



Review Article

Observational Park-based physical activity studies: A systematic review of the literature



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ARTICLE INFO

Article history:

Received 13 January 2016
 Received in revised form 6 June 2016
 Accepted 12 June 2016
 Available online 14 June 2016

Keywords:

Exercise
 Physical activity
 Community
 Parks

ABSTRACT

This article reports the outcomes of a systematic review of observational park-based physical activity (PA) studies. Five electronic databases and the Active Living Research website were searched in July 2015 to identify relevant articles. Studies were included if they: a) reported observational data collected at outdoor park-based settings during free living conditions, b) reported results of a park audit, c) included PA as an outcome measure of the park audit, and d) were published after 1990 in English-language peer-review journals. Thirty-two articles, reporting outcomes of 26 unique studies, met inclusion criteria for review. Most studies ($n = 20$, 87%) had cross-sectional or non-interventional study designs, while 6 (23%) employed quasi-experimental designs. Studies were predominately conducted in the U.S. ($n = 19$, 76%). The median number of park users across studies was 4558 (Range = 815 to 76,632). Approximately half (51%) of all park users were female. Eighty-one percent of studies ($n = 21$) reported PA outcomes for individuals of all ages, while 4 studies (15%) reported PA outcomes for children only and 1 study (4%) for adults only. Moderate-to-vigorous physical activity (MVPA) of park users ranged from 31% to 85% (Median = 55.0%). Studies conducted in the U.S. reported a slightly higher median number of park-users engaging in MVPA than those outside the U.S. (60.5% vs. 52.8%). Fifteen studies examined gender differences in MVPA. Among these, 12 (87%) reported more males engaging in MVPA than females. Results of this review highlight the need for innovative strategies to promote MVPA among park users and to increase park use among children.

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Abbreviations: PA, Physical activity; MVPA, Moderate-to-vigorous physical activity; SOPARC, System for observing play and recreation in communities; SOPLAY, System for observing play and leisure activity in youth.

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1. Introduction

Physical activity (PA) is an established mechanism to prevent numerous health conditions, including cardiovascular disease, type 2 diabetes, overweight/obesity, some cancers, and psychological disorders (U.S. Department of Health and Human Services, 2010; Jakicic & Otto, 2005; U.S. Department of Health and Human Services, 2008). Despite these benefits, most individuals are insufficiently active. The World Health Organization estimates that only 23% of adults and 20% of children achieve recommended levels (World Health Organization, 2015a), making insufficient PA the fourth leading risk factor for global mortality causing an estimated 3.2 million deaths each year (World Health Organization, 2015b).

In an effort to combat the low PA levels across the world, public health professionals have become increasingly focused on how the built environment—broadly defined as the physical form of communities—influences the PA patterns of individuals in those communities (Brownson et al., 2009; Sallis & Glanz, 2006; Sallis et al., 2012; Sallis & Green, 2012). The built environment is comprised of a variety of features (i.e., buildings, landscape patterns, layouts of communities, transportation infrastructures, parks, and trails) (Centers for Disease Control and Prevention (CDC), 2015), all of which have the ability to influence PA engagement. Of particular interest, is the availability, design, and use of neighborhood parks to encourage PA. Parks are ideal settings to promote PA because they are composed of green spaces (i.e., trails, sports fields) and physical structures (i.e., playground and exercise equipment, sidewalks) specifically designed to promote PA (McKenzie et al., 2006). Community parks also encourage social interaction (Peters et al., 2010; McCormack et al., 2010) and can be accessed by community members at minimal-to-no cost. Moreover, in urban and inner-city settings, parks are often the only place for residents to engage in outdoor recreation and/or sporting activities.

A substantial number of park-based PA studies have been published in the past two decades. However, the majority of these examine individual cities and do not assess whether park-based PA differs according to population characteristics and geographical location. The purpose of this article is to systematically review observational park-based PA studies and summarize park-user characteristics and park-based PA across the U.S. and internationally. Other park related studies that examined the quantitative relationship between parks located near one's place of residence and PA were not the focus of this review. Knowledge of how neighborhood parks contribute to the PA patterns of communities is imperative to develop interventions and public health programs to increase park-based PA among adults and children.

2. Methods

2.1. Information sources and eligibility

The systematic review methodology used to identify and report outcomes of observational park-based PA studies was informed by the Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) Statement (Moher et al., 2009). Articles were included in the review if they: a) reported results of a systematic observational park-based assessment, b) included physical activity as an outcome measure, c) were published in English-language peer-review journals, and d) were published between 1990 and August 2015. We excluded studies that assessed park use during structured, sanctioned, or organized activity (i.e., school recess, physical education courses), as the purpose of the review was to examine park use under free-living

conditions. Five electronic databases were searched to identify relevant articles (see Fig. 1): PubMed, PsycINFO, CINAHL, Web of Science, and Scopus. In addition, we supplemented our electronic database search with a manual review of articles available on the Active Living Research (ALR) website (www.activelivingresearch.org).

2.2. Search strategy

The Boolean strategy was used to identify articles during electronic database search procedures. Specifically, we searched titles and abstracts of peer-reviewed articles using the following key term sequence: “park” OR “parks” OR “built environment” AND “physical activity” OR “exercise” AND “observational” OR “SOPARC” OR “SOPLAY”. We decided not to use MeSH terms because they are less often used outside of the biomedical field and some search terms like SOPARC have no corresponding MeSH terms. To identify relevant articles from the ALR website, we manually reviewed the titles and abstracts of all publications (n = 1275) available on the website. Search procedures were performed during July 2015.

2.3. Study selection

Articles retrieved during search procedures were exported to Endnote® electronic referencing software (EndNote X7, 2014). Once duplicates were removed, titles and abstracts of articles were assessed for eligibility by one member of the research team (RPJ). Articles appearing to meet inclusion criteria after title and abstract review received a full-text review. The full-text review was conducted by RPJ. Articles not clearly meeting inclusion criteria from initial full-text review were reviewed by the senior research team member (JEM) and a consensus was reached among the two researchers.

2.4. Data collection process

For all articles included in the review, we abstracted the following information: authors, year of publication, study purpose, study design, study population(s), number of parks assessed per study, geographical location of park(s) assessed, total number of days each site was assessed, total number of observations per site, total number of park users by site, characteristics of park users, and physical activity outcomes. Data abstraction was conducted by both members of the research team (RPJ, JEM), with any discrepancies discussed until a consensus was reached.

2.5. Methods of analysis/synthesis of results

First, we grouped studies according to study design (i.e. cross sectional, experimental, longitudinal, etc.). Second, we grouped studies of similar designs based on the age characteristics of the population examined (i.e., children only, adults only, or park users of all ages). Third, we summarized year of study publication, study purpose, study design, study population(s), number of parks assessed per study, geographical location of park(s), total number of days each site was assessed, total number of observations per site, total number of park users by site, characteristics of park users, and physical activity outcomes. Finally, we synthesized, compared, and contrasted findings across studies.

Due to the heterogeneity of how outcomes were reported across studies, several decisions were made on how to handle individual study data in order to synthesize outcomes. For studies reporting within study variation regarding the number of days each park was assessed and the total number of observations per park (n = 4 studies,

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