Active use of urban park facilities – Expectations versus reality

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ARTICLE INFO

ABSTRACT

Urban green spaces (UGS), and more specific a higher number of facilities in UGS, have been positively associated with physical activity (PA). However, more detailed studies of which facilities generate high levels of PA, for which type of users, are relevant as existing knowledge is scarce and inconclusive. Using the System for Observing Play and Recreation in Communities (SOPARC) we examined the PA levels during use of four different UGS and the use of 36 facilities. Semi structured qualitative interviews with the UGS architects were conducted to reveal the predetermined target groups of the facilities. Facilities that provide the opportunity for games and playing activities are more used for PA than facilities directed at individual training of strength and fitness. The opportunity for socializing and playing while being physically active seems important for many users. A variation in facilities arranged close to each other, as well as the design and quality of facilities, have an impact on use of facilities. Furthermore, males are more vigorously active than females when using facilities. Use of some facilities did not match the predetermined target groups and esthetics was mentioned as a key factor when designing facilities. Our results provide important knowledge to architects, planners and policy makers when aiming at designing activity-promoting facilities in UGS. Future studies need to further investigate the use of facilities among specific target groups, particularly females, and make this information more accessible to planners and architects.

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1. Introduction

Regular physical activity (PA) reduces the risk of non-communicable diseases such as coronary heart disease, hypertension, type 2 diabetes, depression, and breast and colon cancer (Haskell et al., 2007; Warburton et al., 2006; WHO, 2010). Furthermore, PA is a crucial factor of energy expenditure, and thus a key to weight management and prevention of obesity (Donnelly et al., 2009).

Research has shown that worldwide 31.3% of adults (age 15 years and over) are physically inactive (Hallal et al., 2012) and 9.4% of all premature deaths can be related to physical inactivity (Lee et al., 2012). The World Health Organization (WHO) has identified physical inactivity as the fourth-leading risk factor for global mortality (WHO, 2010), indicating that inactivity is of similar importance compared to the established risk factors such as smoking and obesity (Lee et al., 2012).

More than 1.3 million deaths could be prevented every year by increasing the world's population PA levels by 25% (Lee et al., 2012). However, the factors that correlate with PA are so diverse that in order to achieve a population change in PA levels it is crucial to identify and understand these variables.

In terms of health behavior, development of socio ecological models as framework for studying health behavior has been brought to attention by several researchers (e.g., Bauman et al., 2002; Sallis et al., 2006, 2008). The model developed by Sallis and colleagues (Sallis et al., 2006) highlights that PA is influenced by factors on multiple levels including individual, social, physical and political factors. In an extensive review by Bauman and colleagues (Bauman et al., 2012), a socio ecological model was used to analyze the literature that investigates the factors that are associated with PA. They found that individual factors such as age, gender, health status, self-efficacy and previous PA are associated with PA. Additionally, they found that several environmental factors such as urban design, transportation systems, and parks were predictors of PA. Recreation facilities, green areas and esthetics were the most consistent predictors (Bauman et al., 2012). However, for the past decade, research analyzing the factors that affect the use of urban green space (UGS) has shown an inconsistency in results, with many different factors found in different studies. Some of the factors include neighborhood characteristics (Van Dyck et al.,

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2013); distance to nearest UGS (Cohen et al., 2007; Kaczynski et al., 2008; Sallis and Kerr, 2006; Schipperijn et al., 2010a, 2013); size of UGS (Kaczynski et al., 2008; Schipperijn et al., 2010b) and the number of UGS close to home (Kaczynski et al., 2009). Research in terms of use of facilities specifically designed for health promotion in UGS is also limited and inconclusive. Bedimo-Rung and colleagues (Bedimo-Rung et al., 2005) suggested that the conditions and design of facilities influence park-users. Another study by Cohen and colleagues (Cohen et al., 2006) found that park facilities are associated with greater use for adolescents girls and a greater use of parks with more features was reported by Kaczynski and coauthors (Kaczynski et al., 2008, 2014a,b). Schipperijn and colleagues (Schipperijn et al., 2013) found that there was no relationship between PA and adding facilities specifically aimed at PA, though the total number of facilities did seem to influence how attractive an UGS was for PA. The lack of conclusive evidence suggests that more research is needed on the use of facilities in UGS and specific target groups for different facilities.

