



Interactive vs passive screen time and nighttime sleep duration among school-aged children

Jennifer Yland, BA Candidate ^a, Stanford Guan, MPH ^b, Erin Emanuele, MPH ^b, Lauren Hale, PhD ^{c,*}

^a Duke University, Raleigh, NC

^b Program in Public Health, Stony Brook University, Stony Brook, NY

^c Department of Family, Population, and Preventive Medicine, Program in Public Health, Stony Brook University, Stony Brook, NY

ARTICLE INFO

Article history:

Received 17 February 2015

Received in revised form 22 June 2015

Accepted 24 June 2015

Keywords:

Sleep
Screentime
Media
Television
Computer
Video games
Pediatrics
Bedtime

ABSTRACT

Background: Insufficient sleep among school-aged children is a growing concern, as numerous studies have shown that chronic short sleep duration increases the risk of poor academic performance and specific adverse health outcomes. We examined the association between weekday nighttime sleep duration and 3 types of screen exposure: television, computer use, and video gaming.

Methods: We used age 9 data from an ethnically diverse national birth cohort study, the Fragile Families and Child Wellbeing Study, to assess the association between screen time and sleep duration among 9-year-olds, using screen time data reported by both the child ($n = 3269$) and by the child's primary caregiver ($n = 2770$).

Results: Within the child-reported models, children who watched more than 2 hours of television per day had shorter sleep duration by approximately 11 minutes per night compared to those who watched less than 2 hours of television ($\beta = -0.18$; $P < .001$). Using the caregiver-reported models, both television and computer use were associated with reduced sleep duration. For both child- and parent-reported screen time measures, we did not find statistically significant differences in effect size across various types of screen time.

Conclusions: Screen time from televisions and computers is associated with reduced sleep duration among 9-year-olds, using 2 sources of estimates of screen time exposure (child and parent reports). No specific type or use of screen time resulted in significantly shorter sleep duration than another, suggesting that caution should be advised against excessive use of all screens.

© 2015 National Sleep Foundation. Published by Elsevier Inc. All rights reserved.

Introduction

Insufficient sleep among school-aged children is associated with an increased risk of poor academic performance,^{1–4} obesity,^{5–9} and depression.^{10–13} Furthermore, if short sleep duration continues throughout childhood, its associations with heightened depressive symptoms and low self-esteem strengthen.¹⁴ Inadequate sleep duration among young children and adolescents in the United States is common and growing.¹⁵ According to the 2014 National Sleep Foundation poll, 31% of school-aged children aged 6 to 11 years receive less than the recommended 9 hours of sleep.¹⁶

The overwhelming majority of studies indicate that screen time or electronic media use is associated with lower sleep duration, delayed bedtimes, or other sleep disturbances among school children.^{17,18} American children between ages 8 and 18 years spend an average of 7 hours per day in front of a screen.^{19,20} Results from the 2014

National Sleep Foundation poll found that 75% of school-aged children have at least 1 electronic device in their bedroom. This includes a television (45%), a music player (40%), a tablet or smartphone (30%), a video game (25%), or a computer (21%).¹⁶ A study by Calamaro et al²¹ found that children ages 6 to 11 years who have at least a television, a telephone, and a computer in their bedroom receive 45 minutes less sleep, compared to those who have no technology devices in their bedroom. Congruently, Cespedes et al²² analyzed screen time in a longitudinal study of 7-year-olds and found that each additional hour of television watching per day was associated with 6 minutes of shorter sleep duration. Another study found that among children aged 6 to 16 years, watching television and using the computer for more than 2 hours per day were both significantly associated with short sleep duration, with the effect size being greater for computer use.²³ Furthermore, among 10- and 11-year-olds, using a computer for 1 hour per day was associated with approximately 11 minutes less sleep per night on school nights over an 18-month period in another study.²⁴ Beyond the use of individual screen types, the effects of aggregate screen time have been studied. Drescher et al²⁵

* Corresponding author.

E-mail address: lhale@sleepfoundation.org (L. Hale).

measured the amount of time per day spent watching television, playing video or computer games, and using the Internet and found aggregate screen time to be significantly associated with shorter sleep duration among children younger than 13.3 years.

Previous scholars have hypothesized that interactive screen time, such as video gaming and Web surfing, is more likely to be disruptive to sleep than noninteractive screen time, such as watching television.²⁶ One such study showed that elementary school children who played video games or used the Internet at bedtime had significantly shorter weekday sleep duration compared to those who did not use video games or surf the Internet before bed, whereas no such association was reported among those who watched television at bedtime compared to those who did not watch television at bedtime.²⁷ However, there are very few studies that compare interactive and noninteractive screen time with regard to bedtime sleep duration, especially among school-aged children.^{23,26,27} Studies often only provide results for 1 or 2 types of screen time at a time or use a combined measure of overall screen time. Furthermore, a majority of the evidence on screen time and sleep duration among children focuses on television and computer use and often does not include video gaming.¹⁷ These results, among others, indicate that multiple types of media, ranging on a spectrum of interactivity, are associated with shorter sleep duration among school-aged children.^{28–30}

In the present study, we analyzed the association between various types of screen time and average weekday sleep duration among a large national sample of 9-year-olds. Our data were novel in that we had both parent reports and child reports on screen time exposure and were able to separate out the different forms of screen types. We hypothesized that use of any form of electronic media would be negatively associated with sleep duration. Furthermore, we expected that the strength of the association would vary based on the level of interactivity of the screen type. More specifically, we hypothesized that interactive forms of screen time, such as computer use and video gaming, would be associated with shorter bedtime sleep duration compared to passive forms of screen time, such as watching television.

