THE IMPACT OF COVID-19 ON THE PERNAMBUCANO AGRESTE URBAN PARK

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ABSTRACT

Objective: Analyze the modifications made to Urban Parks such as Parque Euclides Dourado, located in the municipality of Garanhuns/PE, in order to provide their safe use during periods of disease contagion such as the covid-19 pandemic

Theoretical Reference: Urban Parks present themselves as viable alternatives for carrying out physical activity and restoring mental fatigue. With the Covid-19 pandemic, usage dynamics were modified to mitigate contagion.

Method: To carry out field research, the methodology of counting and recording urban life from the book How to Study Public life by Jan Gehl and Birgitte Svarre (2013) was used. The methodology consists of counting; preparing a study of pedestrian flows and routes; mapping and photographic recording, carried out through field research.

Results: It was found that studies capable of measuring the effectiveness of contagion mitigation are still scarce and therefore it is necessary to develop specific technologies and methodologies to advance the scientific field in this area of study.

Implications of the research: The results of this work are of great relevance for the sustainable development not only of Euclides Dourado Park, but of all Urban Parks, as they are capable of providing physical activity, relaxation and biophilia.

Originality/value: Understanding the changes in the dynamics of public facilities, such as urban parks, can make cities more prepared to face similar health crises in the future.

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Keywords: Coronavirus, Urban Planning, Urban Parks, Biophilia.

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RESUMO

Objetivo: Analisar as modificações feitas em Parques Urbanos como o Parque Euclides Dourado, localizado no município de Garanhuns/PE, a fim de proporcionar seu uso com segurança em períodos de contágio de doenças como na pandemia da covid-19.

Referencial Teórico: Os Parques Urbanos se apresentam como alternativas viáveis para a realização de atividades físicas e para restauração da fadiga mental. Com a pandemia da covid-19, as dinâmicas de uso foram modificadas para mitigação de contágio.

Método: Para a elaboração da pesquisa de campo, utiliza-se a metodologia de contagem e registro da vida urbana do livro How to Study Public Life de Jan Gehl e Birgitte Svarre (2013). A metodologia consiste na contagem; elaboração de estudos de fluxos e percursos de pedestres; mapeamento e registro fotográfico, realizados através de pesquisa de campo.

Resultados: Constatou-se que estudos capazes de mensurar a eficácia da mitigação de contágio ainda são escassos e por isso é necessário o desenvolvimento de tecnologias e metodologias específicas para o avanço no campo científico nessa área de estudo.

Implicações da pesquisa: Os resultados deste trabalho são de grande relevância para o desenvolvimento sustentável não só apenas do Parque Euclides Dourado, mas sim de todos os Parques Urbanos, já que são capazes de proporcionar a prática de atividade física, relaxamento e biofilia.

Originalidade/valor: A compreensão das modificações das dinâmicas de equipamentos públicos, como os parques urbanos, pode fazer com que se as cidades estejam mais preparadas para o enfrentamento de crises sanitárias semelhantes, no futuro.

Palavras-chave: Coronavírus, Planejamento Urbano, Parques Urbanos, Biofilia.

1 INTRODUCTION

Since the emergence of SARS-CoV-2, the virus responsible for the Covid-19 pandemic, humanity has faced a global health crisis. After the appearance of the coronavirus (as it became popularly known) in China, the virus spread worldwide. As a consequence, the World Health Organization (WHO) declared a public health emergency of international concern on January 30, 2020 and a pandemic on March 11, 2020 (Allam & Jones, 2020).

Furthermore, during the pandemic from the covid-19 social isolation was proposed to avoid the dissemination of the illness and this measure made the population Brazilian passed the have reduced contact time with nature, in addition to difficulties for carrying out activities...
physical. Contact with the natural environment and continuous physical exercise are important for human health and well-being, which is why there is a recommendation from the World Health Organization to perform 75 to 300 minutes of physical activity weekly, depending on the individual's age group and health conditions (Beck et al., 2020).

There is a consensus that physical activity has strong relevance for human health because active muscles produce chemical substances responsible for improving immune functioning, reducing infections and reducing inflammation. And Covid-19, like other cardiorespiratory infections, has the ability to damage the respiratory system. Therefore, physical activity is a powerful preventive and therapeutic intervention to avoid diseases such as diabetes and hypertension, and is essential even in pandemic times. In addition to significantly reducing the risk of viral transmissions and anxiety levels (Sallis et al., 2020).

