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Children's Nutrition Research Center

at Baylor College of Medicine

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NUTRITION & YOUR CHILD

Healthier sleep habits could be the key to reducing your child's summer weight gain

For most children, summer signifies the season of freedom. Without the worry of waking up early for school, kids often find themselves sleeping later than usual. A new study led by the USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine shows how this later sleep time is a predictor of accelerated summer weight gain and could lead to an unhealthy weight status. The paper was published in the International Journal of Behavioral Nutrition and Physical Activity.

The study compared the behaviors of children aged 5 to 8 years during the school year and summer and consequences for body mass index (BMI). Participants wore an accelerometer to monitor their sleep patterns, amount of outdoor light they received, and how much physical activity they participated in during both timeframes. Using the data collected by the accelerometers, researchers were able to conclude that there was no significant difference in total light received and physical activity engaged in during the school year and summer.

However, the devices recorded another common outcome – later sleep times during the summer.

The later sleep times caused a shift in sleep midpoints, the midpoint between when children go to bed and when they wake up, to an average of 1.5 hours later compared to sleep midpoints during the school year. Based on data from this study, researchers were able to identify later sleep midpoints as a prime predictor of an increase in BMI during the summer, with females increasing their BMIs at faster rates than males.

"It's interesting because a lot of the hypotheses about why children increase in BMI during summer is often centered around having greater access to snacks and more screen media use and less physical activity," said Dr. Jeanette Palcic Moreno, assistant professor of pediatrics – nutrition and lead author of the study, "But people don't often think about their children's sleep patterns during the summer." Sleep patterns are impacted by numerous factors, and Moreno is currently examining how her work can guide parents trying to improve their children's sleep habits.

"We're working on a pilot study to look at the feasibility of an intervention to address children's sleep patterns during summer for the prevention of accelerated summer weight gain," said Moreno, "We're looking at the impacts of things such as light exposure, promoting a healthy circadian rhythm and activity patterns, and how they can contribute to healthier summer sleeping habits."

Currently, Moreno suggests the best way to combat BMI increase during the summer is for parents to ensure that their children have similar routines to those during the school year.

"Maintaining a similar bedtime during both the school year and the summer is really important," said Moreno, "I also suggest dimming the lights around bedtime and keeping the last meal of the day one or two hours before bedtime."

MULTISITE PAIN AMONG CHILDREN WITH CHRONIC ABDOMINAL PAIN DISORDERS

While children who suffer from chronic abdominal pain disorders typically experience pain in the stomach, they may also complain about pain in other areas. A group of researchers at the Children's Nutrition Research Center in the Department of Pediatrics at Baylor College of Medicine and Texas Children's Hospital wanted to find out how common pain in places outside the stomach is among this patient population, as well as how it affects their daily activities. Their findings were published in the *Journal of Pediatrics*.

Chronic abdominal pain disorders, also known as functional abdominal pain disorders, include irritable bowel syndrome (IBS). IBS affects nearly 20 percent of children worldwide. While IBS can run in the family, it is not only attributable to genetics. Early life stressors, being born premature or other illnesses (such as viral infections of the gut or intestines) can increase the risk of developing it

This study examined children between the ages of 7 and 17 who experience chronic abdominal pain like IBS. The children completed questionnaires, and researchers found that in these children, more than 70% experienced pain in more than one part of the body. The most common non-stomach pain was headaches, followed by pains in the muscles, joints, and bones. Children with chronic abdominal pain who also reported pain in other body parts were more likely to have more severe stomach pain, issues that affected their daily living (such as difficulty going to school or doing activities), had lower health-related quality of life and had a higher tendency to feel anxious or depressed.

"The implications for us as pediatric gastroenterologists and pediatricians caring for children with chronic abdominal pain is to ask about pain in other areas," said Dr. Bruno Chumpitazi, associate professor of pediatric gastroenterology at Baylor College of Medicine and lead author of the study. "For those with multisite pain, we must take an all-hands-on deck approach to support their psychosocial and functional well-being through referrals to see psychologists and, if needed, other specialists that may be able to address the other pains, such as neurologists for headaches. Our goal is to work as a team to help these children with multisite pain, improve their quality of life and diminish the impact of functional disability."

