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Assessing sleep behaviors in Latino children and adolescents: what is known, what are we missing, and how do we move forward?

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Abstract

Purpose of review—Sleep health is a commonly overlooked component of pediatric cardiometabolic risk. Disparities in sleep duration and meeting of pediatric sleep guidelines have been well documented among at-risk populations in the United States, including Latinos. However, sleep research often fails to describe or account for contextual and cultural factors impacting the ability for Latino families to meet guidelines. The current review focuses on recent findings related to measurement of sleep duration, understanding of contextual factors that impact sleep hygiene, and interventions designed to increase sleep duration and quality among U.S. Latino families with infants, young children, and adolescents.

Recent findings—Ten studies focusing on sleep health in U.S. Latino children, using different study designs were identified. Overall, cross-sectional studies confirmed inadequate sleep among Latino children, intervention studies demonstrated promise of culturally-sensitive health behavior education for improving sleep in early childhood, and qualitative studies highlighted neighborhood and cultural factors that impact sleep quality.

Implications for clinical practice and research—Rather than new prevalence studies on adherence to sleep recommendations among Latino families, research focusing on adapting clinical guidelines to accommodate the realities of many Latino families (e.g., co-sleeping and bedsharing) will advance our knowledge. A shift towards objective measurement of the 24-h period as well as evaluating specific contextual barriers that make It challenging to meet sleep guidelines for Latino children is needed.

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Conflicts of interest

There are no conflicts of interest.

Keywords

Latino children; sleep disparities; sleep health; U.S. Latino population

INTRODUCTION

Latinos, or persons who identify as being from or having Latin American origins or descent [1], are the fastest growing U.S. ethnic or racial group and comprise about 20% of the population of the United States (U.S.) [2]. As the U.S. Latino population grows, cardiometabolic risk among Latinos has grown as a public health concern, particularly among young Latinos. According to 1999–2018 National Health and Nutrition Examination Survey data, self-identified as Mexican American and Hispanic youth have the highest prevalence of several cardiometabolic risk factors, including elevated waist circumference, blood glucose, and triglyceride levels, across all U.S. racial and ethnic groups [3]. Cardiometabolic risk factors established in childhood tend to track into adulthood [4] and this is reflected in Hispanic adults also exhibiting high prevalence of obesity [5], type 2 diabetes [6], and high cholesterol [7], placing them at higher risk for cardiovascular disease. As such, increased emphasis has been placed on promoting ideal cardiovascular health in Latino youth. In 2010, the American Heart Association defined components of ideal cardiovascular health as Life's Simple 7, which included the following health behaviors and health factors: avoiding nicotine, sufficient physical activity, maintaining a healthy diet and weight, and maintaining healthy levels of blood lipids, blood glucose, and blood pressure [8]. More recently, the American Heart Association enhanced the framework by incorporating sleep health as a component of Life's Essential 8 for cardiovascular health, though historically this health behavior has received less attention than, for example, physical activity or diet [9■■]. Understanding the long-lasting effects of sleep and how to intervene is necessary to reduce cardiometabolic risk in Latino youth. However, while addressing sleep health has potential to lower cardiometabolic risk, sleep measurement in Latino children is challenging and current data on sleep health in this population are scarce.

Pediatric sleep health is a multidimensional construct that encompasses domains such as patterns (e.g., duration and efficiency), subjective quality, alertness, and related behaviors (e.g., bedtime schedule and routines, and bedtime electronic device usage) [10,11]. The American Academy of Sleep Medicine provides age-specific sleep duration recommendations to promote optimal health [12], ranging from 12 to 16 h (including naps) for infants to 8–10 h for children ages 13–18 years. Unfortunately, the 2016–2018 National Survey of Children's Health showed just over 40% of U.S. Hispanic children aged 3 to 12 years do not achieve the recommended amount of sleep [13]. Obtaining sufficient, quality sleep is essential for healthy development in pediatric populations. Thus, the high prevalence of inadequate sleep duration among Latino youth is a public health problem. Children who do not get sufficient, quality sleep are at increased risk for many health conditions, including obesity [12]. From 2017 to 2020, the prevalence of obesity among Hispanic children was 26%, which was among the highest of any racial and ethnic group measured [14]. As such, interventions that focus on improving sleep behaviors among Latino children may be effective in lowering obesity rates in this group.

