



CHILDCARE FACILITIES SHOULD DO MORE TO PROMOTE PHYSICAL ACTIVITY FOR THE YOUNG

Being active plays an important role in staying healthy and in shape for children of all ethnicities. While scientists have long been able to measure how active children are, the difficulty has been to understand the context in which they are more or less active.

“We know that Latino children are at a higher risk for becoming overweight and developing obesity than others, and one important way to prevent obesity is to promote physical activity,” said Dr. Teresia O’Connor, assistant professor of pediatrics at Baylor College of Medicine. “We didn’t know much about how active young Latino children were and where they are active. We felt that if we can identify locations where children are more active, we could promote spending more time in those locations. In addition, if we can recognize locations where they are less active, we could target efforts in those places to promote more active play and physical activity for children.”

To remedy this, O’Connor and her research team at the USDA/ARS Children’s Nutrition Research Center at Baylor College of Medicine asked parents of Latino children between the ages of three and five to have their children wear accelerometers and GPS monitors for one week. The accelerometers measured how active the children were, and the GPS monitors tracked their locations.

The researchers discovered that Latino preschool children in Houston were more active when outdoors compared to indoors, which may lower their risk of developing medical conditions associated with obesity. The children were the most active when they were in a park or playground, but only 18 percent of the studied children spent time in a park or playground. “Of all the locations where the children spent time, they were the least active when in childcare or preschool settings,” she said.

O’Connor cautions that the study, which was published in the *International Journal of Behavioral Nutrition and Physical Activity*, involved a small sample of Latino preschool children in the Houston area and therefore may not be representative of all Latino preschoolers. Children who participated in the study were enrolled in diverse types of childcare facilities that included both privately owned centers

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STUDY SHOWS TELEVISION REDUCTION PROGRAM FOR LATINO PRESCHOOLERS IS EFFECTIVE

A recent study by researchers at the USDA/ARS Children’s Nutrition Research Center at Baylor College of Medicine that focused on teaching Latino preschoolers about limiting their screen time resulted in decreased screen time by at least 25 minutes per day. Their report appeared in the *American Journal of Preventive Medicine*.

“Latino children are disproportionately affected by obesity and excessive television time,” said Dr. Jason Mendoza, previously with Baylor and the CNRC and now at the University of Washington School of Medicine and Seattle Children’s Research Institute. “Studies have shown that longer television time is associated with obesity and attention issues.”

Mendoza and colleagues recruited preschoolers in Houston’s Head Start program, and their research staff taught the intervention group lessons focused on reducing screen time as well as other activities including reading, arts and crafts and even setting the table for family dinners.

Demographic, height and weight information was recorded before and after the intervention program and children wore accelerometers to track their active versus sedentary time. Parents were given screen-time diaries to record information about the amount of television watching by their children on

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RESEARCH FOCUSES ON INCREASING NUTRITIONAL QUALITY OF PLANTS

Plant scientists have been avidly working to discover new strategies to increase the nutritional quality and production of plant foods, and one strategy that has the potential to help achieve both these goals is through enhancing the plants' natural ability to degrade the simple organic acid called oxalic acid.

The oxalic acid that is naturally present in plant foods can adversely affect human health in a couple of ways. First, the oxalic acid present in the plants that people eat often binds to calcium and renders the calcium unavailable for absorption by humans and other animals. It is therefore sometimes called an antinutrient, because it interferes with the body's ability to absorb this important nutrient. Oxalic acid also can be directly absorbed from food, which can be a problem for those prone to kidney stone formation with over 75 percent of all kidney stones containing oxalic acid as a primary component.

Dr. Paul Nakata, assistant professor of pediatrics at the USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine and USDA/ARS research molecular biologist, explains that increasing the ability of edible plants to degrade oxalic acid not only has the potential to increase the available calcium as well as remove a potential toxin, but such a change also is expected to boost the plant's immunity against certain fungi that require oxalate as part of their infection process. This fungi is responsible for major crop losses each year, thus being able to decrease the amount of oxalic acid in plant food would appear to have a variety of benefits.

