617 507 9177.
E-mail address: Orfeu@PSU.edu (O.M. Buxton).

http://dx.doi.org/10.1016/j.sleh.2014.12.002
2352-7218/

health including obesity.[15-17] Evidence also indicates that in adolescence lack of sleep may be related to high-risk behaviors such as substance use, suicidal behaviors, and drowsy driving.[18] In addition, recent studies have found that greater media use was associated with a higher body mass index, and this association was partly due to reduced sleep time in UK[19] and Canadian adolescents.[20]

The overall objective of the 2014 National Sleep Foundation Poll "Sleep in the Modern Family" was to obtain a contemporary picture of sleep in families with at least 1 school-aged child. We were interested in parental perception of the importance of sleep duration and sleep quality, habits and routines of the families and children, and obstacles preventing adequate sleep. A strategic priority of Healthy People 2020[21] is to increase the proportion of people obtaining sufficient sleep duration. To do so, a recent task force identified objectives including "Support basic and translational research to identify causal and interacting relationships and mechanisms underlying the impact of sleep deficiency on health throughout the lifespan; and establish normative age- and gender-specific data for sleep duration, sleep quality and circadian timing using both self-reported and objective sleep and circadian phenotyping in studies that include analysis of diverse ethnic and socioeconomic groups."[22]

The specific objectives of this poll were thus to examine the following topics:

1. Parents' perception of the importance of sleep for their own and their children's health and well-being.
2. The sleep quality of both parents and children.
3. The methods and practices parents and their children use to help them sleep.
4. The sleep habits of children on school days and nonschool days.
5. The presence and impact of various types of electronic devices in parents' and children's bedrooms and the frequency with which they are left on at night.
6. The factors that make it more difficult for both the parent and the child to sleep.
7. How regularly scheduled bed times, wake times, and meal times occur day-to-day for both parents and children.
8. The prevalence and enforcement of rules around sleep and their relationship with child's sleep.

Methods

Overview

The 2014 Sleep in America Poll was sponsored and funded by the National Sleep Foundation (www.sleepfoundation.org), which does not solicit or accept corporate support for its annual Sleep in America Poll; its polls are developed by an independent task force of sleep scientists who provide guidance and expertise in developing the poll questionnaire as well as providing the analysis of the data. The current poll questions were developed by a Task Force convened by the National Sleep Foundation (Buxton, Ensellem, Montgomery-Downs, LeBourgeois, Spilsbury) and the National Sleep Foundation Poll Scholar (Kristen Knutson), as well as a poll mentor (D. Sunshine Hillygus, PhD, Duke University).

Survey procedures

The National Sleep Foundation commissioned Mokrzycki Survey Research Services (West Newbury, MA) to conduct a national survey of caregivers with a child aged 6-17 years living in their household to ask about sleep practices and beliefs. Field work was conducted between December 12 and 23, 2013, by GfK Group (Knowledge Networks, New York, NY). The sample was drawn randomly from GfK's probability-based online KnowledgePanel, which is designed to be representative of the US population.[23,24] This panel was recruited randomly using address-based sampling, which is based on the US Postal Service's Delivery Sequence File and is estimated to be representative of 97% of US households. For this survey, 4027 panel members were randomly drawn from GfK's KnowledgePanel. Of these, 1441 (excluding breakoffs or incomplete attempts) responded to the invitation, while 1109 qualified for the survey, yielding a final stage completion rate of 35.8% and a qualification rate of 77.0%.

The survey instrument (Table 1) was administered via the Internet. GfK provided a laptop and Internet connection at no cost to panel recruits if they did not have access already. The survey median completion time was 11 minutes. Both English and Spanish versions were available to the respondents.

Participants

The objective of this poll was to survey parents or guardians with at least 1 child aged 6-17 years living in the household. The survey confirmed this information with the following questions: (1) First, would you please confirm that there is at least 1 child age 6-17 living in your household? (2) Would you say you have parental responsibility for [this child]? Relationship to the child was also queried with the question, "Which of these best describes your relationship to [this child]" with the response options: parent (biological or adoptive), stepparent or legal guardian, partner of child's parent, sibling, or other (specified). Note that a response of "sibling" terminated the survey as siblings were not eligible. Finally, if the respondent had >1 child aged 6-17 years, the computer randomly chose one to be the subject of questions in this survey.

The final sample included 1103 parents. Sampling error for estimates from full sample was ±4.0 percentage points, including adjustment for sample design effect. Survey results were weighted in 2 stages. First, before the study sample was drawn, the overall panel was adjusted to demographic distributions from the most recent Current Population Survey.[24] Weighting variables included gender, age, race/ethnicity, education, household income, geographic region, metropolitan area status, and Internet access. Second, after the study sample was finalized, a set of study-specific poststratification weights were constructed so that the study data could be adjusted for the study's sample design and for survey nonresponse. The following benchmark distributions are used for the poststratification adjustment: gender (male/female); age (18-29, 30-44, 45-59, and 60+ years); race/Hispanic ethnicity (white/non-Hispanic, black/non-Hispanic, other/non-Hispanic, 2+ races/non-Hispanic, Hispanic); education (less than high school, high school, some college, bachelor, and beyond); Census region (Northeast, Midwest, South, and West); household income (under $25 K, $25 K to <$50 k, $50 K to <$75 k, $75 K and above); metropolitan area (yes, no); Internet access (yes, no); primary language (non-Hispanic, Hispanic English proficient, Hispanic bilingual, Hispanic Spanish proficient).

Measures

Demographic variables collected within this panel included the age, sex, race/ethnicity, educational level, and marital status of the parental respondent, as well as the household size, household income; whether the household had access to Internet; whether the respondent rents or owns their home; and the housing type, including the structure type, for example, 1-family house detached from any other house, 1-family house attached to ≥1 houses, a building with ≥2 apartments, a mobile home, boat, recreational vehicle, or van as home. Information on whether the respondent lives in a metro or nonmetro area and the region of the country is also available.