

School-Based Obesity Treatment: The MATCH Program

Suzanne Lazorick, Yancey Crawford, George T. Hardison

Motivating Adolescents with Technology to Choose Health (MATCH) is a curriculum for middle school students developed by one of the authors (G.T.H.) when he was a science teacher in Martin County, North Carolina, where obesity rates are extremely high. The program is based on insights gained from studies of school-based interventions [1, 2]. It adopts a behavioral approach widely applied in health promotion, one that is based upon the social cognitive theory of self-regulation [3]. MATCH combines what is known about how children learn best in a classroom setting with strategies for promoting behavior change. The curriculum has 4 essential elements: It provides students with information about the unhealthy effects of overweight, teaches them specific self-regulation health skills, gives them individualized tasks that require them to apply those skills, and reinforces the skills with age-appropriate external motivational strategies.

MATCH takes an interdisciplinary approach to student wellness: The curriculum includes lessons on nutrition, physical activity, and technology, and the program provides teachers with a Web-based resource system that allows them to meet educational and wellness objectives simultaneously. The lessons, which are delivered over a 16-week intervention period, are aligned with National Common Core Curriculum Standards. They are designed to parallel the North Carolina Standard Course of Study for seventh grade and are taught embedded within existing curriculum rather than requiring additional instructional time.

When MATCH is implemented in a school, all seventh-grade teachers are trained to deliver MATCH lessons within their subject area, and one teacher serves as the coordinator. All materials are available for download from a secure Web site, and students complete lessons in a student-friendly workbook. Students learn about the body system by system (eg, cardiovascular system, endocrine system) as a structure for the sequenced series of inter-

disciplinary lessons and receive intermittent rewards for completion of MATCH-related activities. All students receive the same intervention regardless of weight category; the only time weight status is noted is during the student's self-categorization, which is completed privately.

Because the program lasts 16 weeks and is integrated across subjects, students are able to acquire the knowledge and skills they need to begin internalizing positive health behaviors. Lessons are taught in health, science, math, language arts, and technology classes, and cover such topics as energy balance, peer accountability contracts, body mass index (BMI) calculation, and persuasive writing. At the beginning and end of the program, height, weight, fitness level, and health behaviors are measured. All results are entered into the Web-based system by teachers, and key data are shared with the students, who use this information to establish health-related goals and to develop action plans for weight management.

The program's objectives are aligned with those of the Coordinated School Health program of the Centers for Disease Control and Prevention, and it follows recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity outlined in the report of an expert committee consisting of representatives from 15 professional organizations [4]. First offered in 2006, the MATCH program is now being implemented in 15 public schools in eastern North Carolina during the 2012-2013 school year. More information is available at www.MATCHwellness.org.

MATCH is now a community-academic partnership led by 2 of the authors—G.T.H. and S.L.; the latter is an obesity-focused preventive medicine pediatrician at East Carolina University (ECU). In 2008, the North Carolina State Board of Education selected MATCH for pilot expansion as a promising school-based obesity intervention. Through funding from the Blue Cross and Blue Shield of North Carolina Foundation and the Kate B. Reynolds

percentile and below the 95th percentile is considered to be overweight; and one whose BMI is at or above the 95th percentile is considered to be obese. Because BMI is based on height and weight, which are regularly measured during primary care visits, obesity screening can occur at the same intervals as standard well-child care beginning at age 2 years. For children younger than 2 years, the ratio of weight to length can be used rather than the ratio of weight to height, and those whose ratio puts them at or above the 95th percentile for children of the same age and sex are considered to be overweight.

Pediatric primary care providers who screen for and document overweight and obesity are more likely to counsel patients and their parents about diet and exercise [11]

and to screen and refer for comorbidities of overweight [12]. Use of toolkits encouraging screening and communication is associated with change in parental perception of overweight and positive dietary and physical activity changes [13]. Parents with accurate perception of weight status are more likely to be ready to make weight-related behavioral changes [14]. Lack of communication with families about weight status of overweight children is the strongest predictor of parental misclassification of a child, and pediatricians need to remember that their opinions are highly valued by patients [15].

The majority of parents with overweight children do not recognize that their overweight child weighs too much [16], and even fewer have ever been told by a clinician that their

Charitable Trust, G.T.H. now directs MATCH as an ECU employee. The program has maintained its long-standing relationships with several school districts that were part of the original expansion, including those in Martin, Washington, and Pitt counties. Districts in Pamlico, Hyde, Halifax, Edgecombe, and Chowan counties are also now participating. Since 2006, approximately 2,500 students have completed MATCH.

