



Review

The impact of interventions to promote physical activity in urban green space: A systematic review and recommendations for future research



Ruth F. Hunter^{a, *}, Hayley Christian^b, Jenny Veitch^c, Thomas Astell-Burt^{d, e},
J.Aaron Hipp^f, Jasper Schipperijn^g

^a UKCRC Centre of Excellence for Public Health (NI)/Centre for Public Health, Queen's University Belfast, Northern Ireland, UK

^b Centre for the Built Environment and Health, School of Population Health, and Telethon Kids Institute, The University of Western Australia, Australia

^c Centre for Physical Activity and Nutrition Research, School of Exercise and Nutrition Sciences, Deakin University, Australia

^d School of Science and Health, University of Western Sydney, Australia

^e School of Geography and Geosciences, University of St Andrews, UK

^f Brown School and Prevention Research Center in St. Louis, Washington University in St. Louis, USA

^g Research Unit for Active Living, Department of Sports Science and Clinical Biomechanics, University of Southern Denmark, Denmark

ARTICLE INFO

Article history:

Available online 26 November 2014

Keywords:

Built environment
Physical activity
Behavior change
Systematic review
Interventions
Social environment
Public health

ABSTRACT

Evidence is mounting on the association between the built environment and physical activity (PA) with a call for intervention research. A broader approach which recognizes the role of supportive environments that can make healthy choices easier is required. A systematic review was undertaken to assess the effectiveness of interventions to encourage PA in urban green space. Five databases were searched independently by two reviewers using search terms relating to 'physical activity', 'urban green space' and 'intervention' in July 2014. Eligibility criteria included: (i) intervention to encourage PA in urban green space which involved either a physical change to the urban green space or a PA intervention to promote use of urban green space or a combination of both; and (ii) primary outcome of PA. Of the 2405 studies identified, 12 were included. There was some evidence (4/9 studies showed positive effect) to support built environment only interventions for encouraging use and increasing PA in urban green space. There was more promising evidence (3/3 studies showed positive effect) to support PA programs or PA programs combined with a physical change to the built environment, for increasing urban green space use and PA of users. Recommendations for future research include the need for longer term follow-up post-intervention, adequate control groups, sufficiently powered studies, and consideration of the social environment, which was identified as a significantly under-utilized resource in this area. Interventions that involve the use of PA programs combined with a physical change to the built environment are likely to have a positive effect on PA. Robust evaluations of such interventions are urgently required. The findings provide a platform to inform the design, implementation and evaluation of future urban green space and PA intervention research.

© 2014 Elsevier Ltd. All rights reserved.

1. Introduction

Prevalence of physical inactivity and its associated health conditions are rising, and the inexorable slide to a more inactive

lifestyle has worrying implications for future levels of obesity, morbidity and mortality (Lee et al., 2012). A broader approach which recognizes the role of supportive environments that can make healthy choices easier is required. However, physical activity (PA) is a complex behavior that is often discouraged in modern built and social environments (Khan et al., 2011). Considerable evidence is mounting on the association between PA and the built environment in which an individual lives (O Ferdinand et al., 2012). Accordingly, the potential of the built environment as a determinant of PA, and its ability to influence community and population

* Corresponding author. UKCRC Centre of Excellence for Public Health (NI)/Centre for Public Health, Queen's University Belfast, Institute of Clinical Science B, Royal Victoria Hospital, Grosvenor Road, Belfast, Northern Ireland, BT12 6BJ, UK.
E-mail address: ruth.hunter@qub.ac.uk (R.F. Hunter).

levels of PA is becoming more widely recognized (DoH, 2007; WHO, 2010).

In particular, urban green space (UGS) has an important contribution to make to public health with potential physical, psychological, social, economic and environmental benefits (Bedimo-Rung, 2005; Bowler et al., 2010; Lee and Maheswaran, 2010; Lachowycz and Jones, 2011). Urban green space is defined as all publicly owned and publicly accessible open space with a high degree of cover by vegetation, e.g., parks, woodlands, nature areas, and other green space within the city boundary area (Schipperijn et al., 2013). Cross-sectional evidence highlights the association between UGS and PA. The availability and accessibility of UGS, particularly across the socio-economic spectrum, offers the opportunity for recreation and active travel for little or no cost to the individual. Physical activity has been shown to have positive associations with proximity, access, size and quality of UGS (Giles-Corti et al., 2005; Mowen et al., 2007; Kaczynski et al., 2011). Attributes of UGS that might stimulate and encourage PA include walking/cycling paths, wooded areas, open spaces, water features, lighting, pleasant views, bike racks, parking lots, and playgrounds (Schipperijn et al., 2013). However, to date much of the research in this area has been observational and shows that many UGS are under-utilized (Floyd et al., 2008, 2011; Cohen et al., 2010; Kaczynski et al., 2011).