In countries with continental dimensions and large populations such as Brazil, the adoption of stricter social distancing measures is a determining factor in minimizing impacts on health services, as restricting population mobility contributes to delaying the peak of the pandemic and prevents transmission to other locations (Joly & Queiroz, 2020).

Urban parks have the capacity to alleviate the harm caused by atmospheric pollution and are responsible for stimulating relaxation and pleasure. In this way, parks can bring quality of life to the population through contact with the quality natural environment and are important for physical activity and leisure, generating benefits, such as reducing sedentary lifestyle and daily stress (Allam & Jones, 2020).

In Brazil, the emergence of new and unknown viruses occurs much more in association with the continuous acceleration of the destruction of biomes. With the reduction, fragmentation and loss of habitats, man's contact with new viruses is constantly increasing. Countries like Brazil, with vast fauna, serious social vulnerability and high rates of environmental degradation, have a high probability of new pathogens migrating to human hosts from wild species (Joly & Queiroz, 2020).

The great revolutions in Urban Planning are related to the proliferation of diseases and the discussion of how the reorganization of the city could avoid contagion through the adoption of sanitary measures such as basic sanitation and the need to establish setbacks to ventilate the space (Graciano & Merli, 2021).

Since the origin of Covid-19 cases and due proof of the need for social isolation, the first measures adopted by governments were the closure of commercial establishments and public spaces in order to make it impossible for the population to circulate. Prohibitions like
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this did not prevent the use of parks and other leisure areas distributed throughout the world, mainly due to the urban population's need for these areas of refuge and contact with nature (Allam & Jones, 2020).

During the Covid-19 pandemic, several actions were proposed to prevent the spread of the disease, such as social isolation, recommending that people stay at home, as well as distancing and using masks to protect the airways. All these measures made the Brazilian population have difficulties in practicing physical activity. Therefore, it is necessary to continue practicing physical activity even during pandemics, but when carried out outside the home, measures must be observed so that this practice can be considered safe, such as social distancing, hygiene and the use of a mask, especially in times of proximity to other people and sharing equipment. It is necessary for public spaces to adapt to the new reality and provide the possibility of carrying out physical activity in an environment where contagion is mitigated (Beck et al., 2020).

Several studies relate the presence of vegetation in public spaces as a stimulus for health-inducing behaviors, such as walking and strengthening individuals to deal with future tensions. Parks are increasingly viewed as essential urban infrastructure that can provide diverse ecosystem functions, services and benefits. Indeed, the green area is now increasingly seen as fundamental to mitigating the impacts of climate change (including urban heat islands, flooding) and as a refuge for biodiversity (Ferreira et al., 2020).

The need to conceive urban design strategies in partnership with health organizations and municipal management institutions is evident, so that the implementation applied in the context of pandemics or epidemics can be effectively integrated into Environmental Urban Planning and, also, in situations of incidents to contain pandemics such as Covid-19 (Allam & Jones, 2020).

2 MATERIALS AND METHODS

2.1 Location of the study area

Located in the municipality of Garanhuns/PE, the Euclides Dourado park (Figure 1), also known as Parque dos Eucaliptos, is the largest public green area in the city, with an area of 92,731.40 m² and approximately 344 m in length and an altitude of 887 m, located in the Heliópolis neighborhood (Soares, 2015; Chaves, 2017).

Figure 1
Location of the study area.

Source: Authors (2023).

According to the criteria of the National Nature Conservation Unit System, SNUC (2000), which adopts specific nomenclatures to designate the typology of areas occupied by parks, the Euclides Dourado park is classified as: sustainable use unit.

Parque Euclides Dourado has a main entrance with a guardhouse and another, secondary, which is not always open. At the main entrance, the central path lined with interlocking gray blocks leads pedestrians into the park so that access to other facilities is possible: playground; food hall; sports courts; gym and bodybuilding equipment; chess and checkers tables; bathrooms; planetary; library; administration; bandstand; society football court; skate park and jogging track.

