RESEARCHERS EXAMINE OBSTACLES TO, AND MOTIVATION FOR, PHYSICAL ACTIVITY AMONG ADULTS AND CHILDREN

Obesity is a critical public health concern in the U.S.; however, the majority of children and adults do not follow the federal recommendations for physical activity. Researchers at the USDA/ARS Children’s Nutrition Research Center at Baylor College of Medicine and other USDA Human Nutrition Research Centers examined the barriers and facilitators to meeting physical activity recommendations among adults and children. The study was published in the Journal of Physical Health and Sports Medicine.

“The prevalence of obesity is approximately 19 percent among children and adolescents ages 2 to 19 years of age. The prevalence among U.S. adults is 40 percent,” said Dr. Theresa Nicklas, professor of pediatrics-nutrition at the CNRC. “Decreased physical activity and increased sedentary behavior are associated with increased weight in children and adults.”

The current recommendations for children and adolescents up to age 17 is to perform at least 60 minutes of moderate-to-vigorous physical activity every day. Statistics show that only 22 percent of 6- to 19-year-old children meet these current recommendations. This is worrisome because physically fit children are much less likely to become obese later in life. Adults ages 18 to 65 should get at least 150 minutes of moderate-intensity physical activity per week. However, most adults do not get enough physical activity weekly, and 33 percent are not active at all during their leisure time.

The study consisted of focus groups with adult caregivers and 5th grade children to determine the barriers and facilitators to meeting physical activity recommendations. Researchers developed four surveys based on the groups: barriers for adults, facilitators for adults, barriers for children and facilitators for children.

Adults lacked time, had other things to do or had no set schedule for accommodating physical activity. Those who lacked motivation reported poor self-discipline that postponed engaging in physically activities. They also explained that work, demands of home life, child activities and lack of child care prevented them from being physically active on a regular basis.

Adults perceived health benefits as a facilitator to being physically active. Other facilitators included family cohesion and peer support, and ways to be physically active. The majority of the participants reported being aware of the benefits of physical activity and these motivated them to be physically active. Among the benefits were benefits improved self-esteem, having more energy, improving health, living longer and prevention of disease and obesity. Participants stressed the importance of family participation and

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Nutrition is a crucial factor that determines the survival, growth and development of an infant. Whenever newborn infants, such as those born very prematurely, are unable to eat by themselves, they are fed by a tube passed through the mouth or nose into the stomach. Food is given through the tube either continuously or intermittently (in order to adhere to a schedule that is more like that of regular meals). In a study published in the *American Journal of Clinical Nutrition*, researchers explored the differences between intermittent and continuous feeding schedules to see which is more beneficial.

“Almost 10 percent of newborns are low-birth-weight, and appropriate nutrition is a major factor that influences their survival and development. Tube feeding is necessary in infants with impaired ability to ingest food,” said Dr. Teresa Davis, professor of pediatrics at the USDA/ARS Children’s Nutrition Research Center at Baylor College of Medicine. “The nutrition literature suggests that improving lean growth, as opposed to deposition of fat tissue, of these infants may be beneficial in reducing their lifetime risks of developing diabetes, obesity and cardiovascular disease. We wanted to see if one feeding pattern was more beneficial for promoting lean-mass growth in infants by comparing the long-term effects of continuous and intermittent bolus feeding.”

In this study, researchers used neonatal pigs, which are well-accepted models of human infants due to their similar anatomy and metabolism. The pigs received the same amount of nutrients every four hours, either continuously or intermittently. Before and at the end of a 21 day period, the pigs’ lean and fat accretion were measured, as were hormone and substrate profiles, muscle mass, body protein synthesis rates, and indexes of nutrient and insulin signaling.

The findings suggest that feeding the infant pigs intermittently induces a pulsatile pattern of amino acids and insulin, similar to normal meal feedings. This pattern activates the body’s signaling pathways that regulate better rates of body protein synthesis in the muscles of these infants, resulting in an increase in lean mass over the long-term.

These results suggest that intermittent bolus feeding should be used for infants who can tolerate this type of feeding. Since it enhances lean growth in neonatal pigs without promoting fat deposition, intermittent bolus feeding may promote lean growth in human babies who need to be fed by tube.

“Before this study, the clinical benefits of feeding frequency could not be reliably determined due to the limitations of conducting controlled studies in human infants. Our results provide direct evidence that the intermittent bolus pattern of feeding is more advantageous than continuous feeding in improving lean body mass and growth of neonates,” said Davis, who also is director of the CNRC Postdoctoral Fellowship Program and a member of the 2020 Dietary Guidelines Advisory Committee.

Other researchers who participated in this study include Samer W. El-Kadi, Claire Boutry, Agus Suryawan, Maria C. Gazzaneo, Renán A. Orellana, Neeraj Srivastava, Hanh V. Nguyen, Scot R. Kimball, and Marta L. Fiorotto. The researchers are affiliated with one or more of the following institutions: USDA/Agricultural Research Service, Children’s Nutrition Research Center, Department of Pediatrics, Baylor College of Medicine; Department of Animal and Poultry Sciences, Virginia Tech; and Department of Cellular and Molecular Physiology, Penn State College of Medicine.
The World Food Program, operated by the United Nations, provides school meals to about 20 million children annually. School meal programs have been shown to improve children’s vitamin and mineral status, school attendance and calorie intake, but their effects on children’s growth and thinking abilities, or cognition, are less certain. To study this, researchers at the USDA/ARS Children’s Nutrition Research Center at Baylor College of Medicine tested whether adding milk powder to a school meal affected children’s cognition and school performance.

