



How can public open spaces contribute to physical activity promotion?

Como os espaços públicos abertos podem contribuir para a promoção da atividade física?

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ABSTRACT

Public open spaces (POSs) are means to ensure one's right to recreation and health. The objective of this essay is to present reflections and evidence on how these spaces contribute to promoting physical activity (PA). Understanding how to access (proximity/distance), quantity and diversity, and the surrounding and internal conditions of places (quality, structure, aesthetics, safety) can affect the use of POSs is imperative for public management actions. Thinking of POS use beyond PA by recognizing its social, economic, and cultural benefits can be fundamental to reduce inequalities regarding access to these places. POS-related actions and demands are intersectoral, multiprofessional, and interdisciplinary, thus requiring political, academic, and community involvement and commitment for PA promotion.

Keywords: Motor activity; Recreation; Green spaces; Recreational parks; Sustainable development goals; Environment design.

RESUMO

Espaços públicos abertos (EPA) são equipamentos que promovem o direito à recreação e à saúde. O objetivo deste ensaio é apresentar reflexões e evidências sobre como esses espaços contribuem para a promoção da atividade física (AF). Compreender como o acesso (proximidade/distância), a quantidade e diversidade, as condições do entorno e internas dos locais (qualidade, estrutura, estética, segurança), podem afetar o uso dos EPA é fundamental para ações da gestão pública. Pensar o uso do EPA para além da prática de AF, reconhecendo seus benefícios sociais, econômicos e culturais pode ser fundamental para diminuir as iniquidades de acesso a esses locais. Ações e demandas relacionadas aos EPA são intersetoriais, multiprofissionais e interdisciplinares, necessitando com isso envolvimento e comprometimento político, acadêmico e comunitário, a fim de promover AF.

Palavras-chave: Atividade motora; Recreação; Áreas verdes; Parques recreativos; Objetivos de desenvolvimento sustentável; Planejamento ambiental.

Introduction

About 55% of the world's population lives in urban areas, and this figure is estimated to reach 68% by 2050. In Brazil, 85% of the population resides in cities, and this proportion is high compared to international standards². With the growth of urbanization, the discussion about how environmental attributes can affect the health and quality of life of the population becomes increasingly important. This topic is relevant for planners, managers and researchers to be able to rethink healthy and sustainable public spaces.

The New Urban Agenda published at the United Nations Conference on Housing and Sustainable Urban Development and the 2030 Agenda³ prioritize the construction and revitalization of healthy, equitable, safe, and sustainable spaces [Sustainable Development Goals (SDG) 11 - sustainable cities and communities]³. In Brazil, the City Statute establishes the guarantee of one's right to sustainable cities that allow the right to land, housing, sanitation, urban infrastructure, displacement, public services, work and leisure⁴. It also ensures that the social function of the city is at the center of the discussion on urban policies to provide people with an adequate place for human development and citizenship⁴.

In this context, public open spaces (POSs) play an important role in the implementation of these agendas⁵. Parks, squares, green areas, and beaches are places for people to socialize and are related to recreation⁵. Physical activity (PA) promotion through provision of POSs has shown to be promising, especially due to the potential to mitigate the inequalities of access to places for this practice. However, it is still necessary to move forward in the discussion about the role of these spaces in contributing to creating more opportunities and programs intended to promote PA, and recognizing that these places benefit people's health in ways beyond engagement in PA. In order to maximize the use of these places, it is necessary to conceptualize them so that it is possible to identify how their characteristics could reduce inequalities as to gender, age, and income, among others. The 2018-2023 Global Physical Activity Plan, of the World Health Organization (WHO) suggests that building and revitalizing active environments is one of the key objectives for reducing physical inactivity⁶. However, only 42% of countries have PA programs in POSs, and there are still no data on Public Policies at the national level to encourage the use of POSs in the sense of promoting PA in the investigated countries⁷.

In this context, the objective of this essay is to present reflections and evidence on how public open spaces contribute to promoting physical activity.