Methods

Participants

The data used in this study were collected in the Fragile Families and Child Wellbeing (FFCW) Study, conducted jointly by Princeton University's Center for Research on Child Wellbeing and Center for Health and Wellbeing, and the Columbia Population Research Center and The National Center for Children and Families at Columbia University. The FFCW is a longitudinal cohort study that has followed approximately 5000 children, born between 1998 and 2000, since birth. Data were collected in 20 cities with populations of at least 200,000 across the United States. The sample was designed to include a high number of unmarried parents and racial minorities, along with a high proportion of low socioeconomic status. Reichman et al³¹ provide a complete description of the FFCW, including the research design and limitations.

Families were recruited at birth in hospitals, and mothers were screened for eligibility. The inclusion criteria to participate in the study entailed that (1) the mother intended to keep the focal child, (2) she was proficient enough in English or Spanish and healthy enough to answer the survey questions, and (3) the father was still alive. These inclusion criteria disqualified less than 5% of mothers. In addition, because of legal constraints, in approximately half of the hospitals, parents of the focal child had to be at least 18 years of age to be eligible to participate. However, this had only a minimal impact on the sample.³¹

Interviews were conducted at baseline with the mothers and fathers in person at the hospitals, and subsequent follow-up interviews were conducted over the telephone at 12, 36, and 60 months of age. The study was expanded for the age 9 wave of data and included interviews with the primary caregiver, the focal child, and the focal child's teacher, as well as in-home observations. At each wave, substantial information was collected regarding family structure and relationships, parent and child behavior, access to resources, physical and mental health and development, and home and school environment.

Measures

We used data from the primary caregiver (PCG) surveys and the child interview within the age 9 data. Sleep was reported as hours per night on weekdays by the PCG. General daily screen time, as reported by the PCG, was measured continuously from 0 to 16 hours per day for both television and computer usage separately. Television use was reported as average time on both weekdays and weekends, whereas computer time was nonspecific regarding weekdays and weekends. We chose to only analyze duration of television watching on weekdays, to agree with the data on weekday sleep, along with using general duration of computer use.

In the child interview, the focal child self-reported his or her average time on weekdays using the computer for school work, using the computer for chatting, playing video games, and watching television or movies. Response options included (1) "half an hour or less," (2) "more than half an hour but less than an hour," (3) "1–2 hours," and (4) "more than 2 hours." Based on our assessment of the distribution of screen time and on our preliminary analyses showing that the lower 3 levels of screen time were not differentially associated with sleep duration, we dichotomized the screen time categories into less than or more than 2 hours per day, for each type of screen time. This cutoff is in agreement with the 2-hour daily limit on media use recommended by the American Academy of Pediatrics.³²

Additional covariates obtained from the mother's survey at baseline included sex, race, parental relationship, and mother's education. Sex was categorized as male or female; race was categorized as white non-Hispanic, black non-Hispanic, Hispanic, or other; parental relationship was categorized as married, cohabiting, visiting, friendly, hardly talk, never talk, or unknown father; and mother's education was categorized as less than high school, equivalent to high school, some or technical college, and college graduate. Within parental relationship, we consolidated visiting and friendly and hardly talk, never talk, and unknown father. We also combined the categories of less than high school and education equivalent to high school, within the mother's education variable. We chose to combine these categories based on the distribution of the data and our initial analyses.

Finally, we merged the data and omitted cases that did not contain full information for all variables of interest. We omitted 1629 and 2128 cases from the child-reported and PCG-reported models, respectively. We retained 66.7% of the baseline sample for the child-reported model and 56.6% for the PCG-reported model. Given the relatively large sample size, we justify using listwise deletion because most of the variable means were the same for the included sample as for the omitted sample.³³ Furthermore, most of the missing data were from our dependent variable of sleep duration and our primary predictor variable of screen time use. Typically, there are limited benefits to imputing the outcome variable,³⁴ and we do not want to introduce additional measurement error for the screen time exposure measure. Within the child-reported model, there were no differences between groups for sleep duration, any screen time variables, sex, or mother's education. Within the PCG-reported models, weekday nighttime sleep duration was approximately 12 minutes less for the omitted group ($P < .001$). The omitted group also watched

Download English Version:

<https://daneshyari.com/en/article/916269>

Download Persian Version:

<https://daneshyari.com/article/916269>

[Daneshyari.com](https://daneshyari.com)