Earlier work by Nakata and his research colleagues using a plant called Arabidopsis suggested that an acyl activating enzyme (AAE) was required by the Arabidopsis plant to break down oxalic acid. Arabidopsis is a common

plant used for genetic work, but it was not known whether this enzyme was important to other plants as well. The research team set out to investigate whether the AAE enzyme was important in the breakdown of oxalic acid in important forage crops such as *Medicago truncatula*, which is fed to grazing livestock. Their work was published in *PLOS ONE*.

"In this study we provide evidence suggesting that other plants use the same pathway we discovered in Arabidopsis to naturally degrade oxalic acid," Nakata said. "For example, when we reduced the amount of AAE in the plant we not only see an increase in the amount of oxalic acid within the plant, but also an increase in the amount of the acid bound to calcium. We also found that the plants with reduced AAE had a lower immunity to the fungi that use oxalate as a part of the infection process."

Future research will focus on a more in-depth study of AAE and the remaining steps of the proposed pathway of oxalate degradation.

"Once we have a better understanding of how this pathway functions, we can pursue increasing the plants ability to degrade oxalic acid," Nakata said. "We anticipate that such a modification will increase the plants nutritional value in terms of calcium availability and reduce the amount of oxalic acid available for absorption thus lessening the contribution to kidney stone formation. We also would predict that such a modification would boost the plants immunity to infection by certain fungi."

Others who were essential to this research were Justin Foster and Bin Luo, both with Baylor College of Medicine.

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TELEVISION REDUCTION PROGRAM FOR LATINO PRESCHOOLERS

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a day-to-day basis. The control group had the regular Head Start curriculum that did not specifically cover television viewing.

The children in the intervention program decreased their screen time by 25 minutes per day and decreased their sedentary time by about 9.5 minutes per day.



"The preschoolers were very receptive to learning about screen time and to applying these lessons at home," said

Mendoza. "These lessons carry over into their homes and communities, which is important."

Mendoza said the next step in this research is to focus on a larger group of children over a longer period of time to have a greater impact on this at-risk community.

Others who took part in the study include Dr. Tom Baranowski, Sandra Jaramillo, Dr. Debbe Thompson and Dr. Theresa A. Nicklas with Baylor and the CNRC and Megan D. Fesinmeyer and Wren Haaland with Seattle Children's Research Institute.

Funding for this study came from the National Cancer Institute of the National Institutes of Health (K07CA131178) and the U.S. Department of Agriculture Cooperative Agreement number 6250-51000-053.

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and public schools. “It is very likely that some centers and schools are better than others in promoting active play and outdoor time for their children,” said O’Conner. “However, the data we collected suggests that as a whole, preschools and childcare settings are an important setting we should work with to try to change policy and practice to promote more active play for children.”

O’Connor also encourages families in the Houston area to make better use of parks and playgrounds to promote more activity by their Latino preschoolers. She says that as a city, we need to make sure parks are safe for children and families since parks play an important part in keeping children active and fit.

Others who contributed to this study include Ester Cerin, Australian Catholic University and University of Hong Kong; Anthony Barnett, Australian Catholic University; Rebecca Lee, Arizona State University; Jason Mendoza, University of Washington and Seattle Children’s Research Institute; and Tom Baranowski, Nancy Butte, Sheryl Hughes, and Debbe Thompson, all of the CNRC.

This study was supported by the Eunice Kennedy Shriver NICHD (R21HD060925).



RESEARCHERS FIND IMPROVED OUTCOMES IN PREMATURE INFANTS WHO ARE FED AN EXCLUSIVE HUMAN MILK BASED DIET

A study by researchers at Baylor College of Medicine and Texas Children’s Hospital found that premature infants weighing less than 1,250 grams (2 lbs 12 oz) at birth showed improved overall outcomes after being fed a human milk-based diet. The report recently appeared in the journal *Breastfeeding Medicine*.

The research compared outcomes of premature infants in four large centers in the United States before and after being fed an exclusive human milk-based diet in the neonatal intensive care unit (NICU).

An exclusive human milk-based diet consists of the mother’s own milk supplemented with donor human milk and fortifier derived from donor human milk. Babies do not receive any cow-based protein as formula or fortifiers. Prior to the implementation of this all human milk feeding protocol, infants were fed mother’s own milk with bovine fortifier or formula.

“There are published reports about the benefits of an exclusive human milk-based diet for infants with necrotizing enterocolitis, which is a devastating intestinal disease that can cause infants to lose a portion of their intestines, and become very ill or even die,” said Dr. Amy Hair, assistant professor of pediatrics at Baylor, neonatologist and director of the neonatal nutrition program at Texas Children’s, and first author of the study.