It is unclear if the available research results are available to and used by architects and decision makers during the process of planning new UGS facilities. These matters necessitate political involvement and changes in the way architects and planners work with new facilities. Environmental changes in society and development of UGS rely on policy changes and a political commitment (Kohl et al., 2012). Only a few of the mass media campaigns focusing on health behavior have managed to increase population PA level (Cavill and Bauman, 2004) which might indicate that more structural interventions that also use the environment to increase the level of PA are necessary (Foster et al., 2006; Hunter et al., 2015).

The city of Copenhagen, Denmark, is an interesting study area in terms of political involvement as a government reform in 2007 demanded that all Danish municipalities initiated health promotion projects (Aarestrup et al., 2007). That is, they attempted to encourage higher PA levels among citizens to enhance public health and reduce the risk of any diseases. In 2007, the Technical and Environmental Committee of the City of Copenhagen published a strategy with different environmental goals for the year 2015. One of the aims was to double the average number of visits per person to parks and natural areas between 2007 and 2015 (Miljøforvaltningen, 2007). In trying to achieve such a goal it is important that architects and planners are capable of using the available research results and methodological approaches for environmental interventions.

The objective of this study is to examine the use of four UGS in Copenhagen and in particular the use of facilities that promote PA. Furthermore, we want to analyze the differences between the target groups expected by architects and the observed user of different facilities. This lead to the following research questions: (1) Which facilities are used for PA? (2) Are some facilities used more than others? (3) Are the facilities used by the expected target groups?

2. Methods

2.1. Study Area, Urban Green Spaces and Facility Selection

The data in this study was collected in Copenhagen; the capital of Denmark. As of April 2013, the city of Copenhagen had a population of 720,023, an area of 169.6 km^2 and a population density of 4245 inhabitants/km^2. We chose four UGS located close to the inner city of Copenhagen; Fælledparken, Superkilen, Sifs and Krakas with no more than 2 km between each. Since 2009, these four UGS have all experienced renovations that changed usability, added facilities intended to promote PA, and improved the general urban design.

Urban green space (*UGS*) is in this article defined as parks, nature areas and other green spaces that are publicly owned and publicly accessible (Schipperijn et al., 2013).

Facility is defined as a specific component within a UGS that has the potential of promoting PA.

The selection of facilities in the four UGS was based on field observations, information from publicly available reports, and interviews with the responsible architects.

2.1.1. Fælledparken

Fælledparken is Copenhagen's most visited UGS with approximately 11 million visitors per year. The park is more than 100 years old and 58 ha in total; the area examined in this study is 3.64 ha. The main purpose of Fælledparken is to provide a location for sports and cultural events and to offer a recreational environment for the citizens of Copenhagen. In 2009 the municipality of Copenhagen received a donation of 152 million Danish crowns (roughly 21 million Euro) from the A. P. Moeller Foundation. The money was donated to renew and develop recreational areas and facilities in the park. The focus of the renovation process was "*from spectator to active participant*", which has led to a design with many facilities that provide the opportunity of being physically active, but also create space for observers.

2.1.2. Superkilen

Superkilen was inaugurated in June 2012. The UGS is 3 ha and was totally redesigned by the well-known Danish architecture firm BIG (Bjarke Ingels Group). The area previously consisted of a grass area with a bike lane and a parking lot. Now it is a park with color-coded areas that represent PA, recreation and play, as well as a bazaar and marketplace. The idea of Superkilen was to create a multi-cultural UGS with facilities comparable to the diversity of nationalities represented in the neighborhood, resulting in a park with facilities from 57 different countries.

2.1.3. Sifs and Krakas

Sifs and Krakas are two smaller new UGS of 0.24 ha and 0.21 ha, respectively. There is less than 400 m between the two areas and both UGS are a part of a plan to promote PA for the citizens living in the neighborhood. Both UGS were opened for use in October 2011.

2.2. Study design and data sources

In this study we collected data using two methods: interviews with architects and systematic observations of designated target areas.

2.2.1. Interviews

We conducted two different types of interviews; (1) short telephone interviews with all project managers that had been involved in the design process of each UGS and (2) semi structured qualitative interviews with the architects responsible for the selected facilities. Three architects were identified as the persons with most influence on the type of facilities that were selected for each UGS. One architect was responsible for Fælledparken, one for Superkilen, and one for Sifs and Krakas. An interview guide was developed for the semi structured qualitative interviews. The interview guide contained a list of questions and topics that were to be covered in each interview. For every facility, we asked the architects to describe the expected target group, purpose and the expected impact. During the interview, a table listing every facility was completed together with the architect. We asked questions about the architects' ability to use experts and available research when selecting specific facilities. The architects were also asked about how they