The Eucalyptus Forest was created in 1921 as a planting area for timber extraction). It was officially opened on September 21, 1925 as Parque Municipal dos Eucaliptos (Souza, 2020). The Euclides Dourado Municipal Park was converted into a municipal park and zoo during the administration of Euclides Dourado, in the second half of the 1920s, which positions it as the fifth oldest park in Brazil (Ferreira et al., 2013).
2.2 METHODOLOGICAL PROCEDURES

Using an experimental method, the present study consists of exploratory research, as it carries out a study to familiarize the researcher with the object being investigated, the Euclides Dourado Park (Garanhuns/PE) (Freitas & Prodanov, 2013).

Exploratory research allows the choice of techniques that can be put into practice by the researcher, along with the choice of study stages that require greater attention. This type of research seeks proximity to the reality of the object studied. It is possible, through exploratory research, to obtain explanations about phenomena and discoveries of new behaviors, so that it is possible to formulate new questions or hypotheses (Freitas & Prodanov, 2013).

To carry out field research, the methodology of counting and recording urban life from the book *How I'm Study Public life* by Jan Gehl and Birgitte Svarre (2013). The methodology consists of counting; preparation of a study of pedestrian flows and routes; mapping and photographic recording, carried out through field research. The count was prepared through an *on-site visit* to observe the behavior of pedestrians in the Park, followed by marking, by recording the 'point' symbol, on a map. This makes it possible to register on a previously prepared map, for later counting of users in the Euclides Dourado Park's spaces. The recording of these points may vary in color in order to delimit specific characteristics such as age group (Gehl & Svarre, 2013).

The study of flows and routes aims to analyze people's behavior and the trend of paths taken on foot, in order to record the movement of pedestrians in public space, using lines drawn on a previously prepared map. Just like counting, the lines drawn can vary in color in order to characterize users (Gehl & Svarre, 2013).

The flows were recorded during 03/14/2021, 07/24/2021 and 09/07/2021 (Figure 47). Different dates were chosen in terms of climatic season on the calendar as well as a national holiday (September 7th), as we sought to compare whether the dynamics of the Park could be affected in different climatic and social situations.
3 RESULTS AND DISCUSSION

3.1 THE IMPACT OF COVID-19 ON EUCLIDES DOURADO PARK

During 2020, Parque Euclides Dourado was closed due to the Covid-19 pandemic and was only reopened in 2021 with social distancing criteria and some equipment and areas closed. In 2021, Parque Euclides Dourado started to operate with reduced days and hours: Monday to Friday, from 6am to 5pm, with visitors being required to wear a mask. It is worth noting that the park made adaptations, with staff checking the temperature of visitors and offering 70% alcohol (Figure 2).

Figure 2
Temperature check.

Source: Authors (2023).

With the temperature check, we sought to identify individuals who had a fever, as this is one of the symptoms of Covid-19, thus carrying out a screening based on body temperature, not allowing the entry of people with this symptom. Despite being a control measure, measuring body temperature is not completely effective for detecting infected people, as these people may not have a fever or the disease is in its initial phase (Beniet al., 2021).

As educational and preventive measures, notices were installed at the entrance about the mandatory use of masks inside the Park, in addition to the free distribution of alcohol gel. Sinks were also installed at strategic points in the park so that users could wash their hands (Figure 3).
Studies carried out on the use of masks by the population showed that there is a significant reduction in the transmissibility of COVID-19, even if less effective masks are used, such as those made of fabric. If combined with other measures, such as social distancing and hygiene measures, they can contribute to the spread of the disease and its impact on the health system. It is essential to expand the production of guidelines, booklets, videos and technical documents that guide and raise awareness among the population about the correct use of masks (Girardi et al., 2021).

Masks are essential measures during pandemics of diseases that pose a greater risk of airborne transmission, as is frequent hand hygiene to prevent transmission through contact with eyes, nose and mouth. It is worth highlighting the importance of educational campaigns on site so that park visitors can put these measures into practice as recommended by health bodies.