“Since implementing an all human milk-based diet at Texas Children’s Hospital for babies born weighing less than 1,250 grams, necrotizing enterocolitis has decreased from the national average of 10 to 12 percent down to 2 to

3 percent,” Hair said. Researchers studied data from more than 1,500 infants weighing less than 1,250 grams at birth from four centers and compared data from approximately two years before and two years after implementation of the exclusive human milk-based diet feeding program. They found that those infants who were fed the exclusive human milk-based diet had a lower incidence of mortality, late-onset sepsis, retinopathy of prematurity (which can lead to blindness) and bronchopulmonary dysplasia, a form of chronic lung disease in infants.

“We know that human milk has immune factors, antibodies, high levels of important fats and vitamins, so it makes sense that it would work with different processes in the body to make the baby healthier overall,” said Hair.

Others who took part in the study include Allison M. Peluso, Keli M. Hawthorne and Steven A. Abrams, formerly with Baylor and now with Dell Medical School at The University of Texas at Austin; Jose Perez and Denise P. Smith of Winnie Palmer Hospital for Women and Babies in Orlando, FL.; Janine Y. Khan of Northwestern Memorial Hospital in Chicago, Ill.; Andrea O’Donnell, Richard J. Powers of Good Samaritan Hospital in San Jose, Calif.; and Martin L. Lee of Prolacta Bioscience.

This study was supported by funding from the Texas Children’s Hospital Bad Pants Open golf tournament.

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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 and transportation may be available.

FOR MORE INFORMATION ON ANY OF THE FOLLOWING CNRC NUTRITION STUDIES,

Noemi Islam at
713.798.7002 or
nislam@bcm.edu.

Adult Volunteers Needed

H-34291 Healthy, overweight volunteers aged 18 to 65 and volunteers diagnosed with type 2 diabetes within the last three years, also aged 18 to 65, are needed for a metabolic study. These volunteers will help researchers determine whether healthy volunteers, type 2 diabetics and ketosis-prone diabetics make an important compound called arginine in different amounts. Healthy, overweight volunteers should have no chronic medical conditions and all who reply should consume a diet adequate in calories and protein. Women must not be pregnant.

Baylor Infant Twin Study (BITS)

H-36097 Do you expect or have twins less than 4 months of age? We are seeking twin infants for a research study being conducted on twins from 4 months through 3 years of age to learn more about infant and child feeding and behavior. Two visits are required at the Children's Nutrition Research Center and other visits are conducted by mailed questionnaires.

Fatty Liver H-31469 11- to 21-year-old overweight adolescents and young adults with and without liver disease are needed for a research study investigating risk for early heart disease in youth. Study involves body composition, liver scan and blood tests.

VOLUNTEERS

Games for Health (G4H) H-29172 10- to 12-year-old children are needed for a six-month study on how to help them eat healthier and be more physically active. Must play two "Games for Health" video games and provide three blood samples. Sign up at www.g4hstudy.org/s3/Eligibility. Watch game trailers at www.youtube.com/watch?v=K89f7lqFJ-w and www.youtube.com/watch?v=3e2z0L_bpZM.

Teen Heart Health H-30665 12- to 21-year-old adolescents and young adults (any weight) with and without type 2 diabetes are needed for a research study investigating risk for heart disease in youth. Study involves body composition, scan and blood tests. Compensation provided. If interested, call 713.798.6791 or 713.798.6715.

Parents Needed H-38771 Parents of 3- to 5-year-old children are needed for a one-week study to test practices to help their preschooler like and eat vegetables. Before selecting the practices, parents will answer questionnaires, and after, they will be interviewed about their experience, thoughts and feelings about food parenting. Visit www.surveygizmo.com/s3/2748242/VegetableParenting, call Courtney at 832.786.0763 and mention the Food Parenting Study or email foodkids@bcm.edu, if interested.

Children's Sleep Study H-39431 5- to 8-year-old children needed for a 12-month study to help us learn why children gain substantial weight during the summer. Children will wear an activity monitor for one week (two times) and researchers will measure changes in children's heights and weights (three times). If interested, call Courtney at 832.786.0763 and mention the Children's Sleep Study.

