



Neighborhood, family and individual characteristics related to adolescent park-based physical activity



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ABSTRACT

Background. Local parks are an important community resource that may influence levels of physical activity among youth. However, few population-based studies have investigated park-based physical activity among youth.

Purpose. This study examines sociodemographic, family, and neighborhood characteristics associated with park-based physical activity among adolescents.

Methods. Data were from the 2007 California Health Interview Survey (CHIS), a population-based survey of California households, and were analyzed in 2012–2013 and 2015. This study examined individual (age, gender, race/ethnicity, and nativity), family (household income, parental education, and nativity), and neighborhood characteristics (urbanicity, perceived park availability, perceived park safety, neighborhood income, and racial composition) associated with engaging in park-based physical activity among adolescents.

Results. In California, 71% of adolescents reported being physically active the last time they visited a park. In adjusted multinomial logistic regression analyses, older adolescents and females were less likely to be physically active in parks. Adolescents with a park within walking distance of home and those with a safe park nearby were more likely to be physically active during a park visit.

Conclusions. Park availability and perceptions of park safety are important predictors of engaging in park-based physical activity among adolescents. These findings provide information that can help inform interventions intended to increase physical activity among youth. Strategies that increase availability and safety of parks and other recreation spaces may be particularly effective.

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Background

Obesity is a major public health concern, especially among adolescents in the US. Obesity during early childhood and adolescence has been associated with increased risk of obesity in adulthood (Berenson and Srivivasan, 2005; Kvaavik et al., 2003; Singh et al., 2008). Additionally, obesity is a risk factor for many chronic diseases, including heart disease and type 2 diabetes (Eckel and Krauss, 1998; Wannamethee and Shaper, 1999). Insufficient physical activity contributes to obesity among adolescents, and regular physical activity has positive effects on musculoskeletal development, cardiovascular health and adiposity, and weight gain (Delva et al., 2007; Strong et al., 2005; US Department of Health and Human Services, 1996). National guidelines recommend that children and adolescents engage in at least 60 minutes of physical activity each day (U.S. Department of Health and Human Services, 2008).

Parks and other places to engage in physical activity provide an important resource that may influence levels of physical activity among adolescents (Babey et al., 2008; Cohen et al., 2006). Several studies have reported on barriers to and correlates of park use. In addition, a growing body of research has examined the association of access to parks and park characteristics with overall physical activity. However, relatively few studies have examined park-based physical activity among adolescents.

Common barriers to park use include not having a park in the community, safety concerns, and poor maintenance of park facilities (Carlson et al., 2010; Mowen et al., 2005), while proximity to local parks has been associated with greater park use (Cohen et al., 2007). In addition, studies examining the association of access to parks with overall physical activity suggest that both proximity to parks and having more parks or greater park area are associated with greater levels of physical activity among youth (Brownson et al., 2001; Cohen et al., 2006; Frank et al., 2007; Kaczynski and Henderson, 2007; Roemmich et al., 2006). Research on the contribution of parks to physical activity also suggests that the availability and quality of park facilities, amenities, and programmed activities are positively associated with physical

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activity (Cohen et al., 2007, 2009, 2013; Kaczynski and Henderson, 2007; Kaczynski et al., 2008; Ries et al., 2009; Shores and West, 2008).

Despite the growing number of studies examining the contribution of parks to physical activity, relatively few studies have examined the factors that influence physical activity that occurs in parks. Research in this area suggests that males, younger people, and whites are more active in parks (Floyd et al., 2008a; Kaczynski et al., 2011). Studies conducted in parks or in neighborhoods surrounding parks suggest that park characteristics such as the availability of facilities, staffing, and programming are positively related to park-based physical activity (Cohen et al., 2012; Kaczynski et al., 2010). Other research has suggested that neighborhood factors such as lower neighborhood income and higher concentrations of Hispanic or African American residents are related to greater park-based physical activity (Floyd et al., 2008a, 2008b).

Among studies that have examined park-based physical activity, very few have focused on youth. The few studies that have focused on youth have found that boys are more active than girls, and white youth are more active than non-white youth in parks (Floyd et al., 2011; Kaczynski et al., 2013). In addition, previous research has found that park features (i.e., activity area type, and the number of recreation facilities, and formal activities available) were positively associated with physical activity in the park, while neighborhood characteristics (i.e., urban form and racial heterogeneity) were not (Floyd et al., 2011; Spengler et al., 2011).

The existing research has not used population-based samples to examine correlates of park-based physical activity among adolescents. These studies consisted mainly of observational studies of park users, often relying on smaller local surveys. For example, one of the studies observed children and adolescents using sampled parks in Durham, NC, and the other observed users in selected parks in Kansas City, MO (Floyd et al., 2011; Kaczynski et al., 2013). In addition, previous studies have not examined park-based physical activity among adolescents using a wide range of individual and family characteristics (e.g., race/ethnicity, household income, and parental education) as well as neighborhood characteristics (e.g., perceptions of park availability and safety and neighborhood racial composition). This study examines individual sociodemographic, family, and neighborhood characteristics associated with park-based physical activity among adolescents using population-based data, which includes important factors not available in previous studies of park-based physical activity for this age group.

