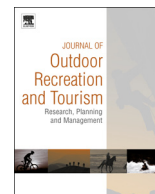




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Physical health in green spaces: Visitors' perceptions and activities in protected areas around Barcelona

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ABSTRACT

This paper supports the crucial role that suburban parks and green spaces play as settings that provide resources for physical activity. A study undertaken in four protected areas in the metropolitan region of Barcelona found that the majority of the surveyed park visitors ($n = 508$) reported that physical health was an important motivation for visiting the parks (89.9%). It also reported a perceived improvement in their physical health as a consequence of that visit (88.0%). The most physically-active recreation activities were practiced more by younger people, nearby residents, and visitors reporting high levels of perceived physical health, motivation for visiting, and impact of that visit. Interestingly, green space visitors showed a higher perceived health than the general population of the region. These results, potentially useful for park management strategies, suggest the need for a better acknowledgement of parks and green spaces as promoters of healthy behaviors.

Management implications: Typically the promotion of health and well-being (and more specifically, physical health) is not a crucial element of green spaces. However, the presented findings show that:

- Managers of parks and protected areas should include this aspect into their planning.
- Respective infrastructure should be implemented or enhanced.
- An active promotion of physical health in parks and protected areas may also enhance the acceptance of these sites.

1. Background

Physical activity is important for the maintenance and improvement of good health (Bedimo-Rung, Mowen, & Cohen, 2005; Blair & Brodney, 1999; Hardman & Stensel, 2003; Rosenberger, Bergerson, & Kline, 2009; Scully, Kremer, Meade, Graham, & Dudgeon, 1998). Many public health agencies and organizations encourage increased participation in physical activity, especially among adult populations, in order to improve health and counteract the increasing sedentary behavior of populations in many countries (Rosenberger et al., 2009). Said sedentary behavior leads to increasing levels of overweight, obesity, and chronic diseases and disorders, including coronary heart disease, type 2 diabetes, and various cancers (Haskell et al., 2007; Rosenberger et al., 2009). An important location for the physical activity can be parks, natural open spaces, and green spaces (Godbey & Mowen, 2010; Henderson, 2006; Kaczynski & Henderson, 2008; Pretty, Peacock, Sellens, & Griffin, 2005). A growing number of studies have shown a wide range of benefits for people's health from being in contact with nature, not only physical health and well-being benefits, but also psychological, spiritual, social, and environmental well-being benefits

(Abraham, Sommerhalder, & Abel, 2010; Godbey, 2009; Hartig, Mitchell, de Vries, & Frumkin, 2014; Health Council of the Netherlands, 2004; Kuo, 2010; Lemieux et al., 2012; Maller, Henderson-Wilson, Pryor, Prosser, & Moore, 2008; Morris, 2003; Nieuwenhuijsen, Khreis, Triguero-Mas, Gascon, & Dadvand, 2017; Nilsson, Baines, & Konijnendijk, 2007; Romagosa, Eagles, & Lemieux, 2015; Sandifer, Sutton-Grier, & Ward, 2015; Shanahan et al., 2016; Sustainable Development Commission, 2008; Townsend & Weerasuriya, 2010).

Physical activities in green spaces can increase individuals' levels of physical activity, more than that occurring at home (Barton, Hine, & Pretty, 2009; Bird, 2004; Giles-Corti et al., 2005; Godbey, 2009; Mitchell, 2013; Oftedal & Schneider, 2013; Pretty et al., 2007; Ryan et al., 2010; Thomson Coon et al., 2011). Moreover, "parks and other infrastructure, including non-motorized trail corridors, bikeways, and sidewalks for example, provide important opportunities to meet recommended daily levels of physical activity through outdoor recreation" (Rosenberger et al., 2009).

Many studies have found that physical activity levels increase where participants have convenient and close contact to green space. In other words, the closer people live to an open space health resource, the more

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likely they are to use that resource for physical activity (Bird, 2004; Coombes, Jones, & Hillsdon, 2010; Godbey & Mowen, 2010; Godbey, 2009; Kaczynski & Henderson, 2007, 2008; Mytton, Townsend, Rutter, & Foster, 2012; Sugiyama, Francis, Middleton, Owen, & Giles-Corti, 2010; Toftager et al., 2011). However, there are many factors that can influence the physical activity levels in green spaces; apart from the spatial accessibility of resources, one could mention safety, supply, quality and attractiveness of recreational spaces, the park management and policies (promoting or discouraging physical activity), the availability of leisure time, and the nature of the community (Bedimo-Rung et al., 2005; Diez Roux et al., 2007; Godbey, 2009). Regarding attractiveness, if we take into account the fact that parks and green spaces are usually established in aesthetically attractive settings (and suburban or periurban parks more than urban parks), aesthetics is an element that can promote visits to those places for physical health motivation, alongside psychological and social health and well-being motivations. For their part, the study undertaken by Carrus et al. (2015) identified higher levels of self-reported well-being benefits from high biodiversity periurban parks visitors than those who visited low biodiversity urban parks.