The next step, according to Chumpitazi, is to do a prospective study to identify children early on with chronic abdominal pain and determine over time if they develop pain in other areas of the body.

"We're trying to understand the biological, psychosocial and environmental influences that lead to multisite pain developing in these children. We can then try to modify these influences early in the course of identifying a child with chronic abdominal pain so we can prevent multisite pain onset and the disability associated with it," Chumpitazi said.

By Homa Shalchi

Overactive brain circuit causes anorexia in animal model

Anorexia or lack of appetite is an eating disorder. People affected are highly concerned about gaining weight and usually both severely restrict the amount of food they eat and exercise excessively, leading to severe weight loss. In its most prominent form, the condition is called anorexia nervosa, an entity that has the highest mortality rate among all psychiatric diseases.

"Anorexia has no approved treatment, and the underlying causes is unclear," said Dr. Yong Xu, professor of pediatrics – nutrition and molecular and cellular biology at Baylor. "In this study we worked with an animal model of the condition that mimics many of the characteristics observed in people to investigate whether there were alterations in the brain that could be involved in the condition."

Dopamine and serotonin neurons in the brain communicate to regulate feeding

Xu and other researchers already were aware that two types of brain cells called dopamine and serotonin neurons (because they secrete these neurological signaling chemicals) are not only involved in regulating feeding but also may malfunction in people with anorexia. However, the precise nature of the malfunction was not clear. In this study, Xu and his colleagues investigated how these cells contributed to anorexia in an animal model.

"First, we found that under normal conditions dopamine neurons do communicate with serotonin neurons, and we studied this connection or brain circuit to determine how it regulates feeding," Xu said.

The researchers found that the strength of the signal the neurons used to communicate with each other would determine how much the animals would eat.

"When the strength of the signal between dopamine and serotonin neurons was low, the animals would overeat," Xu explained. "On the other hand, when the signal between the two types of neurons was strong, the animals lost their appetite."

The researchers then looked closer into the communication between dopamine and serotonin neurons in the mouse model of anorexia. They discovered that this brain circuit is super activated in the animal model, providing an explanation for the animals' lack of appetite.

Key to regulating the dopamine-serotonin circuit is a protein called DRD1. Xu and his colleagues discovered that eliminating the gene that makes DRD1 partially restored normal eating and exercise behaviors in the animal model.

"The findings suggested that using specific drugs to control DRD1 activity also could help reduce the circuit's hyperactivity, an approach that could have clinical applications," Xu said. "Indeed, we found that a drug that interferes with DRD1 activity can effectively prevent anorexia and weight loss in the animal model. These findings support further studies toward developing a similar therapeutic approach for humans with anorexia."

Anorexia is more common in women than in men, but the reason for this difference is not clear.

"We plan to conduct further studies to try to understand the reasons for this difference," Xu said.

Read the complete report in the journal *Nature Neuroscience.*

Family-focused obesity prevention program targets Hispanic parents and children

While many parents aim for children to eat all the food on their plate, researchers at the USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine uncovered ways for children to understand and communicate their internal cues of hunger and fullness. Their findings were published in the *Journal of Nutrition Education and Behavior*.

Researchers received funding from the USDA to develop an obesity prevention program for Hispanic preschoolers attending Head Start, an educational program for children from income-eligible families that provides children and their parents skills to prepare for school. The study consisted of 255 families randomly assigned into prevention or control groups.

"The overall goals of the project were to help parents and children be more aware of children's cues for hunger and fullness through selfregulation and to get children to try novel foods, especially fruits and vegetables," said Dr. Sheryl Hughes, professor of pediatrics – nutrition at Baylor and lead author of the study.