Methods

Conceptual framework

The current research utilized a socio-ecological model to inform the analyses (Kaczynski et al., 2009; Sallis et al., 2006). This model suggests that health behaviors are influenced by a number of factors at multiple levels. These factors include individual and social as well as community and environmental factors. When applied to park-based physical activity, this model suggests that park-based physical activity will be influenced by personal characteristics such as demographics, family characteristics, and perceived environment (e.g., safety and availability). This model also predicts that behavior settings including neighborhood characteristics and the recreation environment will influence park-based physical activity.

Data source and population

This research used data from the 2007 California Health Interview Survey (CHIS), a random-digit dial telephone survey of more than 43,000 households designed to be representative of California's noninstitutionalized population. Data were analyzed in 2012–2013 with additional analyses conducted in 2015. CHIS 2007 is the most recent CHIS data set that included questions about physical activity in parks as well as the covariates used in the current analysis. One randomly selected adult (aged 18 years or older) was interviewed in each household. In households with adolescents ages 12 to 17 years, one adolescent was randomly selected and interviewed directly after obtaining parental permission and consent from the adolescent. Older adolescents were slightly

less likely to complete an interview (California Health Interview Survey, 2009d). However, the CHIS survey weights account for demographic and geographic characteristics to reduce potential nonresponse bias. In addition, previous research suggests that the CHIS sample is representative of the California population (Lee et al., 2009). This research also found no evidence of nonresponse bias in the CHIS sample. A total of 3,638 adolescents completed the survey, representing a completion rate of 44.1%. Interviews were conducted in English, Spanish, Chinese, Vietnamese, and Korean. Detailed information about California Health Interview Survey methodology is available elsewhere (California Health Interview Survey, 2009a, 2009b, 2009c, 2009d, 2009e).

Measures

The outcome measure of interest was based on adolescent responses to two questions: "In the past 30 days, did you go to a park, playground, or open space?" and "The last time you went to a park were you physically active while you were there?" The second question was only asked if adolescents responded yes to the first. Responses to these questions were used to create a variable with three levels: active during last park visit, not active during last park visit, no recent park visit. These levels are analyzed as distinct categories because it is possible for adolescents to make the decision to go to a park separately from the decision to be active at the park.

The following individual sociodemographic characteristics were included in these analyses: age, gender, race/ethnicity, and nativity. Family characteristics included parental education, parental nativity, and annual household income. Neighborhood characteristics included urbanicity, adolescent perception of the safety of his or her nearby park, adolescent perception of park availability near home, and neighborhood income and racial/ethnic composition.

Adolescents reported their age, gender, nativity (coded as US-born or foreign-born), and race/ethnicity (white, Latino, Asian, African American, American Indian, Pacific Islander, or mixed race). In addition, adolescents reported whether there was a park, playground, or open space within walking distance of home and how strongly they agreed that the park closest to home was safe during the day (strongly agree, agree, disagree, or strongly disagree).

The adult respondent reported household income, household address, parental educational attainment, and maternal and paternal nativity. Household income was examined as a percent of the federal poverty level (0–99%, 100–199%, 200–299%, and 300%, and above). Maternal and paternal nativity were coded as US-born or foreign-born. Parental educational attainment for the responding adult was coded as high school or less, some college, college graduate.

Household address was used to determine the census tract in which a family lived at the time of the survey. Data from the American Community Survey, 2005–2009, were linked to the CHIS data set by census tract to examine neighborhood income and neighborhood racial/ethnic composition. Census tracts in which 50% or more of the households were below 200% of the federal poverty level were considered lower income. Neighborhood racial/ethnic composition was examined as percent of the population in the census tract that was Hispanic or Latino (less than 25% versus 25% or more Hispanic or Latino). Using data obtained from CLARITAS, households were assigned to urbanicity levels (urban, suburban, rural) based on population density of the household's ZIP code and surrounding areas.

Analyses

Multinomial logistic regression analyses were used to examine the association of individual, family, and neighborhood characteristics with park-based physical activity, where being active during the last park visit and not being active during the last visit were each compared to not having a recent park visit. The model included age, gender, race/ethnicity, household income, urbanicity, respondent's nativity, maternal nativity, paternal nativity, responding parent's educational attainment, perceived park availability near home, perceived safety of nearby park, neighborhood income, and neighborhood racial/ethnic composition. Predictive margins were used to calculate adjusted percentages for variables that were significant predictors of park-based physical activity in the multinomial regression model (Graubard and Korn, 1999). Due to missing values for the neighborhood income variable, regression analyses included 3,636 adolescents. Data were analyzed with SAS and STATA. Analyses were weighted to be representative of the California population and adjusted for the complex survey design of the California Health Interview Survey. The University of California, Los Angeles (UCLA) Office for the Protection of Research Subjects certified this research exempt from review.

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