Interventions specifically targeting use of UGS may assist with increasing PA behavior change at the community and population level. Urban green spaces receive significant investment for modifications and programming, particularly from local authorities. Examples include improving access to UGS, improving walking/cycle paths, and playground/park facilities in UGS. Interventions to specifically promote and encourage use of UGS or specific features of UGS include awareness, marketing and promotional campaigns, and PA programs in UGS. There is a need to identify if such investments are effective in increasing use of UGS and PA of UGS users, and subsequently determine how to make best use of UGS for public health. As with other aspects of built environment research, there has been a call for evidence of the effectiveness of environmental interventions to initiate and help maintain PA behavior change. Therefore, the aim of this study was to undertake a systematic review to assess the effectiveness of interventions to promote PA in UGS, including the development of new UGS.

2. Methods

2.1. Search strategy

Five electronic databases (Medline, EMBASE, CINAHL, Sport DISCUS and PubMed) were searched for articles published up to July 2014, and reference lists of included studies were hand searched for further relevant papers. Keywords relating to 'physical activity', 'urban green space' and 'intervention' were searched (see Appendix I).

2.2. Eligibility criteria

Studies were included if they met the following criteria:

- (i) intervention to promote/encourage PA in UGS
- (ii) primary outcome measure of PA levels, including subjective and objective measures of overall PA, or walking and cycling specific measure, or recreation or active travel domain specific measure
- (iii) a control/comparator group
- (iv) English language
- (v) full-text available

UGS was defined as all publicly owned and publicly accessible open space with a high degree of cover by vegetation, e.g., parks, woodlands, nature areas, and other green space within the city boundary area (Schipperijn et al., 2013).

Physical activity interventions that involved the following were included:

- (i) a physical change to the built environment including environmental improvements or creation of new environmental PA opportunities (e.g., new footpaths, improved playgrounds);
- (ii) an intervention to specifically promote/encourage use of UGS or specific features of UGS (e.g., awareness campaigns, PA programs in UGS).
- (iii) a combination of physical change to the built environment and a specific awareness/promotion program to encourage PA in UGS.

2.3. Evidence synthesis

Studies were categorized according to the main approach of the intervention: 1) built environment only intervention; 2) PA promotion only intervention; 3) combination of built environment change and PA promotion intervention. Key characteristics and outcomes of the studies were extracted and tabulated including study design, country, target population, description of intervention and control/comparator group, outcome measures, duration of follow-up and summary of study findings. The review followed the PRISMA guidelines (Moher et al., 2009) and risk of bias was assessed using the Cochrane Risk of Bias tool (Higgins et al., 2011), performed independently by two reviewers. While intended for controlled trials, the majority of items are applicable to other study designs and allocate lower scores to studies employing study designs which introduce bias.

3. Results

Appendix II shows the results of the literature search. Briefly, 2405 studies were initially identified, 64 full-text articles screened, and 12 studies included in the review.

3.1. Study characteristics

Table 1 presents a summary of the included studies. Eleven of the studies were natural experiments with the majority using a quasi-experiment, controlled pre-post design ($n = 8$), and one difference-in-difference design (Branas et al., 2011). Only one study employed a RCT design (Cohen et al., 2013). Studies were mainly implemented in the US ($n = 9$), particularly in California ($n = 6$), and the other studies took place in Australia ($n = 3$). A number of studies were set in areas where the majority of the population were of low Socio-Economic Position (SEP) and of ethnic minority groups (Cohen et al., 2009a; Tester and Baker, 2009; Fitzhugh et al., 2010; Cohen et al., 2012; Veitch et al., 2012; Bohn-Goldhaum et al., 2013; Cohen et al., 2014), which are typical of inner-city areas. Given the heterogeneity in target populations, interventions and outcome measures it was not appropriate to pool results in a meta-analysis.

Appendix III presents the results of the risk of bias assessment described by study. Only one study had a low risk of bias (Cohen et al., 2013), which employed an RCT design, with five studies assessed as having a high risk of bias (Merom et al., 2003; Cohen et al., 2009a, 2009b; West and Shores, 2011; Bohn-Goldhaum et al., 2013) and six with an unclear risk of bias (Tester and Baker, 2009; Fitzhugh et al., 2010; Branas et al., 2011; Cohen et al., 2012,

Download English Version:

<https://daneshyari.com/en/article/7333743>

Download Persian Version:

<https://daneshyari.com/article/7333743>

[Daneshyari.com](https://daneshyari.com)