Conceptualizing Public Open Spaces

For the interpretation and understanding of the meaning and relevance that POSs have for PA and public health, it is necessary to know the meaning of some terms. Conceptually, "space" is understood as the superficial extension or limited dimension of an area. Whereas "public" is an adjective relative to the population, collectivity or something that belongs to all people. Therefore, "public space" is a place that is available to the population⁵. This is different from "private space", which can be managed or closed according to the owner's interest. In this sense, public space is owned by the state and taken over and used by the population.

In the Geography field, the expression "public space" is the generic denomination for open urban areas. While in the Architecture and Urban Planning field, "public space" is any free and open urban space to be used by the population⁵. In the urban environment and public health field, POSs are places to which the population has free access, regardless of size, design, structure or quality, and mainly intended for leisure or recreation, whether active or passive⁵. In the Brazilian scenario, some examples of POSs are parks, squares, groves, green areas, bike paths, bike lanes, sidewalks, Health Center Program stations, open streets, sand strips by the sea, among many other contextual places inherent to municipalities of small, medium or large size.

The unification of a POS definition would possibly not be adequate if done through a mere association involving the concepts used by different fields. Although there are different and important interpretations, in the context of the urban environment, it is necessary to consider the importance these places have in promoting PA and health at the population level⁵.

Around the 2000s, there was a pronounced increase in the publishing of evidence related to the "POSs and health" topic, more specifically in the PA and public health fields. The accumulation of knowledge produced in several countries provided the making of theoretical and conceptual models to better understand the relationship between the availability, characteristics, and use of places, as well as their impact on PA (mainly leisure-time PA) and quality of life. In 2015, renowned researchers published an important study on "Public open spaces, physical activity, urban design, and public

health: concepts, methods, and research agenda”⁵. This text is used to support several arguments in this theoretical essay. However, the authors relied on studies carried out in high-income countries, such as the United States and Australia. Thus, it is prudent to be careful when extrapolating information to the vast Brazilian context.

Benefits of public open spaces

The WHO recommends the construction, revitalization, and maintenance of favorable environments for PA as one of the means to contain the physical inactivity pandemic^{6,7}. Nonetheless, these spaces may offer other co-benefits that go beyond PA^{5,8}. POSs can provide benefits for the physical, mental, and social health of the population, in addition to a positive economic impact, for environmental sustainability and public safety⁸.

The presence of and proximity to POSs, such as parks and green areas, can promote the population’s physical and mental health, especially through engagement in contemplative or physical activities in these places. People who live close to these spaces have a lower prevalence of chronic diseases, and proximity to green areas can benefit mental health in different age groups^{5,8}. POSs bring about greater social cohesion and interaction, which favors PA in these places by means of a greater perception of social support and safety. Thus, holding scheduled community events at these locations (sports competitions, commemorative events, PA classes) can provide important social benefits for the population^{5,8}.

Another little-investigated co-benefit in Brazil is the economic impact of POSs. The number of sites is positively related to PA, better physical and mental health, which can reduce public health costs. It can also increase the commercial value of homes and land close to the POSs, in addition to opening businesses in the surroundings that can stimulate the economy in the region^{5,8}. Additionally, public spaces with green areas can mitigate the effects of global warming, lowering the temperature in the region and making them more pleasant for PA. Other examples related to environmental sustainability are bike paths/lanes, which can encourage the use of bicycles for commuting, thus reducing CO₂ emissions and noise from motor vehicles. Moreover, the implementation of strategies to reduce road speeds can lower the number of accidents and encourage walking and cycling around POSs^{5,8}.

Public policies promoting POSs are aligned with the

SDGs. Thus, there is a window of opportunity to ensure suitable locations as part of a multisectoral agenda to promote more active and sustainable environments.

Factors that may affect use and engagement in physical activities in public open spaces

Knowing the factors that affect the use of POSs can help in planning environmental and political changes aimed at promoting PA at these locations. The literature highlights some factors, namely: access (proximity/distance); quantity and diversity; surrounding and internal conditions of the site (size, quality, facilities, safety)⁵.