After analyzing the results of these surveys, it is possible to conclude that it is necessary to increase the number of trash bins to avoid crowding when discarding objects or food and that more sinks need to be installed. It is also noticeable that the route of the jogging track needs to be redesigned, as pedestrians at different stages of the jogging track circuit meet and athletes get too close to the sidewalk of Av. Simoa Gomes, precisely in a section where there is a bus stop. This poses a risk of contagion to public transport users waiting for buses and sprinters.
Isolation measures play a prominent role in combating the pandemic, however, the adoption of these actions significantly reduced access to physical activity and greater exposure to sedentary behavior, especially during the peak of the pandemic. Despite robust literature on the benefits of practicing physical activity, especially for the cardiometabolic and immune systems, the Brazilian population, during the pandemic period, spent less and less time on physical activity. As social isolation measures were relaxed, public parks were reopened, however it is important to adopt actions that maximize the use of the park in a safe way (Guimarães et al., 2022).

As a preventive measure, equipment and sectors of the park with a higher probability of virus transmission due to the need for manual contact were closed. Examples of these places are: gym equipment, access to the bandstand and playground (Figure 4), which remained closed until July 2021.

**Figure 4**

*Prohibition of closed gym equipment (a), access to the bandstand (b), Playground (c)*

![Figure 4](image)

Source: Authors (2023).

In January 2021, with the start of vaccination against Covid-19 in Garanhuns, the city hall installed tents to serve as one of the vaccination hubs (Figures 5) in the Municipality. Davis (2022) explains that the growth of medical activities associated with testing, vaccination and isolation of patients undergoing treatment for Covid-19 has led to the birth of new demountable typologies in cities, including mass vaccination centers, drive-through testing sites and field hospitals.
These vaccination hubs played a fundamental role in the vaccination campaign against Covid-19 in the municipality of Garanhuns-PE, as these locations have a vast, open-air area with easy access to serve the population.

3.2 STUDIES OF PATHS, FLOWS AND COUNTING

The concept of sustainable cities is linked to the way their inhabitants move, which is what allows pedestrians, cyclists and drivers to interact well and comfortably on the roads. (Lima, 2022). It must also be considered that among the three classes, pedestrians are a priority, followed by vehicles being accommodated safely. (Marques & Batistela, 2016). As cities grow, the number of individual and motorized means of transport on the roads also increases, disenfranchising non-motorized and therefore more sustainable means of transport.

Over the years, measures to encourage the use of bicycles, public transport and walking have been created in order to encourage the population to adopt more sustainable modes of transportation and a healthier lifestyle. (Mamagnin, 2009) However, with the Covid-19 pandemic, this flow of people needed to be controlled, and measures so that people can continue to have this contact with nature in a safe way needed to be created.

To control social distancing, many cities have implemented quick actions to organize the flow of pedestrians in urban spaces. These are small-scale actions, under an experimental, gradual and low-cost logic that allow safe access to these places and which aim to achieve positive and long-term urban transformations. Given this, studies of people
flows and ways to optimize public spaces are of great relevance (Government of Buenos Aires, 2020).

Aiming to carry out a study of flows and counting in the Euclides Dourado park, a survey was carried out on March 14, 2021, July 24, 2021 and September 7, 2021, between 7am and 10am. Data analysis revealed the importance of a design intervention for the redesign of the jogging track, as well as the need for new proposals for permanent passage spaces, since according to the analysis of pedestrian flows (Figure 6), which occur Internally in the park, most of the flow happens through the central entrance axis of the Park, as well as through the jogging track and access to sports equipment.

**Figure 6**

*Internal flows of Euclides Dourado Park (7am to 10am).*

Furthermore, regarding the recording of user flows at Parque Euclides Dourado, from 7am to 10am, it was noticeable that children concentrated on the playground and sports equipment and did not use the running track. Teenagers also used sports and gym equipment and are the majority at the skate park and sand volleyball court.

Teenagers used the jogging track with less intensity when compared to adult users. *It was also possible to observe a predominance of elderly people on the jogging track, especially in the early hours of the morning. Some even exercise around the Park while it is still closed.*
and upon realizing that the Park has opened for visitors, they complement their daily exercise through the jogging track from Euclides Dourado Park.

The aging of the population is considered a very relevant demographic phenomenon in recent decades, people in this age group are considered in the risk classification in the face of the pandemic, therefore measures that promote social distancing and encourage the practice of physical exercise are important, in this way the study of flow in these environments is of great relevance (Romero et al., 2021; Lima, 2022).