Knowing the perceptions of park visitors in relation to their health is a key aspect of the study of the impact that parks and green spaces have on people's physical health. In fact, perception is an essential part of how people experience and use natural areas (Relph, 1976), and the personal benefits obtained from visiting are the key element in societal acceptance and the approval of parks and protected areas and their management (Bushell & Eagles, 2007). Since the 1970s vast literature has been produced, referring to the motivations and benefits of visiting green spaces under the general framework of outdoor recreation (Manning, 2011). Within this context, the recreation experience preference (REP), related to the study of motivations for leisure (Manfredo, Driver, & Tarrant, 1996), as well as an Outcomes Focused Management (OFM) approach to park management (Weber & Anderson, 2010) have been developed. However, this type of studies has not paid particular attention to the health dimension of leisure in green spaces. Only recently some studies that try to explicitly analyze the park visitors' perceptions of their health and well-being can be found. As reference studies, those developed in Canada by Lemieux et al. (2012, 2016), and Finland by Kaikkonen et al. (2015) could be mentioned. They studied different dimensions of health and well-being, such as physical, psychological, social, or environmental, among others (especially in the Canadian case), finding that park visits were positively affecting visitors' physical and mental health, as reported by the visitors themselves. Another study developed in Finland analyzed the relationships between exposure to urban green spaces, physical activity, and self-rated health (Pietilä et al., 2015). Most of these studies make their analyses looking at the behavior differences among different visitor groups (age, gender, education background, etc.). Therefore, by following and implementing a similar methodology from the former examples, our research seeks to overcome the lack of studies in this field, especially in a Southern Europe geographical context, and fill this gap, contributing towards furthering the existing knowledge on this topic in countries such as Spain, Portugal, Italy, Greece, Turkey and others. In this paper, though, we are only going to pay attention to the physical health dimension.

2. Study purpose

Taking into account the theory and the background previously described, we conducted research to gain a better understanding of green space visitors' physical health perceptions, as well as the physical health motivation and impact or benefit derived from visiting those places. The results of this study could be useful for potential park management strategies. In the context of this study, green spaces are understood as natural areas, not as urban vegetated spaces, following the differentiation proposed by Taylor and Hochuli (2017). The research used a case study design to characterize the perceived physical

health benefits of visitors in a selection of protected areas in the metropolitan region of Barcelona (Catalonia, Spain). The research utilized a broad perspective on the health and well-being motivations and benefits of the visitors to the selected protected areas, including not only the physical health dimension but other dimensions of health and well-being too (i.e., psychological, social, environmental, spiritual, and financial dimensions). This current paper, though, focuses on the specific physical health dimension and has the following three main research questions:

- 1) What importance do park visitors give to physical health motivation and physical health impact in relation to their visit to the park?
- 2) What is the association between visitors' characteristics and the perceptions of motivation and impact?
- 3) What is the association between the different activities undertaken by visitors while visiting the park and visitors' characteristics and perceptions of motivation and impact?

3. Methods

Survey sampling took place in four protected areas in the metropolitan region of Barcelona: Collserola Natural Park, Montseny Natural Park, Sant Llorenç del Munt Natural Park, and Garraf Park (Fig. 1). All of them are included in the European Union's Natura 2000 network of protected areas. These parks were selected by consensus with the Barcelona province protected areas managers because they were considered representative of the diversity of parks that make up the network of protected areas managed by the Barcelona provincial government. All of them have relatively high numbers of annual visitors (with the extraordinary case of Collserola, which has an enormous number of annual visitors, since it is located around the city of Barcelona itself), and each of them represents a different type of ecosystem and landscape (i.e. Collserola and Garraf are low mountain areas, and Montseny and Sant Llorenç del Munt are middle mountain areas, each with different geological and botanical features) (Table 1). Furthermore, they provide a diversity of infrastructures and services allowing a range of activities to be included in the survey. Taking all of this into account, it was considered that the selection of the four study sites could provide representative results for the whole network of parks under the management of the Barcelona provincial government, made up of twelve parks.

The study used a questionnaire completed by park visitors in September and October of 2015. This was considered by park managers to be an optimum period of the year, since during summer and winter periods the visitation numbers in those parks decrease. The places where the survey was conducted were also agreed with the protected areas managers, including for each park several representative places from the visitation point of view (e.g., at main entrances, parking areas, trails, and interpretive displays). In order to guarantee the maximum representation of the sample the days of the week were also agreed upon, concentrating the survey works more on weekends than on week days, in a total of ten days of surveying per park. The survey, carried out by two people on-site, generally took place between 11 a.m. and 6 p.m. with the objective of easily finding those visitors who were finishing their visit to the park. A convenience sampling technique was employed, whereby potential respondents over 18 years of age were intercepted on a next available basis; meaning the next adult when the researcher was ready to continue surveying. All participants were asked to fill in the questionnaire only if they were finishing their visit to the park at that moment. They were also informed of the voluntary nature of the survey, and that they would remain anonymous. The questionnaire was completed onsite and results were later merged and formatted for descriptive statistical and correlation analysis (Spearman) using IBM SPSS Statistics version 21.

Demographic questions included age, gender, place of residence, highest level of education completed, and number of visits made to any

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