

The Relationship Among Playground Areas and Physical Activity Levels in Children

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ABSTRACT

Introduction: Almost 20% of American children aged 6 to 11 years are obese. A decrease in physical activity has been associated with an increase in obesity. The school environment is one place where many children can be reached. This cross-sectional study determined which types of playground areas attract children and promote moderate to vigorous physical activity (MVPA) or sedentarism.

Method: Children on two urban elementary school playgrounds (one of which offered a jogging program called Jog and Walk Stars [JAWS]) were observed before school with use of the System for Observing Play and Leisure Activity in Youth and System for Observing Play and Recreation in Communities observational tools. Descriptive statistics, paired-samples *t* tests, and independent-samples *t* tests were used to analyze the data.

Results: The highest populated areas for schools K and B on non-JAWS days were the general blacktop areas; however, approximately 50% of the children in these areas were sedentary. At school B on days when the JAWS program was offered, the highest populated area was the JAWS track, and 99% of those children participated in MVPA. There was a significant difference in counts for average total sedentary children per square foot between school K ($M = 216.70$) and school B on JAWS days: $M = 80.38$, $t(22.02) = 2.24$, $p < .5$, two-tailed.

Discussion: A playground environment assessment to identify areas that promote MVPA, such as offering a JAWS program, may be one avenue to address the need for increasing MVPA levels in children in general, in addition to physical education class, and help them obtain the recommended 60 minutes of daily MVPA. *J Pediatr Health Care.* (2015) 29, 156-168.

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Conflicts of interest: None to report.

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KEY WORDS

Child physical activity, childhood obesity, playground environment, recess, child health

Almost 20% of children aged 6 to 11 years are obese in the United States, a rate that is three times higher than that of 10 years ago ([National Center for Health Statistics, 2010](#)). Childhood obesity is a prevalent health disorder; its cause is multifactorial, and it can lead to major health complications, including type 2 diabetes, high blood pressure, osteoporosis, and elevated cholesterol ([Dietz, 1998](#)). Inactivity is a risk factor for childhood obesity ([Singh, Siahpush, & Kogan, 2010](#)). Children who are physically active benefit both psychosocially and physically ([Lobstein, Baur, & Uauy, 2004](#)). Additionally, children who are physically active often carry this healthy habit into adulthood ([Telama et al., 2005](#)).

Physical activity (PA) levels are typically categorized as sedentary, moderate, and vigorous. The U.S. Department of Health & Human Services (USDHHS, 2008) recommends that children participate in at least 60 daily minutes of moderate to vigorous physical activity (MVPA) to promote health and fitness. The Patient Protection and Affordable Care Act has identified schools as an environment for health education, prevention, and early intervention for children, and “schools are recognized as logical partners to provide community-based services” (National Coordinating Committee on School Health and Safety, 2010, p. 1). Additionally, the USDHHS (2010) recommends that schools provide a significant portion of students’ daily PA, which could be done during leisure time on the playground, such as during recess, or before and after school. Leisure time is considered noncurriculum time allocated by schools for children to engage in activities of their choice (Ridgers, Stratton, & Fairclough, 2006). Moreover, elementary schools are an important environment for providing MVPA for children because they spend many of their waking hours there, and it is a setting that reaches large numbers of children (Lounsbery, McKenzie, Morrow, Monnat, & Holt, 2013). Therefore, school interventions designed to increase MVPA have the potential to decrease the risk of childhood obesity.

In addition to school personnel, medical authorities, including school nurses, can be valuable assets in improving children’s fitness. To this end, nurses have been called to help with the prevention of childhood obesity by using advocacy and collaborative leadership. The ability to be a leader of change at the community level is an important skill of expert nurses. Nurses working in child health can collaborate with school officials and help them understand the health issue and the impact it will have on children (Berkowitz & Borchard, 2009).

PA in the school environment can be promoted in the classroom several ways, such as by using active transport to school, on the playground, or during physical education (PE) class. This study examined PA on playgrounds before school hours. Playground environments can be separated into target areas, which are predetermined observation sites in which children may potentially engage in PA (McKenzie, 2006a). Designating target areas provides a systematic way to evaluate PA on playgrounds.

Additionally, research is limited on the relationship between offering an organized PA program and PA levels in children on playground environments during school leisure time (McKenzie, Crespo, Baquero, & Elder, 2010). One of the schools evaluated in this study offered an organized jogging and walking program, Jog and Walk Stars (JAWS), in a target area on the playground. Therefore, the primary aim of this study is to determine which types of playground areas attract children and promote MVPA or sedentarism in two urban

elementary schools in the southwestern United States. The secondary aim of this study is to determine the relationship between PA levels and offering an organized jogging and walking program in a target area.

An environmental assessment of two playgrounds provides insight into whether certain types of playground areas are more effective in promoting MVPA and inviting use. If certain types of areas are more effective, a study with a larger sample could be performed to determine if schools should expand the playground area spaces that invite use and promote MVPA and minimize areas that do not promote MVPA. Additionally, conditions that promote MVPA, such as offering a jogging and walking program in a playground space, could be further studied with large sample sizes.

The following key research questions were used to guide the direction for the study:

- Research question 1: Where on the playground are children, boys, and girls spending their time during leisure period before school hours?
- Research question 2: How do the PA levels of children, boys, and girls differ within each school based on playground design type?

Questions 3 to 5 specifically focus on the PA related to offering an organized PA program in a target area:

- Research question 3: Are there statistically significant differences in PA levels of children, boys, and girls before school hours at school B on JAWS days versus non-JAWS days?
- Research question 4: Are there statistically significant differences in PA levels of children, boys, and girls between a school that offers free play and one that offers an organized PA program before school hours in a playground area?
- Research question 5: Are there statistically significant differences in PA levels of children, boys, and girls before school hours between school K and school B on non-JAWS days?

REVIEW OF THE LITERATURE

As a result of the increasing prevalence of overweight and obesity in children (Ogden, Carroll, Kit, & Flegal, 2014), along with the rise in inactivity in children (Kohl III & Cook, 2013), the promotion of PA is a public health concern (Ridgers, Saint-Maurice, Welk, Siahpush, & Huberty, 2011). PA has also been associated with improving attention skills during school (Bates, 2006; Evans & Pellegrini, 1997; Gapin, Labban, & Etnier, 2011; Pellegrini & Bohn, 2005) and obtaining higher grades (Coe, Pivarnik, Womack, Reeves, & Malina, 2006; Zan, 2013). Moreover, PA gained from school outside of classroom time can also help socially (e.g., with sharing, cooperation, communication, and problem solving), emotionally (e.g., with stress relief, self-esteem, and character development), and

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