Researchers developed a seven-session curriculum for parents and children from low-income backgrounds. A trained facilitator led the parent sessions, while the children's sessions was led by two early childhood education facilitators. After their sessions, the families met to eat a healthy meal while bonding with others in the program and discussing what they learned. Following an introduction session, the subsequent parent sessions focused on topics including trying new foods, internal cues of hunger and fullness for children, portion sizes, structure of the outside environment, and structure of the home environment. The final session was a review of all the topics.

The study included pretest, post-test and six- and 12-month assessments. At the final assessment, researchers found that feeding practices among parents who attended the sessions were significantly better than those of the controls. Furthermore, the children in the treatment group were less likely to be overweight or obese compared to the controls.

"Parents reported that they knew best feeding practices and were using them with their children. The outcome was that children were less likely to be obese or overweight," Hughes said.

To help children better understand eating self-regulation, researchers created three dolls with Velcro pouches indicating they were full, halfway full or not full. This hands-on approach was used throughout the seven sessions to teach children how it feels to be full, as well as the appropriate language to use with their parents indicating their fullness. This also taught parents that children can understand fullness cues.

"It's common for parents to tell their children to clean their plate and to use food as a reward or punishment. Our program attempted to change these feeding practices with the understanding that their children are aware of their own fullness cues," Hughes said.

Parental feeding practices that encourage eating self-regulation includes slowing meals down, serving meals in appropriate portion sizes, avoiding unlimited amounts of energy dense foods on the table (such as chips, fries or dessert) and the use of responsive feeding strategies.

The program increased parents' repeated presentation of new foods, taught appropriate child portion sizes, involved children in food preparation, provided knowledge of best feeding practices and reduced feeding misconceptions.

By Homa Shalchi

By Ana Rodriguez



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JOIN A CNRC NUTRITION STUDY!

Houston-area residents are invited to participate in the following nutrition research projects designed to help CNRC scientists learn more about the nutritional needs of children. Free parking is provided. For most studies, financial compensation is provided. For questions on becoming a CNRC research volunteer call Noemi Islam at 713.798.7002 or email nislam@bcm.edu



Teen Talk Study H-46202

Children between the ages of 14 and 17 years living in rural communities and their parents are invited to participate in a study to understand what affects their food consumption, physical activity choices and body weight. Compensation provided. For more information, please contact Chishinga Callender at 713.798.0506 or Noemi Islam at 713.798.7002.

Bone Health Study H-45986

Adolescents and young adults between the ages of 12 and 21 years are needed for a research study to investigate the effects of obesity and childhood onset diabetes on bone health and risk of heart disease in youth. Participants can be of normal weight or overweight, with or without type 2 diabetes. Study involves body composition, scan and blood tests. Compensation is provided. If interested, please call 713.798.6791.

Bone Growth Study H-50574

Adolescents and young adults between the ages of 12 and 17 years are invited to participate in a research study to investigate the effect of childhood onset diabetes on bone health and strength in youth. Participants can be of normal weight or overweight, with or without type 2 diabetes. Study involves body composition, bone scan and blood tests. Compensation provided. If interested, please call 713.798.6777.

Development and Validation of an Automated Measurement of Child Screen Media use: FLASH H-40556

Parents with two children between the ages of five and 17 years are needed for a screen time research study. The parents and children will visit the CNRC for a two-hour session to help test a measuring system. Must have an Android device. Participants receive a \$50 compensation. If interested, visit https://redcap.link/Screentime, call 713.798.0503 or email flashstudy@bcm.edu.

Fit24 Study H-49195

Fit24 is a 12-week program for Hispanic teens with obesity between the ages of 14 to 16 years. Participants get a Fitbit watch and daily text messages to help them set move and sleep goals. Participants will receive up to \$165 in compensation. If interested, please call 713.798.7067 or email Karina.Lopez@bcm.edu.

Crusader Study H-47575

Hispanic adolescents with obesity between the ages of 14 and 16 years are needed for a research study to understand how sitting for long periods of time affects their overall health. Volunteers will visit the CNRC one day for researchers to take blood, ask questions about their health and observe them while sitting for a long period of time. Volunteers will receive free parking, breakfast and \$140 compensation. For more information, call 713.798.7067 or email Karina.Lopez@bcm.edu.