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Sleep health among U.S. Hispanic/Latinx children: An examination of correlates of meeting sleep duration recommendations

Emily A. Schmied, PhD^{a*}, Kelsie M. Full, PhD^b, Shih-Fan Lin, DrPH^c,
Petrona Gregorio-Pascual, MA^d, Guadalupe X. Ayala, PhD, MPH^e

^a School of Public Health, San Diego State University, and Institute for Behavioral and Community Health, San Diego State University Research Foundation, San Diego, California, USA

^b Division of Epidemiology and Community Health, University of Minnesota School of Public Health, Minneapolis, Minnesota, USA

^c Institute for Behavioral and Community Health, San Diego State University Research Foundation, San Diego, California, USA

^d San Diego State University & University of California, San Diego Joint Doctoral Program in Public Health, and Institute for Behavioral and Community Health, San Diego State University Research Foundation, San Diego, California, USA

^e School of Public Health, San Diego State University, and Institute for Behavioral and Community Health and SDSU HealthLINK Center, San Diego State University Research Foundation, San Diego, California, USA

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ABSTRACT

Objectives: The objective of this study was to examine the association between sociodemographic, behavioral, and environmental factors and adherence to sleep duration recommendations among 1165 U.S. Hispanic/Latinx children.

Methods: In this cross-sectional study, the following parent-reported variables were examined as correlates of whether children met age-appropriate nightly sleep duration recommendations: caretaker and child demographics (eg, gender, age, poverty level), presence of TV in child's bedroom, child's daily screen time and bedtime.

Results: Most (61.4%) children (mean age: 6.39 years, SD = 2.66) met sleep duration guidelines. Multivariable regression results revealed the odds of meeting recommendations were significantly higher among children 6–12 years old living above the poverty threshold (odds ratio [OR] = 1.57; 95% confidence interval [95%CI]: 1.08, 2.31) and those with a regular bedtime (“Some of the time:” OR = 2.05; 95%CI: 1.07, 3.92; “Most of the time:” OR = 3.19; 95%CI: 1.77, 5.74; “Always:” OR = 4.46; 95%CI: 2.43, 8.13).

Conclusions: Sleep health disparities must be addressed through culturally and contextually appropriate interventions that combine individual-level strategies with those that address social and environmental factors.

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Introduction

Obtaining sufficient, quality sleep is critical to the health and development of children and adolescents.¹ However, many children fail to meet sleep duration recommendations and pronounced racial and ethnic sleep health disparities have been observed.^{2,3} Shorter durations and poorer quality sleep are frequently reported among U.S. Hispanic/Latinx children compared to children from several other racial/ethnic groups.^{2–5} For instance, data from the 2016 to 2018 National Survey of Children's Health showed 42.4% of Hispanic children aged 3–5 and 43.3% aged 6–12 experienced short sleep duration

vs. 27.9% and 30.1%, respectively, of non-Hispanic White children and 32.3% and 34.8%, respectively, of those identifying as either Asian, Native American, Alaskan, or Hawaiian, or multiracial.²

To develop strategies to improve sleep health among children, it is important to identify influential factors. Increasingly, evidence suggests child sleep health is impacted by a myriad of factors, including both parent and child characteristics and behaviors, and social and environmental factors.⁴ For example, healthier sleep is frequently reported among younger children and among those whose parents have higher levels of education.^{5,7} Certain behaviors, including greater screen time^{6,8} and inconsistent bedtimes or bedtime routines,^{9–12} as well as lack of parental monitoring of those behaviors,¹³ are also linked to shorter sleep durations among children. Additionally, characteristics of the home environment, such as availability of televisions/screens,¹⁴ and socioeconomic indicators, such as

*Corresponding author: Emily A. Schmied, PhD, School of Public Health, San Diego State University, and Institute for Behavioral and Community Health, San Diego State University Research Foundation, 5500 Campanile Dr., San Diego, CA 92182, USA.

E-mail address: eschmied@sdsu.edu (E.A. Schmied).

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household income and parent employment status,^{15,16} have been inversely associated with child sleep health. However, most of the existing research on child sleep health may not generalize to minoritized racial or ethnic communities, such as the U.S. Hispanic/Latinx community, as few studies^{5,17,18} included focused analyses of influences on sleep health among young Hispanic/Latinx children or examined whether the associations differed by race/ethnicity. As some evidence suggests, sleep hygiene behaviors (eg, keeping regular bedtimes) differ across racial and ethnic groups;^{14,15,19,20} thus, more research is needed to elucidate the potential factors associated with sleep health, including among U.S. Hispanic/Latinx families.