Currently, domains of pediatric sleep health other than sleep duration are not routinely captured in surveillance systems and data on Latino pediatric sleep health are limited. While objective measures of sleep health exist, most research does not capture all domains (e.g., efficiency and quality) or evaluate their cross-cultural validity, specifically in Latino youth [15]. The purpose of this review is to summarize new sleep health research conducted among Latino children and adolescents. We identified limitations in sleep health research and practice in Latino pediatric populations and offer recommendations to move the field forward.

CURRENT STATE OF PEDIATRIC SLEEP RESEARCH AMONG LATINOS

In the past year, 10 published studies, 4 quantitative and 6 qualitative, have focused on sleep in U.S. Latino (parent- or caregiver-identified) children. Of the 4 quantitative studies, 2 were cross-sectional and 2 were prospective interventions. The 4 studies relied on parent- or caregiver-reported sleep duration, suggesting that sleep health may not have been the primary focus of these studies. The 6 qualitative studies provide valuable insights into environmental and cultural factors that may influence sleep health, which fill some of the gaps that the quantitative studies did not address.

Of the two studies reporting on cross-sectional findings in U.S. Latino children, a study by Schmied *et al.* [16] examined the association between social ecological factors and adherence to age-appropriate sleep duration recommendations, using a cross-sectional study of U.S. Latino children living along the California-Mexican border (n = 1,165). The study found that 48% (2 years) to 63% (3–5 years and 6–12 years) of children met the recommended amount of sleep for their age [16]. Furthermore, findings showed that among school-aged children (6–12 years), living out of poverty and regular bedtimes were related to meeting sleep recommendations, highlighting what is already known [17-19]. Another multinational cross-sectional study surveyed caregivers of 1- to 5-year-old Latino toddlers in Chile, Mexico and the U.S., and examined sleep (duration and quality), physical activity and screen time during initial phase of the COVID-19 pandemic (U.S.: May to August 2020) [20]. Focusing on findings among U.S. Latino toddlers, Jauregui *et al.* found that sleep duration and sleep quality remained the same when comparing before and during the pandemic, which is discordant with other study findings among low-income Latino children from the San Francisco Bay Area [21]. Jauregui *et al.* also found that apartment or condominium living was a risk factor for shorter sleep duration and having an electric device in the room was a risk factor for a decrease in sleep quality, which is also consistent with an earlier study conducted among low-income Latino children from the Boston Area [22]. While these studies confirmed noncompliance with sleep recommendations, limitations are that both Schmied *et al.* [16] and Jauregui *et al.* [20] used parent-reported sleep duration, rather than more objective assessment. These studies could be over-reporting nighttime sleep duration [23] given that parent report does not account for time to fall asleep (sleep onset latency) or night awakenings, which would result in even shorter sleep. Furthermore, the studies were limited regarding a deeper understanding of mechanisms by which sleep context impacts children's sleep, especially among Latino children.

