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Pediatric obesity intervention program feasible in primary care clinics

Implementing an obesity intervention program into pediatric clinical practice is a feasible way to work with families to incorporate healthy lifestyle behaviors, according to researchers at the USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine. Their findings appeared in the journal *Child: Care, Health and Development*.

"There have been few obesity intervention programs that have been tested in community pediatric clinics," said Dr. Teresia O'Connor, assistant professor of pediatrics at the CNRC and first author of the paper.

Based on recommendations from the American Academy of Pediatrics, researchers implemented an obesity intervention program called Helping HAND (Healthy Activity and Nutritional Directions) for 5- to 8-year-old children in primary care pediatric clinics in Houston. The children were members of the Texas Children's Health Plan, a Medicaid and CHIP provider in this region.

Five trained TCHP health promotion specialists worked with the families to deliver the six-month program in the child's clinic for the pilot study.

Twenty families with an overweight or obese child were enlisted in the program and another 20 served as the control group. Researchers calculated the body mass index (BMI) of the children and measured their usual eating patterns, physical activity and TV watching behaviors before and after the program.

Each family attended six clinic visits that lasted 45 minutes to one hour. At each visit, they were asked by the health promotion specialist to select from a list of behaviors that they wanted to work on as a family that month. Behaviors included increasing physical activity,

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Study explores relationship between excess body fat and demographic factors in children

A recent study by researchers at the USDA/ARS Children's Nutrition Research Center explores the complex relationship between certain demographic and socio-economic characteristics and adiposity, or excess body fat.

"Obesity in children is a significant concern in this country, and a lot of attention has been paid to the link between obesity and race-ethnicity and income," said Dr. Nancy Butte, professor of pediatrics at the CNRC and one of the authors of the study, which was published recently in the *American*



Journal of Clinical Nutrition.

The epidemiological study is based on 2001 to 2004 data from the National Health and Nutrition Examination Survey (NHANES), a series of studies designed to assess the

health and nutritional status of adults and children in the United States.

This study included more than 5,000 boys and girls aged 8 to 19 years who participated in the NHANES study. Their height and weight were measured, and body fat was measured using dual-energy X-ray absorptiometry, or DEXA, a more accurate way to

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Brain cell response to gut hormone fine tunes stomach emptying

Dieters setting their new year's resolution goals may not have realized the importance of hormones and other biological processes in meeting their target weight, but researchers are helping to shed some light. A hormone produced in the gut acts on brain cells to slow the emptying of the stomach. As a result, you feel full longer and are

less likely to eat again, said researchers from the USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine.

In a report in the *American Journal of Physiology – Endocrinology and Metabolism*, Dr. Xinfu Guan, assistant professor of pediatrics at the CNRC, and colleagues describe their

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Parenting behaviors can influence a child's eating behaviors through college

Many parents start planning for their children's college education before their children even crawl. But parents probably don't consider the impact their mealtime behaviors around their elementary-age children will have years later as these children are in college.

A study by researchers at the USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine and their colleagues at Michigan State University revealed that parent's feeding behaviors with their elementary-age children can relate to the kids' weight and fruit and vegetable consumption when in college. Their report appeared in the *Journal of Nutrition Education and Behavior*.

Dr. Sharon Hoerr, professor of food science and human nutrition at Michigan State University and one of the authors of the paper, spent a 10 month sabbatical at the CNRC in Houston in 2008. Sabbaticals provide established researchers protected time to focus on their research at a new institution to establish collaborations and learn research techniques.

She and colleagues at the CNRC surveyed more than 400 college students from three states on their parents' feeding style when the college students were in elementary school. They also measured the students' body mass index (BMI) and waist circumference and surveyed them on their intake of fruits and vegetables.

"One way that parents can interact with their child is via a parent-centered approach that makes demands of the child

often using guilt induction or pressure perhaps to eat a certain food," said Hoerr. "In contrast is the child-centered approach such as when parents help and encourage their child to make healthy eating choices."

According to Hoerr, research has shown that the parent-centered approach has been negatively related to the child's weight status, food preferences and food intakes, especially in some middle income families.

After reviewing the college students' surveys and measurements, researchers found that those whose mothers followed child-centered feeding practices in early childhood were more likely to have a healthy weight status as well as healthful fruit and vegetable consumption. Those whose mothers used a parent-centered approach had higher weight status and waist circumference.

Hoerr says her CNRC Sabbatical was a rich and intellectually stimulating environment and that more people should consider as a sabbatical leave location.

Others who took part in this study include Dr. Megumi Murashima of Michigan State, Dr. Sheryl O. Hughes of BCM and the CNRC, Dr. Kendra K. Kattelmann of South Dakota State University and Dr. Beatrice W. Phillips of Tuskegee University.