It was possible to observe a greater number of people using space and exercising during the holiday compared to other days. On 07/24/2021 (winter), few people used the benches to stay as they were wet from the rain.

On the dates March 12, 2023, July 20, 2021 and September 7, 2021, data were also collected regarding the flow of the park. According to field research, the flow map from 5 pm to 7 pm (Figure 7) in quantitative terms is apparently equivalent to that from 7 am to 10 am. It is noticeable, however, that children are a minority at night from 8 pm to 10 pm (Figure 8) and that equipment further away from the entrance is used less at night.

In view of this, it is necessary to develop guidelines with the aim of supporting appropriate protocols for adapting the use of urban spaces, in a safe way, rethinking their adjustments, as this may influence the frequency of use of parks during the pandemic period. It is worth mentioning that public parks in Garanhuns were closed during a period of the pandemic and used less frequently after being reopened (Paiva et al., 2022)

Figure 7

*Internal flows of Euclides Dourado Park (5pm to 7pm).*

Source: Authors (2023).
Figure 8

*Internal flows of Euclides Dourado Park (8pm to 10pm).*

Source: Authors (2023).

In the movement flow maps, it was noticed that during the day the areas with the greatest activity and movement are located in important points of the square (outdoor gym, jogging track, tables and stretching equipment), the places with the lowest flow of movement are the football field, playground and skate park, while during the afternoon the busiest areas are located in the jogging track, outdoor gym, playground, tables, gym equipment and skate park, and the football field remains with low flow, as the multi-sports courts were in restricted use due to the covid-19 pandemic.

4 FINAL CONSIDERATIONS

The covid-19 pandemic called into question and highlighted the importance of green areas and public spaces, in contrast to the isolation that global society had to undergo, which was considered the only “vaccine” available to prevent the contamination and proliferation of illness. It is known that parks can bring quality of life to the population, through contact with the quality natural environment and are important for physical activity and leisure, generating benefits, such as, for example, reducing sedentary lifestyle and daily stress. In view of this, the research problem arises: what are appropriate spatial adaptations to allow the use of urban parks safely and how could this be done?
Challenges such as the Covid-19 pandemic require new investigative methods from the contemporary city. Parks, squares, gardens, public and private spaces will be remodeled in the same way that behavioral habits will be modified.

It was observed that adults are the age group that most uses the jogging track from 5pm to 7pm and from 8pm to 10pm. And that the municipal guards take a circular route, in order to monitor the empty areas with intensified turns around the central agency axis (where there is a greater flow of people). The guard is more mobile at night, however, the presence of municipal guards entering the jogging track was not recorded at any time. during this field research.

It is observed that in the morning the users found in greater numbers in the park spaces are adults and elderly people, while in the afternoon the users found are children, young people, adults and elderly people. It was observed that adults and elderly people use the park at the same intensity during the morning and afternoon, while children were not registered during the morning on weekdays in the park, and young people were only seen in the afternoon.

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However, just as there are innovative studies capable of reformulating the design of urban parks in the context of the proliferation of diseases, studies capable of measuring the effectiveness of contagion mitigation are still scarce and therefore it is necessary to develop specific technologies and methodologies to that.

Furthermore, the Covid-19 pandemic indirectly highlighted unequal access to public goods, such as the absence of urban parks in peripheral sectors of cities. This deprives part of the population of the possibility of physical exercise and contact with nature, which are essential elements in times of social isolation such as the coronavirus pandemic. The existence of quality residential neighborhoods is important as it facilitates a healthy, safe and social life by providing services within acceptable walking distances or as minimal travel by vehicle. And a good way to improve the urban quality of a poor neighborhood is certainly the inclusion of green areas with leisure and physical activity.
equipment. Health researchers point out that it is important to carry out daily physical activity and contact with nature, therefore, living close to green areas that allow sports, such as Parque Euclides Dourado, is, without a shadow of a doubt, a privilege.

It is urgent to carry out concrete Urban Planning actions that promote infrastructure in public spaces, in order to implement parks, squares and green areas (especially in socially deprived areas) to prevent the poorest populations from being the most vulnerable, in pandemic times, because there are no places close to home with contact with nature and the possibility of exercising.

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