There is an urgent need to address sleep health disparities experienced by U.S. Hispanic/Latinx children. While previous studies have identified potential risk factors for poor sleep health among children generally, few have conducted focused examinations within U.S. Hispanic/Latinx communities. In this brief report, we address these gaps by examining the association between caregiver-reported sociodemographic, behavioral, and environmental factors and adherence to sleep duration recommendations among a sample of 1165 U.S. Hispanic/Latinx children.

Methods

Study design and participants

A convenience sample of baseline data from children and parents who were part of the California Childhood Obesity Research Demonstration (CA-CORD) study²¹ were analyzed for this cross-sectional study. CA-CORD was multi-level, multi-sector intervention that targeted 4 key health behaviors, including sleep; the full design is reported elsewhere.²¹ CA-CORD was conducted in the US-Mexico border-region of Imperial County, California. Children meeting the following criteria, and their primary caregiver, were eligible to participate: aged 2–12 years, body mass index (BMI) >fifth percentile, no pre-existing medical conditions that would limit their ability to complete intervention activities. Following enrollment, caregivers completed a baseline interview with bilingual research staff regarding their child's health, health behaviors targeted in the intervention (eg, sleep), factors hypothesized to be related to the 4 health behaviors of interest, and other characteristics. Children's height and weight were also measured at baseline. One thousand one hundred eighty-six children enrolled in CA-CORD, but because the focus of this study was Hispanic/Latinx health, participants not identifying as Hispanic/Latinx were excluded, leaving 1165 children and 834 caregivers (94.9% parents, 5.1% grandparents/other caretakers) for the present analysis; of the 834 caregivers, 331 (39.2%) had more than one child in the study. Study procedures, including those pertaining to administering and ensuring informed consent from participants, were approved by the Institutional Review Board at San Diego State University.

Measures

Child's sleep duration was assessed by asking caregivers to estimate the average number of hours and minutes their child slept on a typical weekday over the past week. Using National Sleep Foundation²² recommendations, children were categorized into 3 groups based on whether they met age-appropriate recommendations: <3 years old: 11–14 hours; 3–5 years: 10–13 hours; 6–12 years: 9–11 hours.

Child's regular bedtime was assessed by asking caregivers "Does your child have a regular weekday bedtime?" Response options included: "none of the time" (0), "some of the time" (1), "most of the time" (2), and "always" (3).

To assess *child's screen time*, caregivers reported how many hours in a typical weekday in the past week their child spent watching TV/DVDs, and separately playing video/computer games; items were summed for total hours for a typical day.

Presence of a TV in child's bedroom was assessed by asking caregivers if there was a TV in the room where the child sleeps (yes/no).

*Screen-time Limit Setting*²³ was measured by asking caregivers their agreement with the statement, "I limit the amount of time my child watches TV or videos to 2 hours or less per day."²³ Response options ranged from 1 (disagree) to 5 (agree).

Personal and household characteristics. Child age and gender were obtained by the caregiver. For analyses, child age was trichotomized into the following groups to coincide with clinical sleep duration recommendations:²² 2 years old, 3–5 years old, 6–12 years old. *Child's BMI percentile* was identified using standard growth charts after computing raw BMI from height (cm) and weight (kg) ([kg]/height[m]²). Caregiver age, education (<high school diploma/≥high school diploma/equivalent), marital status (married/unmarried), employment (employed/unemployed), years lived in the United States, and number of children living in the household, were also assessed.

Poverty was measured using family income-to-poverty ratio. The poverty cutoff values used to calculate the income-to-poverty was obtained from the U.S. Department of Health and Human Services' 2011 poverty guidelines.²⁴ A ratio greater/lower than 1 indicated the income was above/below poverty level.

