



Associations between urban greenspace and health-related quality of life in children

Deborah S. McCracken^a, Deonie A. Allen^b, Alan J. Gow^{a,*}

^a Department of Psychology, School of Life Sciences, Heriot-Watt University, Edinburgh EH14 4AS, UK

^b School of Energy, Geoscience, Infrastructure and Society, Heriot-Watt University, Edinburgh EH14 4AS, UK

ARTICLE INFO

Available online 3 February 2016

Keywords:

Greenspace
Children
Self-report
Kid-KINDL
GIS spatial analysis
Health-related quality of life

ABSTRACT

With research to suggest that urban greenspace use can affect the health and wellbeing of adults, it is important to investigate this association in children. Compared with factors such as physical activity, research considering greenspace and its association with the health and wellbeing of children from urban areas is relatively rare.

This study examined the health-related quality of life of 276 children residing in the city of Edinburgh in relation to quantity and use of greenspace. As much of the existing research has employed parental reports of children's health, the current study assessed health-related quality of life via self-report, measured using the Kid-KINDL questionnaire (Ravens-Sieberer & Bullinger, 1998). Spatial analysis of greenspace quantity and typology was undertaken using mapping software, ArcGIS (Esri, 2011).

In regression analysis, higher greenspace use and having fewer siblings were significantly associated with better health-related quality of life. Further analysis revealed that these variables were also associated with the 'friends' sub-scale score of the Kid-KINDL. Higher greenspace use was positively associated with 'self-esteem' sub-scale scores. However, the quantity of residential greenspace was not associated with the health-related quality of life of children.

This study suggests that increased use of greenspace in urban areas might have a small but positive impact on child health-related quality of life, though future longitudinal and intervention studies are required to confirm these causal assumptions.

© 2016 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

The health and wellbeing of urban residents have become a major research focus (Nutsford et al., 2013). An increasing body of epidemiological research suggests that access to, and use of, greenspace within urban areas can positively impact many health and wellbeing issues (Mitchell, 2013; Carter and Horwitz, 2014). This study examined associations between the quantity and the use of greenspace and health-related quality of life in young children.

Previous research has suggested that viewing greenspace can provide restorative effects on mental and physical health. 'Stress Recovery Theory' (Ulrich, 1984; Ulrich et al., 1991) suggests that viewing natural scenes can reduce symptoms of stress and anxiety, contrary to typical urban scenes which can lead to decreased attention and happiness (Ulrich and Addoms, 1981; Van Den Berg et al., 2010). While Stress Recovery Theory relates specifically to adults, the potential health and wellbeing benefits derived by viewing natural scenes encompassed by the theory may be valid in both adults and children. In observational studies, children in rural areas surrounded by more greenspace were less susceptible to the psychological effects of everyday stressors and

reported higher overall wellbeing than those in city areas (Wells and Evans, 2003). In research with adults, the use of greenspace for physical activity was associated with reductions in many chronic diseases (e.g. cardiovascular disease) (Wolch et al., 2014) and improved mental health (Maas et al., 2009). Furthermore, adults who believed local greenspace to be of practical use reported better general health (Carter and Horwitz, 2014). Positive associations have also been found between the quality and proximity of greenspace to people's homes and their use for physical activity (Nutsford et al., 2013; Crawford et al., 2008; Pikora et al., 2003).

It has been suggested that greenspace may moderate the negative effects of deprivation on health outcomes. For example, while reduced exposure to greenspace and residing in deprived urban areas were associated with all-cause and circulatory disease mortality, the association was not observed for individuals who lived in deprived areas with higher levels of greenspace (Mitchell and Popham, 2008). Using geographical information systems (GIS) analysis, Nutsford et al. (2013) reported that both higher levels of greenspace and smaller distances from the home to usable greenspace were associated with fewer depression and anxiety symptoms in adults from deprived areas. Researchers have therefore suggested that the health of residents from urban areas could benefit from greenspace which is of close proximity to their homes (Ward-Thompson et al., 2012).

* Corresponding author.

E-mail address: a.j.gow@hw.ac.uk (A.J. Gow).

Fewer studies have considered how greenspace might benefit the health and wellbeing of children (Flouri et al., 2014; Spencer and Blades, 2006). It is essential to have an understanding of this relationship as lifestyle choices adopted at a young age may impact early outcomes and future habits and associated outcomes throughout the life course (Power and Elliott, 2006). Strong associations have been found between childhood use of greenspace and this behavior in adulthood (Ward-Thompson et al., 2008).

Greenspace research with children has predominantly focused on physical activity (Flouri et al., 2014; Wheeler et al., 2010). Despite evidence that children prefer an outdoor setting (Wells and Evans, 2003; Evans, 2006), they are increasingly spending their free time indoors (Louv, 2010). Childhood obesity is rising (Lobstein, 2014; Ng et al., 2014), though children with greater access to greenspace are more active and less obese than children without such access (Wolch et al., 2014). Children in Scotland living at increasing distances from greenspace watch more television and have more psychological and general health problems than children living closer to greenspace, when measured through parental reports (Aggio et al., 2015).

