

New Approach to School Health Initiatives: Using Fitness Measures Instead of Body Mass Index to Evaluate Outcomes

Abstract

Oklahoma Cooperative Extension Service provided elementary school students with a program that included a noncompetitive physical activity component: circuit training that combined cardiovascular, strength, and flexibility activities without requiring high skill levels. The intent was to improve fitness without focusing on body mass index as an indicator of fitness. Youths (111) in grades 3–5 underwent President's Council on Fitness, Sports, and Nutrition testing at baseline and program completion. Significant improvements were observed in average fitness measures among youths who participated in the circuit training. Extension professionals looking for new tools to use with school-based physical activity programs may consider circuit training as a noncompetitive means of improving youth physical fitness and fitness measures as more appropriate outcome indicators.

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Introduction

Increases in overweight and obesity rates among children have resulted in increased awareness of the need for school-based nutrition and physical activity programs (Vierregger et al., 2015; Williams & Mummery, 2015). Although body mass index (BMI) is often used as a means of evaluating the results of interventions, BMI is not necessarily the most valid indicator of program effectiveness (Burns, Hannon, Brusseau, Shultz, & Eisenman, 2013). Shortcomings of the use of BMI as a program effectiveness measure include ethnic and gender differences associated with BMI, natural increases in children's BMI values, and the stigma associated with BMI reports (Portilla, 2011; Scheier, 2004). Initiatives focusing on increasing physical activity and physical fitness among children should include attention to indicators of physical fitness. Moreover, Extension professionals must take care when addressing issues related to body weight and body image among youth, as suggested by Majka (2011): "Extension professionals who work with youth are often faced with issues of body weight . . . and/or body image. How we handle these topics has the potential to either help or harm" (Abstract). One purpose of the project discussed in this article was to create an initiative to facilitate improved health behaviors among youths attending elementary school in a rural area of Oklahoma by focusing on physical fitness rather than BMI.

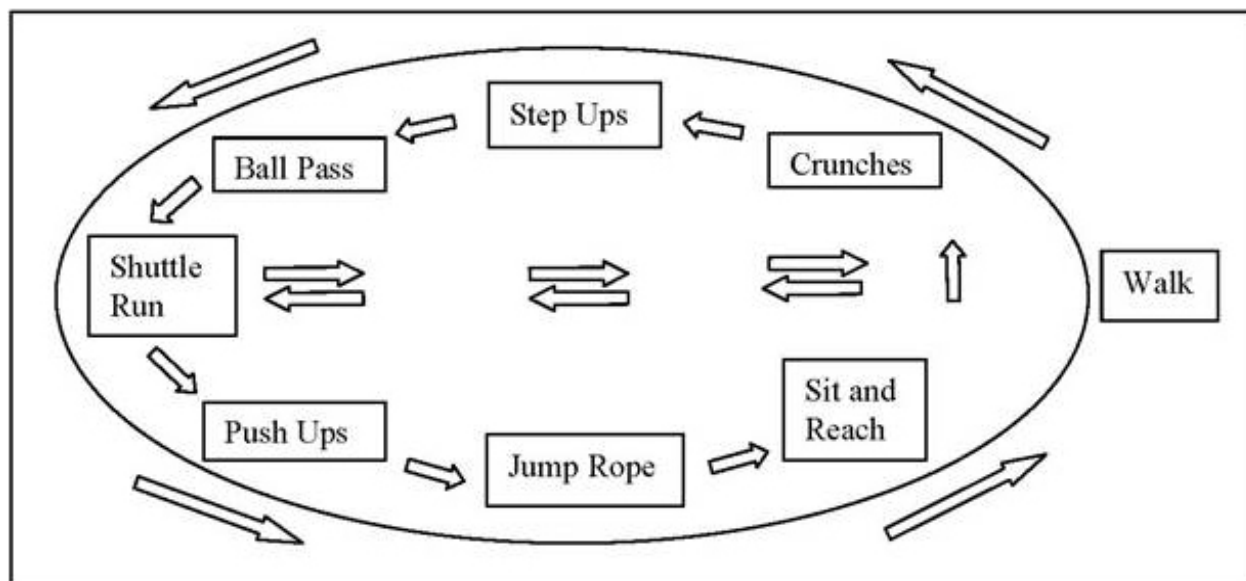
Health Day Program Description

On the basis of findings gathered through participatory action research methods, Oklahoma Cooperative Extension Service provided a Health Day program in collaboration with the school's physical education teacher. The program was implemented 1 day a week during students' physical education class. It focused on improving personal health and was noncompetitive. One component of the program was circuit training. Circuit training provides combined cardiovascular, strength, and flexibility training without requiring high skill levels, making it appealing and safe for students with lower skill levels. The circuit training component provided a way for students to work toward improving personal fitness skills in alignment with the President's Council on Fitness, Sports, and Nutrition program. The Health Day program included a personal goal-setting activity whereby youths set personal nutrition and health goals and kept journals to self-evaluate progress toward those goals. The project was approved by the Oklahoma State University Institutional Review Board for Human Subjects.