Statistical analyses

Descriptive characteristics were computed for all variables. To determine which factors were associated with meeting sleep duration recommendations multivariable logistic regression models

Table 1

Caregiver and child characteristics and child sleep behaviors (N = 1165 children, N = 834 caregivers)

Characteristics	n (%) or Mean (SD)
Caregivers N = 834	
Age, y (range: 19–74)	35.71 (8.47)
Female	820 (98.3%)
Living below poverty line	762 (69.1%)
Employed outside the home	330 (39.6%)
Hispanic/Latinx	822 (98.7%)
Education	
Less than high school	263 (31.6%)
High school or higher	569 (68.4%)
Marital status	
Married/cohabitating	607 (73.1%)
Not married/divorced	223 (26.9%)
Years lived in USA (range: 0.2–74)	20.10 (12.25)
Children in household (range: 1–8)	2.65 (1.14)
Children N = 1165	
Age, y (range: 2–12)	6.39 (2.66)
Female	590 (50.6%)
BMI percentile (range: 4–100)	76.49 (26.34)
Meets sleep duration recommendations	714 (61.4%)
Daily hours of screen time (range: 0–18)	3.32 (2.35)
Has TV in the bedroom	798 (68.5%)
Caregiver limit daily screen time	
Disagree	152 (13.1%)
Slightly disagree	81 (7.0%)
Neutral	157 (13.5%)
Slightly agree	156 (13.4%)
Agree	618 (53.1%)
Have a regular bedtime	
None of the time	115 (9.9%)
Some of the time	201 (17.3%)
Most of the time	438 (37.6%)
Always	410 (35.2%)

including all hypothesized variables were conducted. Because sleep recommendations, as well as developmental stage and parenting strategies, vary by child age group, models were stratified by age (2 years old; 3–5 years old; 6–12 years old). As up to 2 children from the same family could be enrolled in CA-CORD, mixed models were computed to adjust for family clusters; however, large estimates with wide 95% confidence intervals were found in these models, indicating poor fit. Logistic models without family cluster adjustments were also conducted and showed consistency in terms of test statistics and *p*-values, and thus, odds ratios [OR] and 95% confidence [95%CI] intervals from these models were reported here. Analyses were computed using IBM SPSS version 26.0 (Armonk, NY) and STATA 16.1.

Results

Table 1 includes personal and household characteristics, children's sleep health, and factors hypothesized to relate to meeting sleep duration recommendations. Approximately two-thirds (61.4%) of all children met sleep duration recommendations, but there was some variation across age groups. Nearly half of 2-year old children (*n* = 106; 48.1%), and two-thirds of 3–5 year old (*n* = 346; 61.6%) and 6–12 year old (*n* = 711; 63.3%) children met the recommended sleep

duration for their age.²² In multivariable analysis including all variables (Table 2), factors that were significantly associated with meeting sleep duration recommendations were only identified among the oldest age group. Among the children aged 6–12, the odds of meeting sleep duration recommendations were over one and a half times as high among children living above the poverty threshold than among those living in poverty (OR = 1.57; 95%CI: 1.08, 2.31). Additionally, children whose caregivers reported having a regular bedtime were significantly more likely to meet recommendations when compared to those who did not ("Some of the time:" OR = 2.05; 95%CI: 1.07, 3.92; "Most of the time:" OR = 3.19; 95%CI: 1.77, 5.74; "Always:" OR = 4.46; 95%CI: 2.43, 8.13).

Discussion

Sleep health disparities are pervasive within the United States and may contribute to serious health disparities²⁵, indicating a need to address factors that influence sleep among minoritized racial and ethnic groups. This study provides much needed information about the sleep health of a large sample of rural, border-residing U.S. Hispanic/Latinx children, a group that has been underrepresented in research. Results showed that, similar to the prevalence rates

Table 2
Factors associated with meeting sleep recommendations among participating children, stratified by age group (N = 1165 children)