Of the two studies reporting on intervention effects in U.S. Latino children, one study was a 3-arm intervention in 3-year-old children attending Head Start (n = 325; 87% Latino sample) in San Antonio, Texas [24■■]. Children were randomly assigned to one of three groups: center-based intervention group, center-based plus home-based intervention group, or control. The center-based component focused on exposure to fruits and vegetables, water consumption, and reducing screen time. Similarly, the home-based component included a monthly newsletter focusing on physical activity, nutrition, screen time, as well as sleep time recommendations at home and parent were invited to eight monthly education sessions. Using 7-day parent- or caregiver-reported sleep logs (including naps), findings showed a 15-min increase in weekday sleep duration in both intervention groups compared to the control group; however, there were no significant changes in weekend sleep duration. Despite a positive increase in weekday sleep associated with the intervention arms, total sleep duration (weekends and weekdays) in all intervention and control groups remained below the minimum 12-h sleep recommendation for this age. The primary focus of another intervention study was to deliver health education to low-income parents of Latino infants during wellness visits in the first 12 months of life [25■]. Mother-infant pairs (n = 96) were recruited from an academically affiliated federally qualified health center in an urban setting (San Francisco, CA) and randomized to sessions of health education (intervention) or financial coaching (attention control). The intervention arm included valuable information for all parents regardless of race and ethnicity, including infant nutrition and feeding, screen time, and sleep and bedtime routines. The authors highlighted the importance of providing information in Spanish given that 89% and 77% of the intervention and control group, respectively, reported Spanish as their preferred language, which could have contributed to positive intervention results. Using parent-reported nighttime sleep duration, findings showed that sleep duration was higher in the intervention group at 12 months. While results are encouraging, the study was not without limitations. First, the study was limited to nighttime sleep only and faced the challenge of handling incomplete data (25–28%) for the follow-up assessments, which may relate to contextual factors of working with low-income families [25■]. Furthermore, of 342 eligible families, 65% declined to participate [25■]. Both challenges highlight the importance of working with communities to better understand how to engage Latino parents in research that seeks to reduce sleep health disparities.

A total of 6 studies reported on qualitative findings among U.S. Latino children, which contributes to the context of research regarding Latino families greater likelihood than White families to live in high crime neighborhoods with increased ambient noise due to socioeconomic circumstances [27]. Recent qualitative research provides additional context regarding sleep hygiene and home environment among Latino children. Gray, Vazquez and Agnihotri highlighted some of these factors [29■■] in a qualitative study among Latino mothers and their 6- to 18-month-old children. Authors found that while mothers desired to have their child sleep in a separate bed or room, they lacked the resources to do so. Authors emphasized that well intended clinical advice, like ‘best practices’ on co-sleeping, bed-sharing with older siblings [30■] and sleep hygiene should consider family constraints regarding space and schedules. Authors further suggested that asking questions about family schedules (e.g., shift work, multiple jobs, irregular work hours), room- and bed-sharing,

and the availability of other sleep spaces might be important considerations for health professionals serving immigrant communities [30■].

Other considerations that are equally valid for both infants and older children were highlighted by Maier *et al.* who conducted interviews with Latino and Black adolescents between 14 and 17 years [31]. Participants described potential barriers to *good sleep* related to the immediate physical surroundings (e.g., noise and light). These two issues were also observed in a study conducted among 7- to 9-year-old Latino, Black and non-Latino White children. Specifically, Yeo and colleagues found that for Latino children only, noise exposure during nighttime sleep was related to more frequent daytime naps, shorter nighttime sleep duration, and more frequent awakenings [32]. Findings of the Nguyen-Rodriguez *et al.* study also suggested that noise-related high-density living and safety (domestic disputes among neighbors) affected the sleep quality of Latino families with preadolescents [30■].

RECOMMENDATIONS

We offer the following recommendations to advance sleep research for the U.S. Latino pediatric population. First, it is important to assess the full 24-h period using objective assessments to gain a better understanding of total sleep duration and other sleep characteristics in the Latino pediatric population and to address potential biases from parental recall. Objective assessments for community research, such as actigraphy or accelerometry, can be used to estimate sleep duration and other sleep characteristics such as sleep quality, onset latency, and disturbances. Currently, limited findings regarding 24-h sleep make it difficult to understand whether children in their respective age groups meet sleep recommendations. For example, accounting for the full 24-h cycle could clarify whether interventions should focus on nighttime or daytime sleep for ages 0 to 5. Objective assessment of the 24-h period is also crucial for understanding how to shift time spent in sedentary behaviors to time spent sleeping. For example, in a cohort study examining sleep and activity patterns in the same 24-h period across 3 consecutive days in Latinos aged 8 to 10, it was estimated that for every 1-h increase in sleep duration, children engaged in less subsequent sedentary time by 40 min [38]. Disrupting sedentary time is key to improving sleep duration as well as regular bedtimes that allow adequate time to obtain sufficient sleep. Therefore, incorporating objective assessment of the 24-h period could inform more effective intervention practices focusing on sleep health among Latino children.

