SOCIETY *of* BEHAVIORAL MEDICINE

Better Health Through Behavior Change

EMBARGOED FOR RELEASE
8:40 a.m. Eastern Time
Saturday, April 26, 2014

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Short Sleep Duration Linked to Increased Odds of Childhood Obesity in Low-Income, Urban Households

Philadelphia, PA – A new study by researchers at Rush University Medical Center suggests that short sleep duration may increase a child's risk of obesity in low-income households. And, the link between sleep duration and children's weight status can be traced back to aspects of the home environment.

"Childhood obesity disproportionately affects low-income children," said Brad Appelhans, PhD, a clinical psychologist and obesity researcher at the Rush University Prevention Center and principal investigator of the study. "Very little research to date has examined childhood obesity factors in the home environment of low-income households, particularly with respect to emerging risk factors such as sleep duration."

The findings of the study will be presented at the 35th annual meeting and scientific sessions of the Society of Behavioral Medicine on Saturday, April 26, in Philadelphia.

Appelhans added that most studies largely focused on neighborhood-level factors such as local access to healthy and unhealthy foods, geographic density of fast food outlets and supermarkets, venues for physical activity such as parks near the home, but few studies look at the home environment.

This study analyzed data collected on health behaviors and the home environment during home visits in low-income, urban households with either only normal weight or predominantly overweight or obese children between the ages of 6-to-13-years-old. A total of 103 households were enrolled in the study, and 48 (47 percent) of the participants were normal weight households and 55 (53 percent) were overweight/obese households.

Parents or caregivers and children reported on the child's sleep duration, television and computer screen time and diet. Researchers also collected data on foods kept in the home, media such as computers, gaming consoles and televisions in bedrooms and living spaces as well as sports equipment. Participants also had their physical activity measured and recorded with small, wearable motion sensors.

Sleep duration was the only health behavior associated with child weight status. Normal weight children slept 33.3 minutes per day longer on average compared to the overweight/obese children in the study.

Traditional childhood obesity risk factors such as media screen time, intake of high caloric beverages and fast food, snacks, fruits and vegetables, were not directly related to weight status.

“We have identified specific intervention targets in the home that can help improve sleep and potentially reduce the risk of childhood obesity in kids from low-income households,” said Appelhans.

The findings also suggest that increasing the availability of sports and recreational equipment in the home is unlikely to promote weight loss in low-income children even though these items are less abundant in low-income households than higher-income households.

During the final stage of the project, researchers developed statistical models to examine how aspects of children’s home environments may impact weight through their effects on sleep. Their data indicated that variables such as the presence of a television in the child’s bedroom, screen time, caregiver screen time monitoring, consistent implementation of a bedtime routine, and perceived chaos and disorganization in the home environment may contribute to childhood obesity through intermediate effects on sleep duration. The models accounted for child age and caregiver body mass index (BMI).

“Though dietary modification and physical activity are essential interventions for childhood obesity, our findings highlight the importance of targeting sleep in weight management interventions for low-income children by promoting a consistent bedtime routine, reducing chaos and disorganization in the home environment and encouraging caregivers to monitor screen time,” said Appelhans. “Our data also supports removing televisions from children’s bedrooms.”

Past laboratory studies show that sleep deprivation and short sleep duration may promote weight gain through alterations in appetite-regulating hormones such as ghrelin and leptin or through behavioral mechanisms including increased drive to consume tastier, high-calorie foods. “Further research is needed to better understand the association between sleep duration and childhood obesity and to develop and evaluate interventions that would be effective in low-income populations.”

The study was funded by the American Cancer Society, Illinois Division. Researchers from Rush University Medical Center, Brown University, University of Massachusetts Medical School,

Rosalind Franklin University and East Carolina University were led by Appelhans to conduct this study.

Rush (http://www.rush.edu) is a not-for-profit academic medical center comprising Rush University Medical Center, Rush University, Rush Oak Park Hospital and Rush Health.

The Society of Behavioral Medicine is a multidisciplinary organization of clinicians, educators, and scientists dedicated to promoting the study of the interactions of behavior with biology and the environment and the application of that knowledge to improve the health and well being of individuals, families, communities, and populations. www.sbm.org

This study was presented during the 2014 Annual Meeting and Scientific Session of the Society of Behavioral Medicine (SBM) from April 23-26, 2014 in Philadelphia, PA. However, it does not reflect the policies or the opinion of the SBM. This symposium presentation was held on April 26th. Given that this study was presented at a scientific meeting, the data and conclusions reached should be regarded as preliminary, until they are published in a peer-reviewed journal. Funding agencies played no role in this study. There are no conflicts of interest for the investigators.

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