Access (proximity/distance)

Proximity to POSs is one of the main factors that can influence their use. Evidence has shown a positive association between proximity to POSs and greater use of sites, as well as an association with higher levels of leisure-time PA. This is a relevant characteristic for urban planning, since people tend to frequent POSs in their neighborhoods and those close to their homes, without the need to use other “faster” means of transportations, such as car, motorcycle, bus or bicycle⁵.

Proximity can be assessed subjectively or objectively. The subjective measure is based on the perception of the proximity between the residence and the location (e.g., very close, close, far, very far), the estimated distance (e.g., <200 meters, 200-500 meters, >500 meters), or the time spent if the person walked (<5 min, 5-10 min, 10-15 min, >15 min). The Neighborhood Environment Walkability Scale is one of the valid instruments to measure the perception of proximity; it has been translated into Portuguese and is widely used in research⁹.

Objective assessment consists of establishing the distance that would be covered by the street network, from the residence to the places, with measures obtained by the Geographic Information System¹⁰. Measuring the proximity or distance to POSs through the street network allows for the best estimate, since it takes into account inadequate routes for one to actively reach the location⁵. The literature suggests that neighborhood connectivity is best estimated when considering the network for pedestrians and cyclists, rather than the street network⁵.

Quantity and diversity

Most studies explore the distance from people’s homes

to the nearest POS. However, this characteristic does not capture the quantity and diversity of types, sizes or facilities available in these places. For instance, some studies have not observed an association between proximity to sites, use, and higher PA levels. Basically, the absence of an association can be attributed to the fact that people do not always use the spaces close to their homes. A person may live in front of a bike path/lane, but does not use it because they prefer to walk 10 minutes to the nearest park in order to contemplate nature or take their children for a bicycle ride, for instance. The size, facilities, and attractiveness of POSs may be more important than how close they are. Therefore, it is important to evaluate the attributes concerning the quantity and diversity of locations, since these characteristics can affect accessibility and one's choice of location. Measures can be subjective (as when respondents are asked if, for them, there are POSs available in their neighborhood and how many) or objective (e.g., count of locations per audit)^{5,9,10}.

Surrounding conditions

If the POSs are close to people's homes, perhaps the choice regarding the means for reaching the location is by walking or cycling. For this reason, the characteristics of the surrounding streets can affect how often and the way in which the sites are used. Thus, crime, traffic, aesthetics, presence, and quality of sidewalks or cycle paths need to be considered, planned, and evaluated. The built environment around a park, for instance, may not only moderate the influence of the site's quality but also has its own influence on POS access for PA⁵.

Internal conditions (quality, structure, aesthetics and safety)

Designed or not, the areas or facilities for PA within a POS may include sports fields and courts, walking tracks, bicycle paths, playgrounds, among others. Still, it is necessary to consider the perception and meaning attributed to the place. For example, size, quality, aesthetics, and facilities are oftentimes not limited to specific areas within the site and can be assessed by considering the quality of their internal conditions.

Some POSs have a wide variety of facilities for different purposes. For example, the presence and quality of sports courts and physical exercise equipment can be used for a more intense PA; while the presence of trees that provide shade can be more attractive for contemplative activities, reading or yoga⁵.

POS goers may be more interested in using a place where the facilities are of a better quality. Thus, the conditions and maintenance of facilities and equipment are probably the most important factors for POS use. Moreover, other factors that affect the condition of a place are the characteristics of incivilities that can inhibit its use, such as dirt, weeds or tall grass, scattered garbage, graffiti, homeless people, and drug users, among others. The set of positive features of the environment, such as a well-kept lawn or garden, are perceived as safer places and can encourage the use of POSs. Dark, dirty, graffitied places or those with broken equipment can attract idle people or drug users, contributing to the perception of insecurity among visitors, especially among people who are more vulnerable to harassment or crime (such as women, unaccompanied people, or the elderly)⁵.

Knowing and exploring the role of each POS facility or condition, and its subsequent combinations, use, and influence on PA can provide landscape planners or architects with a wealth of useful information on how to prioritize resources at new or revitalized sites. The implementation of actions or policies will allow POSs to be configured in a way that makes people perceive safety, comfort, and well-being when using them⁵.

