The impact of inconsistent sleep schedules on toddler BMI

February 22 2021, by Kelly Bothum

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Establishing a consistent sleep schedule for a toddler can be one of the most challenging aspects of child rearing, but it also may be one of the most important.

Research findings from a team including Lauren Covington, an assistant professor in the University of Delaware School of Nursing, suggest that children with inconsistent sleep schedules have higher body mass index (BMI) percentiles. Their findings, published in the *Annals of Behavioral Medicine*, suggest sleep could help explain the association between household poverty and BMI.

"We've known for a while that physical activity and diet quality are very strong predictors of weight and BMI," said Covington, the lead author of the article. "I think it's really highlighting that sleep may be playing a bigger role here than it's been given credit for."

The study used data from an obesity prevention trial for mothers and their children living in Baltimore. All of the families were eligible for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and 70% were living at or below the poverty line. As part of the trial, 207 toddlers wore accelerometers that measured their sleep and physical activity for up to a week at a time. Mothers also completed a food diary that was compared with the Healthy Eating Index, a measure of diet quality based on the recommendations from the Dietary Guidelines for Americans.

Researchers wanted to examine the relationship between poverty and BMI, specifically looking at whether the consistency of when toddlers went to bed, their level of physical activity and diet quality could explain the association. They found that children from households with greater poverty had more overall inconsistent sleep onset times. And those with more inconsistent bedtimes had higher BMI percentages.

Covington said it is likely a bidirectional relationship. "There's a lot of teasing out the relationships of the mechanisms that are at play here, which is really difficult to do because I think they're all influencing each other," she said.

Sleep recommendations suggest children go to bed within an hour of their usual bedtime on a nightly basis. But for families living in poverty, such scheduling may not be so easily done, Covington said, especially if a caregiver is the only parent, juggling multiple jobs, parenting multiple children or dealing with a tenuous housing situation.

"There's so many factors that are at play and not necessarily controllable, especially in disadvantaged communities," said Covington, who hopes in the future to develop interventions for families that support healthy routines.

Covington, who joined the UD faculty in 2018, became interested in sleep research while working as a pediatric intensive care nurse. She encountered several families who lost a baby to sudden infant death syndrome (SIDS) as a result of their sleep environment.

"There's so much stigma and stereotypes out there and people are just so quick to judge," she said. "These families just want to do what's right for their child. They just either don't personally know how to or they don't have the resources to do it."

Covington is currently working on a study comparing the sleep similarities between children and their caregivers. She and other researchers, including Associate Professor Freda Patterson from the Department of Behavioral Health and Nutrition, School of Nursing professor Emily Hauenstein and UD graduate students Angeni Cordova and Shannon Mayberry, also completed a systematic review of the existing research literature looking at the influence of the family context in early childhood health sleep health.

Their findings, published in the peer-reviewed journal *Sleep Health*, found that the presence of household chaos and poor-quality marital relationships were directly associated with early childhood sleep

problems and variable sleep timing.

For families who have been struggling during the coronavirus (COVID-19) pandemic, creating a regular evening routine may be a doable way to make a difference in a child's health, despite the other upheaval going on at this time.

"Implementing a consistent bedtime could be one behavioral change that a family could potentially do," said Covington, who came to UD because of the opportunity to work with other sleep and disparity researchers. "It's more attainable than maybe getting healthy food at the grocery store or playing outside on the playground, especially now with the cold weather. Just having a consistent bedtime can help provide some sense of structure, but then maybe have better implications for health and BMI as well."

More information: Lauren Covington et al. Longitudinal Associations Among Diet Quality, Physical Activity and Sleep Onset Consistency With Body Mass Index z-Score Among Toddlers in Low-income Families, *Annals of Behavioral Medicine* (2020). DOI: 10.1093/abm/kaaa100

Provided by University of Delaware