	2 y old N = 106	3–5 y old N = 347	6–12 y old N = 712
	OR (95%CI)		
Children			
Gender			
Female	-	-	-
Male	1.71 (0.66, 4.41)	1.18 (0.73, 1.91)	0.91 (0.65, 1.27)
BMI percentile	1.04 (0.99, 1.08)	0.99 (0.98, 1.01)	0.99 (0.99, 1.01)
Daily hours of TV screen time	1.01 (0.78, 1.31)	0.93 (0.84, 1.04)	0.99 (0.92, 1.07)
TV in the bedroom			
No	-	-	-
Yes	1.37 (0.51, 3.74)	0.71 (0.42, 1.19)	0.95 (0.66, 1.38)
Caregiver limit daily screen time			
Disagree	-	-	-
Slightly disagree	2.93 (0.30, 28.39)	0.53 (0.16, 1.71)	1.45 (0.68, 3.07)
Neutral	1.33 (0.15, 11.63)	0.91 (0.34, 2.43)	1.29 (0.68, 2.46)
Slightly agree	0.89 (0.09, 8.28)	1.08 (0.43, 2.74)	1.03 (0.54, 1.97)
Agree	1.17 (0.16, 8.40)	0.55 (0.25, 1.17)	1.07 (0.64, 1.81)
Have a regular bedtime			
None of the time	-	-	-
Some of the time	0.42 (0.06, 2.70)	1.67 (0.69, 4.21)	2.05 (1.07, 3.92)*
Most of the time	0.28 (0.05, 1.57)	1.41 (0.61, 3.28)	3.19 (1.77, 5.74)***
Always	0.57 (0.10, 3.23)	1.72 (0.73, 4.09)	4.46 (2.43, 8.15)***
Caregiver			
Age	0.96 (0.89, 1.05)	1.00 (0.97, 1.03)	1.00 (0.98, 1.02)
Poverty status			
Below threshold	-	-	-
Above threshold	1.76 (0.55, 5.64)	1.36 (0.76, 2.42)	1.57 (1.08, 2.31)*
Employment status			
Unemployed	-	-	-
Employed	0.74 (0.26, 2.06)	0.67 (0.40, 1.12)	1.08 (0.77, 1.53)
Education			
Less than high school	-	-	-
High school or more	2.55 (0.74, 8.79)	0.90 (0.51, 1.59)	0.81 (0.55, 1.17)
Marital status			
Unmarried	-	-	-
Married/cohabitating	0.83 (0.24, 2.88)	0.84 (0.51, 1.59)	1.22 (0.83, 1.80)
Total children in household	0.94 (0.61, 1.43)	1.11 (0.89, 1.38)	1.10 (0.94, 1.30)
Years lived in USA	0.95 (0.91, 1.00)	0.99 (0.97, 1.02)	1.00 (0.99, 1.02)

OR, odds ratio; CI, confidence interval.

* *p* < .05.

***p* < .01.

*** *p* < .001.

reported in the National Survey of Children's Health,² nearly two-thirds of children met sleep duration recommendations. An examination of factors associated with meeting the recommendations revealed both behavioral and social factors may play a role within certain age groups. Of the factors examined, maintaining a regular weekday bedtime had the strongest association with meeting sleep duration recommendations, a finding that aligns with previous research conducted among young children and adolescents.^{11,12} As maintaining a regular bedtime is a potentially modifiable behavior, this strengthens the existing support for interventions designed to teach parents and children how to develop healthy bedtime routines.^{26,27} This strategy may be particularly important among Hispanic/Latinx families, as research has shown that they may be less likely to maintain a regular bedtime and/or bedtime routine than children from other racial/ethnic groups.^{15,20} Further, given that sleep duration and the association with having a bedtime differed by age group in this study, interventions may need to be tailored based on the child's age. This result also supports the importance of assessing the sleep health and sleep hygiene-related behaviors, including bedtimes, of pediatric patients.

Additionally, participating children ages 6–12 living below the poverty threshold faced nearly twice the odds of not meeting sleep duration recommendations. The link between poverty and poor sleep health has been observed previously,¹⁶ but more research regarding influential mechanisms is needed, particularly among children. Some evidence suggests aspects of the home and physical environment related to living in poverty may mediate the relationship, including parental involvement, psychosocial factors (eg, stress), ambient sound and/or light, crowding, and poorer air quality.^{28,29} It is important for researchers and healthcare providers to consider contextual factors that may influence sleep health among low-income Hispanic/Latinx children so that tailored, multi-level intervention strategies, including those designed for implementation within clinical settings, can be developed and successfully implemented.

Strengths of this study include the focus on Hispanic/Latinx children, the robust sample size, and the examination of multiple factors that may impact sleep health. Limitations include the reliance on a subjective measure of sleep duration and the lack of data on other factors that could impede sleep, including psychosocial (eg, stress) and environmental factors (eg, ambient sound and light), and other social experiences such as racism and/or discrimination.³⁰ Further, the cross-sectional design prohibits causal inference. Future studies should include objective assessments of sleep and use longitudinal designs to examine the interactions between individual, social, and environmental risk factors for adverse sleep health outcomes.

These results add to our understanding of the unique challenges U.S. Hispanic/Latinx children experience obtaining healthy sleep, while also highlighting positive sleep hygiene behaviors exhibited by these families (eg, regular bedtimes). While more research is needed within this population, as well as among other minoritized racial and ethnic groups, this study supports the notion that sleep health disparities must be addressed through culturally and contextually appropriate interventions that combine educational and behavioral interventions with those that address social and environmental factors.^{31,32}

Declaration of conflict of interest

None for any author.

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