Second, more comprehensive research and interventions are necessary. On the one hand, research needs to go beyond the description of health disparities in sleep outcomes. Future work should evaluate the complexities of many Latino families to, for example, enforce regular bedtimes. Latino families are unfairly subjected to negative effects of systematic racism that impact social determinants of health (cite MOP360103). Latinos are primarily employed in the construction and service industries [33] and earn the lowest wages in the county, which make it difficult to accord the cost of living [34]. This low household income is related to increased variability in children's weekday sleep [35]. These economic realities pose challenges in including families in research and intervention studies. For example, tailoring intervention intensity should be considered to avoid participant refusal, as learned

from the study by Beck *et al.* [25■]. Moreover, because of economic necessity, Latinos often reside in multigenerational households, with extended family who may be more established, or with nonfamily members [36,37], which could determine sleeping arrangements (e.g., bedroom vs. living room). High-density households may be challenging to address. On the other hand, diet and physical activity have been the primary focus on interventions, yet these behaviors and circadian sleep do not occur in a vacuum. Figure 1 from Martinez *et al.* [38] provides a helpful conceptual model of these multiple behaviors. In addition, the role these factors play in child and adolescent development are unclear. In a longitudinal study of Latino children, sleep consistently played a protective role against child obesity, and more complex roles of physical activity and energy intake in terms of maintaining a healthy weight [38]. These findings regarding sleep, physical activity and diet align with the new iteration of the American Heart Association's Life Essential 8, which emphasizes the importance of energy balance.

Third, and toward more comprehensive research, a better understanding of the sleep environment is necessary to inform future intervention targeting improved sleep health among Latino children. While we know that home and neighborhood sleep disturbances exist, we not only need to better understand these challenges but also advocate to improve these environments for children and their families. Cultural practices, such as co-sleeping, require culturally appropriate techniques sensitive to beliefs and practices. Clinical advice regarding co-sleeping and sleep hygiene should incorporate information on family schedules (e.g., shift work, multiple jobs, irregular work hours), room- and bed-sharing, and the availability of multiple sleep spaces. As infants age, survey questions might shift from co-sleeping to bed-sharing with older siblings, as suggested by Nguyen-Rodriguez [30■]. Both Nguyen-Rodriguez *et al.* and Yeo *et al.* also raised the issue of temperature, both high and low, and its relationship with sleep quality [30■,32]. Yeo *et al.* suggested low-cost mitigations strategies, such as the use of a fan, could address high temperatures and work as white noise from outside disturbances [32]. Neighborhood noise may be more difficult to modify, particularly in urban areas, which may leave Latino and other at-risk populations at a disadvantage to meet sleep recommendations. Empowering Latino families to advocate for local ordinances is an area worth exploring.

Lastly, as in all research, to have a meaningful impact, community-based approaches are essential for systems level changes that involve schools, families, and the child. Leveraging preexisting infrastructure may help avoid loss to follow-up, as shown by Beck *et al.* [25■].

The study conducted in Head Start by Ulleving *et al.* [24■■] also illustrated a promising approach, yet potentially insufficient when contextual factors in the home are not addressed. For example, studies have shown that home and neighborhood environments may also impact sleep in preschool school- and school-age children [26-28]. Nevertheless, integrating multilevel systems changes, including policy and education, to reinforce healthful behaviors among Latino children and their families are encouraged. While interventions in the first years of life are important, improving sleep health in all Latino pediatric populations is necessary to advance sleep health equity.

CONCLUSION

Understanding Latino children's sleep hygiene and bedtime behaviors is essential for developing effective public health interventions to promote healthy sleep habits, and address sleep health disparities. Several individual and family-based factors play a role in children obtaining sufficient sleep, including poverty, household size and density, physical surroundings, noise, screen time, and having regular bedtimes. An area that is less studied is pediatric sleep in the 24-h cycle for infants and toddlers, especially using objective assessment [39]. Moreover, certain factors may hold particular relevance for the Latino community, including multigenerational households and interventions that consider cultural, including language, and community dynamics. Clinicians in particular should consider how preventive guidance can be adjusted to consider different cultural and economic realities that influence the potential for meeting sleep guidelines and ensuring best sleep practices for Latino children.