“School meal programs are a common humanitarian activity by governments, bilateral aid agencies and charities in poor schools in sub-Saharan Africa. In practice, the foods used are often surplus commodity grains with no special nutritional value. The purpose of the school food is to promote attendance and not enhance school performance,” said Dr. Mark Manary, adjunct associate professor at the CNRC and principal investigator on the study. “This study was done to see if a small amount of milk powder added to a rice or corn cereal porridge would result in better cognition among the school children, and therefore contribute to their school performance.”

The study included 1,400 children aged 6 to 9 years living in the Atebubu district in the Brong Ahafo region of Ghana. Each child received either 9 grams of milk protein (equal to a glass of milk), 4 grams of milk protein, 4 grams of milk protein plus 4 grams of rice protein, or a sugar placebo added to their porridge each day for 9 months. The children and researchers did not know which porridge the child got until the study ended.

The children’s cognitive abilities were tested three times – when they enrolled in the study, after four months and again after nine months. Cognition was tested using a well-established method called the Cambridge Neuropsychological Test Automated Battery, which measured visual memory pattern, recognition memory, comprehension, rule acquisition and a measure of attention called set shifting.

Results showed that adding powdered milk to porridge improved lean muscle growth, and those children who received the amount equivalent to a glass of milk also had a better ability to solve problems. These results are important because they provide information on what kinds of food can be offered at school that will help children both perform better in school and grow.

“The main message of this study is that small, affordable amounts of nutrient-rich supplements, such as milk powder, can be added to school food to significantly improve the nutritional quality of school meals,” Manary said.

Other researchers who participated in the study include Reginald Lee, Lauren Singh, Danielle van Liefde, Meghan Callaghan-Gillespie, Matilda Steiner-Asiedu, Kwesi Saalia, Carly Edwards, Anja Serena, Tamara Hershey. The researchers are affiliated with one or more of the following institutions: Washington University, University of Ghana, Project Peanut Butter, Arla Foods, University of Malawi, and Baylor College of Medicine.

Arla Foods funded the study but played no role in the design, execution, analyses or presentation of the data.
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 about our studies, call NoemiIslam at 713-798-7002 or email nislam@bcm.edu, unless otherwise noted.

**Adult Volunteers Needed H-34291**
Volunteers are needed for a study to investigate whether patients with type 2 diabetes make an important compound called arginine in different amounts. Eligible participants must be African-American or Hispanic men between the ages of 20 to 60 years, diagnosed with type 2 diabetes within the last 5 years, overweight and with no other chronic medical conditions. For more information, contact Adriana Cardenas at 713-798-7003 or adriana.cardenas@bcm.edu.

**Teen Heart Health H-30665**
12- to 21-year-old adolescents and young adults, normal weight and overweight, with and without type 2 diabetes are needed for a research study investigating risk of heart disease in youth. Study involves body composition, scan and blood tests.

**Healthy Pediatric Volunteers Needed H-43759**
Healthy boys and girls between ages 10 to 18 years are needed for a study that compares the microbiome of children with primary sclerosing cholangitis (PSC) and ulcerative colitis (UC) to that of healthy children. Those interested must be declared healthy by their pediatrician, speak English fluently, and not be taking any medications, including antibiotics or hormonal birth control, for at least 6 months prior to participation. Eligible volunteers will collect stool and saliva samples at home five times during one year and send completed samples using a pre-paid mailing package.

They also will answer brief online and printed surveys coupled with each saliva and stool collection. If interested, please contact Alison Shaw via email Alison.Shaw@bcm.edu or call 832-824-0977.

**Baylor Infant Biomarker of Nutrition Study H-43692**
Researchers are seeking healthy infants 4 months and younger and their adult caregivers for a study to learn if a quick skin-reading test can reveal information about infant nutrition. The study involves three visits for infant skin readings and body measurements and to provide infant food records and optional blood and breast milk samples. To learn more about the Baylor Infant Biomarker of Nutrition Study (BIBS), please call Jocelyn Chang at 713-798-0517 or e-mail BIBStudy@bcm.edu.

**A Pediatric Gastroparesis Registry H-41641**
Researchers at Baylor College of Medicine and Texas Children's Hospital are conducting a research study to learn how slow stomach emptying (called gastroparesis) affects children and how they might treat it. Children ages 5-17 years who have been diagnosed with gastroparesis or have a combination of pain, nausea, vomiting, early satiety or postprandial fullness may be eligible. The study requires visits to the CNRC. For more information, follow [this link](#) to complete a short Contact Information survey or contact the study coordinator, Heather Charron, at 713.798.0381 or charron@bcm.edu.