Funding for this study came from the National Research Initiative of the USDA, Cooperative State Research, Education, and Extension Service, and Michigan Agricultural Experiment Station.



Gut Hormone CONTINUED FROM PAGE 1

work that focuses on glucagon-like peptide 2 (GLP-2), a hormone secreted by cells in the gut after a meal. The work delineates the action of GLP-2 on specific neurons in the brain, the so called POMC or proopiomelanocortin-expressing neurons.

"POMC neurons are the key site for this action," Guan said. "It mediates how this gut hormone GLP-2 affects feeding behavior."

The activity is built on a simple principle. If your stomach empties too quickly, you want to eat more. Ingesting more nutrients and keeping your blood glucose higher is a problem, as it can lead to the development of obesity or diabetes.

"If we have some way of slowing the emptying of the gut, then you feel fuller longer and will eat less," he said.

Nature has a way to influence this process, he said. It starts with the production and release of GLP-2 in the gut in response to feeding. GLP-2 is recognized by receptors on the POMC neurons in the brain. As a result, the neurons send a message through the autonomic nervous system (an involuntary system that controls organs such as the stomach, intestines and heart) back to the gut to delay gastric emptying.

"We found there was negative feedback after you eat," Guan said. "You secrete the hormone which activates the neurons in the brain. They then control metabolism and feeding behavior."

He and his colleagues next studied a mouse that lacked the receptor for the hormone only in the POMC neurons in the

brain. The mice ate more food more often. Their gastric system emptied more often, and they became obese as they aged.

When they added GLP-2 directly into a part of the brain called the ventricle, the mice were less likely to eat too much and their gastric system did not empty as quickly as mice in the control group.

The finding might explain the effect of gastric bypass surgery, Guan said.

"When you get rid of part of the stomach after bypass surgery, GLP-2 secretion is enhanced and the person feels full," he said.

If scientists could find a way to enhance the effect of GLP-2 on the brain, then perhaps the need for that kind of surgery might be reduced.

Others who took part in this work include Xuemei Shi, Xiaojie Li, Benny Chang, Yi Wang and Lawrence Chan, all of BCM, and Depei Li of The University of Texas MD Anderson Cancer Center in Houston.

Funding for this work came from the Agricultural Research Service of the U.S. Department of Agriculture (Cooperative Agreement No. 58-6250-0-008, the National Institute of Diabetes and Digestive and Kidney Diseases (Grants DK-075489, DK-084125 and P30DK-079638) and the National Natural Science Foundation of China Grant No. 30728016.

Pediatric Intervention CONTINUED FROM PAGE 1

decreasing the amount of television viewing hours and drinking more water, among others.

“We really wanted this to be driven by the family, so we didn’t want the health promotion specialists telling the families what they had to do. We felt they were much more likely to make changes if they were the ones making the decisions,” said O’Connor.

Families were given worksheets about the behavior they chose to change and worked with the health promotion specialist to set incrementally more difficult goals for the month.

The health promotion specialist worked with the parents to change their interaction with the child to use more supportive and proactive types of parenting practices to help their child achieve their goal by the end of the month, said O’Connor. Proactive behaviors included making fruits or vegetables more available, getting children involved in the preparation of the foods, and providing fun inexpensive toys, such as jump ropes, that promote physical activity.

Families were asked to track the progress on the parenting behaviors they were going to change as well as the child’s behavior toward reaching their goal.

“The goal of the study was not to see if the program was effective, but to see if it was possible to put this in clinics, whether families would attend and what families thought of the program,” said O’Connor.

Researchers found that there was a lot of interest in the program, with 80 percent of the families continuing in the study after six months.

At the end of the study, families were positive about their experiences. There was no significant difference in weight improvement between the intervention group and the control group, but researchers did find a significant improvement in the amount of television that the children watched in the intervention group versus the control



group. At the end of the study, children in the control group were watching about 23 hours of television per week, whereas those in the intervention group were watching about 15 hours per week.

“This helps guide us in the future in making television reduction a bigger component of our future treatment programs,” said O’Connor.

Researchers also found improvements in parenting behaviors and practices—they reported being more supportive of physical activity and more likely to get their children involved in picking and preparing foods.

The information gained from this study provides O’Connor and her team with valuable information on how to best develop healthy weight programs for pediatric clinics and test such programs in future larger scale studies.

Others who took part in the study include Dr. Tom Baranowski of BCM, Angela Hilmers and Kathleen Watson, formerly with BCM, and Dr. Angelo Giardino of Texas Children’s Health Plan.