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■ of special interest

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KEY POINTS

- Sleep health, a multidimensional construct that encompasses domains such as patterns and related behaviors (e.g., bedtime schedule), is important for cardiovascular health as noted by the American Heart Association's Life's Essential 8.
- Existing sleep disparities among U.S. Latino children are well documented.
- Research capturing 24-h circadian sleep and behaviors as well as contextual sleep factors is limited, yet essential for advancing sleep research and interventions addressing sufficient sleep among Latino children.
- Clinical guidelines should adapt to accommodate the realities of Latino families such as co-sleeping, bedsharing and multigenerational households, as well as environmental factors like noise and temperature.

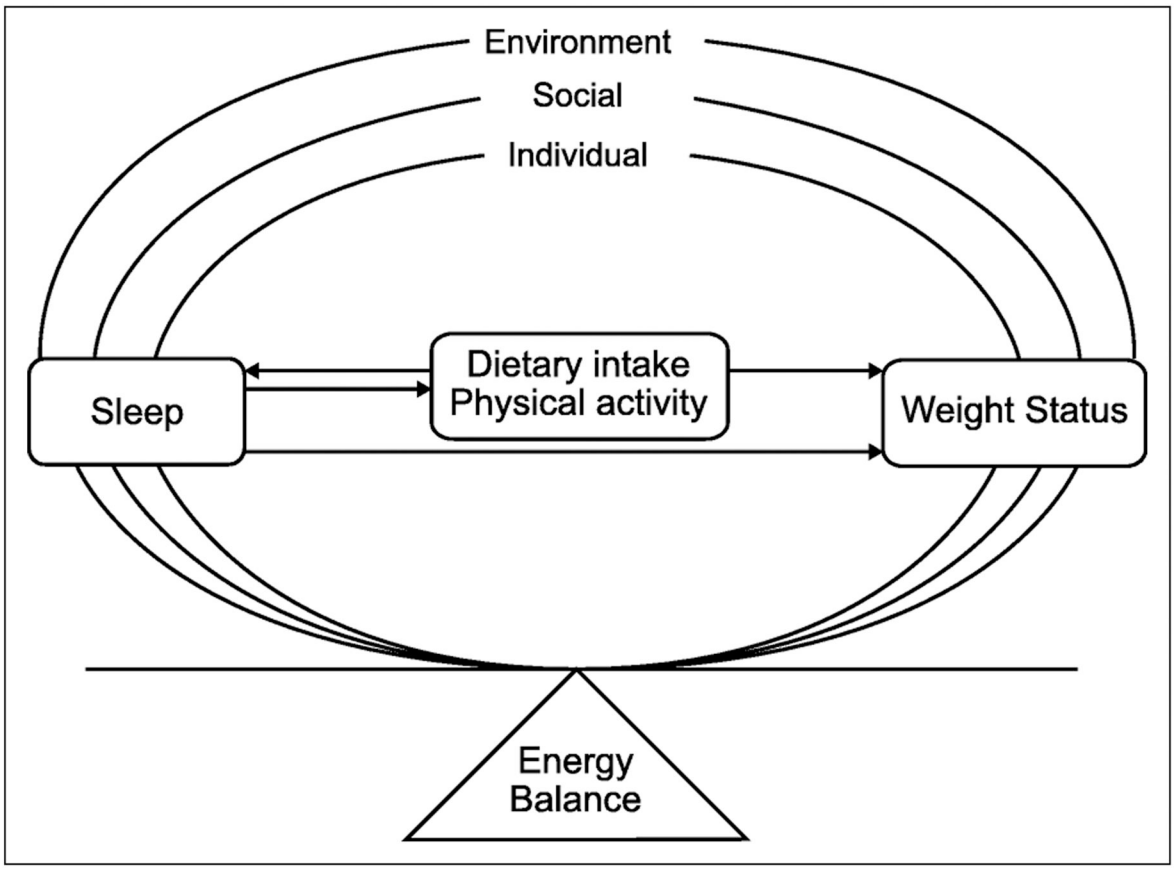

FIGURE 1.
Conceptual model of understanding interplay between sleep, dietary intake, physical activity. [38].