Circuit Training Description

Circuit stations were set up around a perimeter. Each circuit station activity was indicated on a large piece of paper posted on the wall or floor (Figure 1).

Figure 1.
Circuit Training Setup



Youths were organized in equal-sized groups on the basis of the number of circuit stations. For the particular setting involved in the Health Day program, eight stations with about three or four youths per station worked well. Each group began at a different station. Youths performed the circuit station activity for 2 min. At the end of 2 min, all youths walked around the perimeter for 2 min. At the end of the walking period, youths stopped at the next station from where they were in the rotation. This process was repeated until all students had completed the circuit. Completion of the circuit took about 30 min.

The amount of time at each station and/or the amount of time for walking around the perimeter can be adjusted to fit the time available. The number of stations and station activities can be modified to meet the needs of the school setting, the number of youths, the ages of youths, or individual youth needs, or to add variety.

Program Evaluation

The school collected data on students' ages and President's Council on Fitness, Sports, and Nutrition program testing for fitness for third-, fourth-, and fifth-grade youths who participated in the Health Day program. These data were collected in the fall at baseline prior to students' beginning the Health Day program and again in the spring after their completion of the Health Day program. The data were analyzed with paired *t*-tests, using PC SAS for Windows, Version 8. Significance level was set at $p < .05$.

Results

In all, 111 third-, fourth-, and fifth-grade youth completed the testing for fitness at both baseline and completion of the Health Day program; 55 were boys and 56 were girls. The mean age in years for boys was 10.1 (± 0.1) at baseline and 10.8 (± 0.1) at program completion. The mean age in years for girls was 10.0 (± 0.1) at baseline and 10.7 (± 0.1) at program completion. Significant improvements were observed among youth who participated in the Health Day circuit training component relative to President's Council on Fitness, Sports, and Nutrition measures for crunches, shuttle run, sit and reach, and push-ups (Table 1).

Table 1.

Effect of Circuit Training on President's Council on Fitness, Sports, and Nutrition Fitness Measures

Fitness measure	Boys ($n = 55$)		Girls ($n = 56$)	
	Baseline	Completion of program	Baseline	Completion of program
Crunches (number)	49.7 \pm 2.0	53.9 \pm 1.4*	44.8 \pm 2.0	48.8 \pm 1.6*
Shuttle run (sec)	12.1 \pm 0.2	10.7 \pm 0.2*	12.4 \pm 0.2	11.1 \pm 0.1*
Sit and reach (cm)	20.1 \pm 1.2	25.4 \pm 1.0*	28.1 \pm 1.0	29.6 \pm 0.9*
Push-ups (number)	12.4 \pm 1.5	14.7 \pm 1.5*	7.5 \pm 0.8	10.1 \pm 0.9*

*Significant difference between baseline and completion of circuit training component, $p < .05$.

Implications

Studies have shown that improved fitness is correlated with improved health parameters, regardless of BMI (Blair & Church, 2004; Burns et al., 2013; Dubose, Eisenmann, & Donnelly, 2007). The circuit training component of the Health Day program facilitated increased fitness measure scores over time. Circuit training provided a noncompetitive environment that allowed students to engage in various physical activities, improving fitness through increased physical activity while not relying on BMI as a motivating factor. Extension professionals can use fitness as an outcome indicator in an age of outcomes-oriented programming. Physical fitness indicators are alternate health indicators that are less stigmatizing than weight-based indicators, such as BMI. Instilling a feeling of confidence in one's ability to engage in physical activities at a young age may increase the likelihood of

such behaviors carrying into adulthood. Physical education is an important part of a successful curriculum, and being creative with the minimal resources available at some rural schools may be the difference between teaching children how to engage in healthful behaviors and seeing them remain sedentary on the sidelines.

Acknowledgment

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