Associations have been reported between limited time spent outdoors and behavioral problems in children (Louv, 2010). Markevych et al. (2014) found that the further children lived from greenspace, the more behavioral problems and symptoms of ADHD they displayed, and the more relationships with friends suffered. This is consistent with the findings of Flouri et al. (2014) which suggested both increased access to, and use of, greenspace in children aged 3–5 were related to fewer symptoms of hyperactivity, and fewer problems with friends.

The current study examined associations between quantity and use of greenspace and health-related quality of life of children in Edinburgh. As much of the existing research has employed parental reports of children's health and greenspace use, the current study was therefore conducted as a "proof of concept" by assessing these factors via child self-report, while greenspace quantity was assessed objectively using ArcGIS (Esri, 2011).

Methodology

Design

The study was a cross-sectional survey, designed to explore associations between greenspace (use and quantity) and health-related quality of life. For 95% power to detect a small effect size (.1) at $p < 0.05$ in a multiple regression with 7 predictors, a sample size of at least 226 was required.

The main outcome was total self-reported health-related quality of life assessed by the Kid-KINDL questionnaire (Ravens-Sieberer and Bullinger, 1998). The two main predictor variables were self-reported use of greenspace and the percentage of greenspace within the residential area, measured using ArcGIS version 10.0 (Esri, 2011).

Participants

Participants were recruited from primary schools within Edinburgh, UK. Eighty-eight potential schools were split into 10 groups based on their Scottish Index of Multiple Deprivation (SIMD) ranking (Scottish Index of Multiple Deprivation, 2012) and were contacted for participation through random assignment within each group. When a school declined participation, a further random selection from that group occurred. A total of 37 schools were contacted, and eight agreed to take part. At participating schools, all children aged 8–11 years were given consent forms for their parent/guardian to complete. From an estimated upper maximum of 900 potential participants, a total of 287 completed the questionnaire. Nine participants were excluded due to a high proportion of missing data, and two were removed for ticking multiple responses on more than one occasion. Therefore, the number

of participants ranged from 254 to 276 because of minor instances of missing data, detailed below.

Procedure

Data collection occurred between November and December 2014. Participants were given a questionnaire to complete regarding experiences during the previous week. The participants completed the questionnaire individually, though the researcher (DM) went through each question in turn, allowing time for explanation.

Ethical considerations

Ethical approval was obtained from Heriot-Watt University and the Children and Families Department of Edinburgh City Council. Only children who received permission from their parent/guardian participated, after being briefed on the nature of the study and their right to withdraw at any time.

Materials

Health-related quality of life

Health-related quality of life was measured using the Kid-KINDL questionnaire (Ravens-Sieberer and Bullinger, 1998), a developmentally tailored questionnaire for children aged 7–13 years. Health and wellbeing across six different domains were assessed by 24 statements, each answered on a five-point scale from never (1) to all of the time (5). A total score was calculated by adding the sub-scale scores transformed to a scale of 100 as per the instructions. Each sub-scale and the number of participants are displayed in Table 1.

Use of urban greenspace

Use of greenspace over the previous week was assessed by self-report. Based on the 'Planning Advice Note 65: Planning and Open Space' (Planning Advice Note 65, 2008) created by the Scottish Government, outdoor areas relevant to children were separated into seven different categories. These were: public park/garden; own garden; allotment garden; playpark; outdoor sports facilities; woodland areas; the street or other hard surfaces for people. Frequency of use for each was reported using a five-point scale from never (0) to every day (5), and transformed to a score out of 100. Participants were also asked how often they had exercised outside in the previous week.

Residential greenspace

Greenspace data were obtained from the Central Scotland Green Network. Participants provided their home postcode and a map detailing each location was created using Google Maps. Visual analysis of the mapped home locations illustrated spatial clustering of participants; 46 spatial groups of participants were identified. The spatial grouping of participants allowed for latent class analysis (Dymnicki and Henry, 2011; Carvalho et al., 2009). Consistent with previous research (Markevych et al., 2014; Kyttä et al., 2012), the distance considered acceptable for greenspace accessibility was 500 m. Thus, the greenspace available within a 500 m radius from the cluster group centre was calculated using ArcGIS (Esri, 2011). Where postcodes were spatially clustered, all participants attributed to a specific cluster fell within 50 m of the centroid. Where participants were remotely located (outside of a 50 m greenspace centroid), greenspace was calculated for their individual postcode.

A breakdown of greenspace (per m²) types within each area was extracted. Greenspace was classified as all vegetated open space areas. Water areas (e.g. canals, rivers and ponds) were removed as they were not relevant to this study. The percentages of each greenspace

Download English Version:

<https://daneshyari.com/en/article/4202349>

Download Persian Version:

<https://daneshyari.com/article/4202349>

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