Promoting public open spaces for physical activity

Although POSs have several benefits, how to make these places more favorable for PA is little explored. Understanding the possibility of changing the environment can be an important step towards implementing effective interventions. Evidence shows that POS interventions can promote PA, but most of the studies were carried out in high-income countries¹¹, even though, in recent years, there has been an increase in the number of studies in Latin America presenting important evidence on the relationship between POSs, PA, and health¹¹.

There is a need to consider local characteristics (income, safety and social norms) for a proper interpretation of research results, since these characteristics can influence the effect and magnitude of the results of interventions. For instance, a promising intervention is Bogotá's Ciclovía Program (Colombia), in which, on Sundays and bank holidays, some main avenues are closed to motor vehicles and open to the community as a POS option for leisure and PA¹¹. In a similar action carried out in São Paulo, SP, the Presidente João

Goulart (Minhocão) viaduct, located in the central region of the city and which has high traffic, is closed to the circulation of vehicles during the night and on weekends and open for the population to use for PA and leisure¹². In Pelotas, Rio Grande do Sul, the Leisure Streets Program advocates opening some streets on weekends for recreational and cultural activities and exhibitions¹³.

An example of intervention with POS provision was a study of the expansion of stations and activities covered by the Health Center Program in Pernambuco, which showed an increase in the PA level of the population after three years¹⁴. It is important to emphasize that this effect was greater on women, which reinforces the assumption that this can be an important strategy to mitigate the inequalities of access to PA facilities and programs when it comes to gender. In Florianópolis, Santa Catarina, the construction of a walking track and PA facilities on the waterfront avenue increased leisure walking time among adults by 15 minutes per week. The effect was greater (30 min/week) for people living up to 500 meters from the site¹⁵.

This evidence suggests that different POS interventions are promising to provide PA opportunities for the population, resulting in more active people, as well as healthier and more sustainable cities. These “open streets” programs or actions enable the use of POSs for various purposes and require less investment compared to building sites.

Directions for actions within the scope of research and services

Although there has been a significant increase in evidence concerning the benefits of public open spaces on public health, some conceptual, methodological, and practical gaps need to be addressed in order to advance research. The suggestions below can guide studies and practical environmental interventions in the Brazilian context.

- Introduce the POS theme on the PA promotion agenda in Brazilian cities;
- Stimulate the implementation of local and national policies that establish norms and priorities for the construction, revitalization, and maintenance of POSs;
- Implement physical activity programs in POSs for children, adolescents, adults, and the elderly, with an emphasis on physically inactive population subgroups;

- Create a national network for permanent assessment of the impact that POSs have on the health and sustainability of cities;
- Implement temporary programs and actions in neighborhoods with low access to POSs, such as recreational streets, events, or bike lanes;
- Conduct studies that describe inequalities in POS distribution in different regions of Brazil;
- Broaden longitudinal studies and natural experiments in order to assess the effect of implementing or revitalizing POSs on health and sustainability;
- Broaden the understanding of POS definitions in different fields of knowledge;
- Assess specific physical activities in POSs according to sex, age group, income, and skin color, among other characteristics;
- Understand how different population subgroups use POSs;
- Analyze street network and geolocation information to explore proximity measures;
- Explore the appropriate (threshold) distance to facilitate access to and use of sites;
- Evaluate the attributes of physical, social, and natural environment surrounding the sites;
- Broaden the understanding of how the attributes of these sites are associated with their use for individual PA.

Further considerations

The 2018–2030 Global Physical Activity Plan suggests that the construction, revitalization, and maintenance of POSs is a necessary and viable strategy in low- and middle-income countries, which have high inequalities regarding access to PA, to reach the goal of reducing physical inactivity by 15%. POSs are believed to have a great impact on health promotion and should be part of an intersectoral agenda on which managers, technicians from different fields, and researchers can articulate plans that optimize and enhance the use of these spaces to make society, people, environments, and systems more active.

Conflict of interest

The authors declare that there is no conflict of interest.

Authors' contribution

Rech CR, participated in the manuscript design, writing, and critical review; Pazin J, participated in the manuscript design, writing, and critical review; Rodrigues EQ, participated in the

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