

Before-school physical activity program helps improve body weight and overall wellness

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Credit: Robert Kraft/public domain

Children participating in a 12-week, before-school physical activity program experienced improvement in body weight and social/emotional wellness, compared with their classmates who did not participate. Investigators from MassGeneral Hospital for Children (MGHfC) report the results of their study of the BOKS (Build Our Kids' Success)

Program in a paper that will appear in the April issue of the *American Journal of Preventive Medicine* and is being released online.

"We know that physical activity can have positive effects on children's health - ranging from decreased rates of obesity and obesity-related illnesses to improving school performance and overall well-being," says Rachel Whooten, MD, postdoctoral fellow in the MGHfC Division of General Academic Pediatrics, and first author of the study. "Despite these benefits, it's often hard for children and families to find opportunities to be physically active. Our study evaluates a widely available, easily scalable and innovative program that may create more physical activity opportunities for school-aged children."

An initiative of the Reebok Foundation, which was a co-sponsor of the current study, the BOKS Program is currently available in more than 3,000 elementary and middle schools in the U.S. and other countries. Following a 12-week curriculum, the program provides hour-long, before-school sessions up to three days a week. Each session begins with a warm-up game, followed by a running-related activity; activities incorporating "skills of the week," such as push-ups or sit-ups; a game to end the session, and nutrition discussions during stretching and cool-down. Sessions are led by volunteers, who have been trained with BOKS program materials. While the training, BOKS curriculum and support materials are provided to participating schools at no cost, schools need to provide some basic supplies as well as locations for the program.

Previous small studies have documented improvements in body fat and aerobic performance in BOKS participants, compared with nonparticipants. The current study was designed to evaluate both how a 12-week BOKS program affects participants' body mass index (BMI) and whether any differences resulted from participating two or three times a week. In 24 elementary and middle schools in three eastern Massachusetts communities during the 2015-16 school year, the parents

of all students in grades K-8 were invited to enroll their children in the BOKS program and the study. Parent of those not participating in BOKS could allow their children to participate in the comparison group.

School districts determined whether the program would be offered two or three times a week, depending on resources and preferences. Twice-a-week sessions were offered at 16 schools, while 8 schools conducted sessions three times a week. Overall, 274 children participated in the twice-a-week program, 151 in the three-times-a-week program, and 282 in the comparison group, for a total of 707 study participants. In addition to measurements of height and weight taken before and after the 12-week program, participants ages 8 and older completed surveys evaluating their social and emotional wellness - including their overall mood, interaction with peers, satisfaction with their lives and involvement in their studies.

At the end of the 12-week BOKS program, children participating three times a week had significantly better BMI z scores - an age- and sex-specific measure used to track changes in weight status - and a greater chance of moving to a lower BMI category - such as normal instead of overweight - than did children in the comparison group. Three-times-a-week participants also had better scores regarding their engagement in schoolwork, while those in the two-times-a-week group had significant improvements in mood, vitality and energy.

Elsie Taveras, MD, MPH, chief of the MGHfC Division of General Academic Pediatrics, who led the study, explains that the before-school nature of the BOKS program offers several advantages, including not conflicting with after-school activities and family commitments. "The program's structure in which volunteers from within the school receive brief training and then follow a standard curriculum can overcome the concerns of some teachers and parents that they don't have the knowledge to help kids be more active. The flexibility of the BOKS

program and the lack of a required investment in material resources can be helpful for schools with limited equipment and financial resources."

Three elementary and [middle schools](#) in the eastern Massachusetts city of Revere have implemented the BOKS program for the current school year as part of a new study, led by Whooten, that is now underway. Barbara Kelly, principal of the Paul Revere Innovation School, says, "The BOKS program has become vital to the fabric of our school. The morning program sets the tone for each participating student's day. Their engagement and excitement in BOKS has carried over to the classroom, with parents and teachers alike having seen academic improvement. Students thrive on the program's structure and are so proud to belong to the club. I can't imagine not having BOKS in our school."

A professor of Pediatrics at Harvard Medical School, Taveras adds, "Childhood is an important time for the establishment of healthy habits and routines that might protect children from chronic diseases including obesity, heart disease, and depression, which are the biggest contributors to morbidity and mortality in the U.S. Programs such as BOKS that help children not only develop healthy habits to promote optimal growth trajectories but also promote social and emotional skills that can help them better handle stress, peer interactions, and negative feelings are just what children need and should be broadly scaled. The program's being [school](#)-based and run by volunteers gives it the potential of affecting a large number of [children](#) equitably without the need for substantial resources."

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