Funding for this study came from the USDA/ARS.

Volunteers

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. Financial compensation is provided for most studies, and transportation may be available.

For more information on any CNRC study call Marilyn Navarrete, 713.798.7002, or e-mail rilynn@bcm.edu.



IBS & Gut Bacteria NEW!

Researchers are interested in learning about gut bacteria in healthy adolescents and in those with chronic belly pain.

Stomach Pain & Genetics NEW!

Do you have a child age 7 to 18 with recurrent abdominal pain (stomach aches)? Do they have a brother, sister, step-brother, step-sister and/or adoptive sibling age 7 to 18 living at home with them? You may be eligible for a research study about the environment and genetics of stomach aches. We will visit your home and provide all materials needed for the study.

Butterfly Girls

8- to 10-year old African American girls and a parent needed to participate in an 8-week online program promoting healthy eating and physical activity. No meetings to attend. Participate from the comfort and convenience of home. Watch an informative video on the program at <http://www.bcm.edu/cnrc/butterflygirl/butterflygirlintrovideo.html>.

Fatty Liver

13- 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.

Stomach Pain & Bacteria

Do you have a child between 7 to 12 years of age? We are seeking children who either often have stomach aches or never have stomach aches. We are doing a research study to learn how bacteria in our body keep us healthy or cause problems. It’s easy and there is no pain!

Breakfast Study

Children who are 8 to 10 years old are needed for a study on breakfast consumption and mental abilities. The study includes three overnight visits to the CNRC.

There will be blood draws at each visit (numbing creams and sprays are available).

Cardiovascular Study

13- to 18-year old adolescents and young adults (normal weight and overweight) with and without type 2 diabetes are needed for a research study investigating risk for heart disease in youth. Study involves body composition, heart scan and blood tests.

Puberty & Insulin Resistance

Texas Children’s Hospital along with Baylor College of Medicine is recruiting people to participate in a research study to see how weight and puberty influence sugar metabolism. We are seeking both lean and overweight children who are approximately 8 to 15 years old. The study requires two office visits in a research unit. A no-cost health exam will be included. Saturdays and Sundays are available for your visits.

Pregnancy & Child Health

Did you have a pregnancy complicated by preeclampsia or a baby with low birth weight? Can a complicated pregnancy in mom put the child at risk for future health problems? To answer this question, we are conducting a research study that looks at pregnancy history and its effect on the child’s health. 8- to 11-year old children of both eclamptic and non-preeclamptic pregnancies are needed as well as 8- to 17-year olds of pregnancies with high blood pressure. Study involves body composition and blood tests.

Diet and Stomach Pain

Does your child have stomach pain that you believe is related to his/her diet? Children between the ages of 7 and 17 are needed for a research study. Researchers are interested in learning more about the role of diet in childhood stomach pain. Participants will be asked to start a specific diet on two separate weekends to determine whether this will help the pain. Food will be provided.

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Body Fat Factors CONTINUED FROM PAGE 1

determine body fat than standard body mass index measurements.

Demographic and socio-economic factors evaluated in the study included race-ethnicity, age, income, family size and birth place.

The study showed that the association between demographic-socioeconomic factors and adiposity among U.S. children varied substantially by age, sex and race-ethnicity.

"All of these factors—age, race-ethnicity, income, family size and birth place—only account for 2 to 11 percent of difference in body fat. There are other significant factors at play, including genetics, diet and level of physical activity," Butte said.

However, the study did show that the prevalence of excess fat was higher in both Mexican American boys and girls than in white and black boys and girls. It also found that Mexican American boys and girls who were born in the United States rather than those born in Mexico had higher body fat.

"These data reflect acculturation concerns about adapting to a new and different lifestyle and how that relates to the development of obesity," Butte said.

Results from this analysis of NHANES data showed that adiposity was inversely related to family income in Mexican American girls and in white boys and girls, meaning that in these groups, lower family income was associated with higher body fat.

The unacceptably high rates of excess fat pose a health risk for all racial-ethnic groups. However, the highest rates among Mexican American boys and girls, and black and white girls, the higher adiposity in some children from lower-income families and among Mexican Americans born in the United States has important policy implications. If resources are limited, pediatric obesity interventions might target lower-income minorities to help reduce racial-ethnic disparities.

Others involved in the study included Dr. Tuan Nguyen, former postdoctoral fellow of the CNRC, and Dr. Youfa Wang of Johns Hopkins Global Center on Childhood Obesity.

The study was supported by research grants from the National Institute of Diabetes and Digestive and Kidney Diseases, the National Institute of Child Health and Human Development and the Thrasher Research Fund.