Using data from 2006 and 2007, we conducted a single-site study (using pre-post design) during the first 2 years of MATCH in 2 cohorts. Both cohorts received the same intervention and represented 2 sequential school years of 7th graders. One year after completion of MATCH, the proportion of students in cohort 1 ($n = 92$) with a BMI indicating a healthy weight increased from 45% to 53%, and the proportion of students in cohort 2 ($n = 106$) with a BMI indicating a healthy weight increased from 53% to 59% [5]. In no other study of a school-based intervention of this sort have such substantial and sustained improvements been found. In 2011-2012, with different teachers delivering the intervention in the same school and in 6 additional schools, the number of lessons taught varied widely, from 14 to 50. Decreases in BMI Z-scores similar to those seen in the original pilot program were achieved in 2 of the 7 schools. In addition, in nearly all schools there was improvement in fitness as measured by the validated Progressive Aerobic Capacity Endurance Run (PACER) test, which is a component of Fitnessgram, a standardized fitness test [6]. Variations in the number of lessons taught and in outcome measures are notable. The focus in further expansion will be to improve program fidelity and attain more consistent results at all participating schools, using a more rigorous study design. Evaluation is ongoing in the 15 schools currently participating.

Although nutrition and physical activity policy and environmental changes are needed to prevent obesity, an entire generation lives in an obesogenic environment now, characterized by cultural trends that decrease opportunities for physical activity and increase access to energy dense foods. MATCH offers an intense, theory-based, individual-focused, school-based model to counteract this environment while simultaneously meeting educational objectives. Because MATCH has been intentionally de-

veloped for widespread expansion, it offers a promising opportunity for merging public health missions with educational ones. **NCMJ**

Suzanne Lazorick, MD, MPH associate professor, Department of Pediatrics and Public Health, Brody School of Medicine, East Carolina University, Greenville, North Carolina.

Yancey Crawford, MPH program coordinator, Department of Pediatrics, Brody School of Medicine, East Carolina University, Greenville, North Carolina.

George T. Hardison, Jr, MA program director of MATCH, Department of Pediatrics, Brody School of Medicine, East Carolina University, Greenville, North Carolina.

Acknowledgments

Financial support. Funding for MATCH is provided by the North Carolina State Board of Education, the Blue Cross and Blue Shield of North Carolina Foundation, and the Kate B. Reynolds Charitable Trust.

Potential conflicts of interest. All authors have no relevant conflicts of interest.

References

1. Franks A, Kelder SH, Dino GA, et al. School-based programs: lessons learned from CATCH, Planet Health, and Not-On-Tobacco. *Prev Chronic Dis*. 2007;4(2):A33.
2. Budd GM, Volpe SL. School-based obesity prevention: research, challenges, and recommendations. *J Sch Health*. 2006;76(10):485-495.
3. Bandura A. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs: Prentice-Hall; 1986.
4. Barlow SE; Expert Committee. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. *Pediatrics*. 2007;120(suppl 4):S164-S192.
5. Lazorick S, Hardison GT, Esserman DA, Perrin EM. Sustained body mass index changes one and two years post MATCH: A school-based wellness intervention in adolescents. *Childhood Obesity*. 2011;7(5):372-378.
6. Welk GJ, Meredith MD, eds. *Fitnessgram/Activitygram Reference Guide*. Dallas, TX: The Cooper Institute; 2008.

Electronically published February 8, 2013.

Address correspondence to Dr. Suzanne Lazorick, East Carolina University, Brody School of Medicine, Warren Life Science Building Suite 174, 600 Moye Blvd, Mail Stop 680, Greenville, NC 27834 (lazoricks@ecu.edu).

N C Med J. 2013;74(1):35-36. ©2013 by the North Carolina Institute of Medicine and The Duke Endowment. All rights reserved. 0029-2559/2013/74105

child is overweight [17]. Many pediatricians are not screening adequately for early weight trends of concern. Or if they do screen, they are not conveying that information to parents and making appropriate follow-up recommendations. Parents want to know their child's weight status, and they find the term "unhealthy weight" quite motivating [18]. Although only 54% of parents believe that it is very important to seek medical attention for overweight children, 94% say that they would seek care for conditions that limit life expectancy [19]. This suggests the need to frame obesity as a health problem. Obesity screening is being attempted in many places including schools and communities, but primary care physicians have been recognized as important communicators of weight-related messages.

Communicating the Results of BMI Screening to Parents

Despite clear definitions for overweight and obesity across all ages, ensuring that parents understand the results of BMI screening remains a challenge. One reason for this is that children, particularly those aged 3-8 years, have a naturally low percentage of body fat, so a child at the 95th percentile for BMI will often appear to parents to be at a healthy weight or even "skinny." Indeed, these children do not appear overweight by adult standards, so one cannot trust visual impressions. These children are at higher risk for their growth trajectories to continue to be overweight throughout childhood and into adulthood [20].