



Public open spaces during the COVID-19 Pandemic:

perceptions regarding usage, behaviors, and advancements in urban policies

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Authors' notes'

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Abstract

Objective: To identify the perception of individuals who frequent public open spaces regarding social distancing, the use of public spaces, and the investment of public authorities in these spaces during the pandemic period.

Methodology: Six public open spaces were selected from two medium-sized cities in the interior of São Paulo, Araraquara and São Carlos. The public spaces were chosen based on criteria of multiple uses, territorial distribution and income. To achieve the objectives, the Perception Questionnaire method was employed. Twenty questionnaires were administered in each space, totaling 120 respondents per city, and 240 questionnaires were conducted for the entire research.

Originality/Relevance: The work aimed to fill a gap in knowledge, relating to the understanding of processes carried out in public spaces during the pandemic, from the perspective of the users of these spaces and also from the standpoint of public administration, fostering discussions on new principles and planning and management tools for these spaces.

Results: The results indicated an increase in the attendance of public open spaces and their appreciation by the population during the period of greater flexibility in the sanitary protocols imposed by the pandemic. There was also a perception of a decrease in care and more effective public actions. The study suggests the creation of programs and socio-cultural initiatives to enhance community engagement and a sense of belonging.

Social contributions/for management: This study aimed to deepen knowledge and provide evidence to support the formulation of guidelines, protocols, and policies for public open spaces during and after the pandemic, in conjunction with public health and urban planning issues.

Keywords: public open spaces, COVID-19 Pandemic, urban planning, public management, sustainability





Espaços livres públicos na Pandemia de COVID-19: percepção sobre usos, comportamentos e avanços nas políticas urbanas

Resumo

Objetivo: Identificar a percepção das pessoas frequentadoras dos espaços livres públicos acerca do distanciamento social, do uso dos espaços públicos e quanto ao investimento do poder público nesses espaços no período pandêmico.

Metodologia: Foram selecionados 6 espaços livres públicos de duas cidades médias do interior paulista, Araraquara e São Carlos. Os espaços públicos foram escolhidos por critérios de usos múltiplos, distribuição territorial e renda. Para alcance dos objetivos, utilizou-se o método Questionário de Percepção. Foram aplicados 20 questionários em cada espaço, perfazendo 120 respondentes por cidade, totalizando 240 questionários para a pesquisa.

Originalidade/Relevância: O trabalho procurou suprir uma lacuna do conhecimento, relativa à compreensão de processos efetivados nos espaços públicos durante a pandemia, pelos usuários desses espaços, e também, do ponto de vista da administração pública, para que se discutam novos princípios e instrumentos de planejamento e gestão para esses espaços.

Resultados: Os resultados indicaram um aumento da frequência dos espaços livres públicos e da sua valorização pela população no período de maior flexibilização dos protocolos sanitários impostos pela pandemia. Houve, também, a percepção sobre a redução do cuidado e de ações públicas mais efetivas. Sugere-se a criação de programas e ações socioculturais para ampliação da permanência e do sentido de pertencimento comunitário.

Contribuições sociais/ para a gestão: Este estudo visou aprofundar o conhecimento e fornecer evidências para subsidiar a formulação de diretrizes, protocolos e de políticas para os espaços livres públicos durante e após a pandemia, em interface com as questões de saúde pública e de planejamento urbano.





Palavras-chave: espaços livres públicos, Pandemia COVID-19, planejamento urbano, gestão pública, sustentabilidade

Espacios libres públicos en la Pandemia de COVID-19: percepción sobre usos, comportamientos y avances en las políticas urbanas

Resumen

Objetivo: Identificar la percepción de las personas que frecuentan los espacios libres públicos acerca del distanciamiento social, el uso de los espacios públicos y en cuanto a la inversión del poder público en esos espacios en el período pandémico.

Metodología: Se seleccionaron seis espacios libres públicos en dos ciudades medianas del interior de São Paulo, Araraquara y São Carlos. Los espacios públicos fueron elegidos según criterios de usos múltiples, distribución territorial y renta. Para alcanzar los objetivos, se empleó el método del Cuestionario de Percepción. Se han aplicado 20 cuestionarios en cada espacio, sumando 120 encuestados por ciudad y totalizando 240 cuestionarios para la investigación.

Originalidad/Relevancia: Este trabajo buscó cubrir un vacío de conocimiento relacionado con la comprensión de los procesos llevados a cabo en los espacios públicos durante la pandemia, desde la perspectiva de los usuarios de estos espacios y también desde el punto de vista de la administración pública, con la intención es debatir nuevos principios e instrumentos de planificación y gestión para estos espacios.

Resultados: Los resultados indicaron un aumento de la frecuentación de espacios libres públicos y de su valorización por la población en el período de mayor flexibilización de los protocolos sanitarios impuestos por la pandemia. También hubo percepción de una disminución en el cuidado y en las acciones públicas más efectivas. Se sugiere la creación de programas y acciones socioculturales para ampliar la permanencia y el sentido de pertenencia comunitaria.

Contribuciones sociales/para la gestión: Este estudio tuvo como objetivo profundizar el conocimiento y proporcionar evidencia para apoyar la formulación de directrices, protocolos y





políticas para los espacios libres públicos durante y después de la pandemia, en interfaz con las cuestiones de salud pública y de planificación urbana.

Palabras-clave: espacios libres públicos, Pandemia COVID-19, planificación urbana, gestión pública, sostenibilidad

Introduction

Research and practices concerning public open spaces in cities have grown significantly in importance within the realms of planning and public health, particularly in addressing sustainability, climate change, and in the context of the COVID-19 pandemic (Klemm et al., 2017; Reckien et al., 2018; Steele et al., 2021).

Several urban challenges have arisen due to the public health situation following the outbreak of the COVID-19 pandemic, which had its peak in 2020 and 2021. Amidst the uncertainties faced, one aspect highlighted in published studies after the return to face-to-face activities was the importance of people utilizing public open spaces.

Open spaces are typically defined as any areas devoid of buildings. These spaces may or may not be vegetated (Queiroga & Benfatti, 2007), and can be classified based on their category (squares, parks, gardens, streets, sidewalks, bike paths, hills, woods, forests, beaches, etc.) (Magnoli, 2006), or according to their typology (public, private, or potentially collective).

Public open spaces serve multiple functions and offer numerous benefits to society. They create thermally comfortable environments and aid in mitigating the heat island effect, thereby enhancing cities' resilience to climate change (Doick & Hutchings, 2013; Yu et al., 2017; Momm et al., 2020). Additionally, they contribute to reducing air pollution (Kumar et al., 2019). In their correlation with urban water, open spaces can contribute to decrease surface runoff of rainwater and support flood risk management (Battemarco et al., 2022). The increase in vegetation, infrastructure, and parks in cities also significantly impacts the health and well-being





of residents (Navarrete-Hernandez & Laffan, 2019). In terms of public health, they play a role in reducing obesity, psychological illnesses, and the risk of heart attacks (Saldiva, 2018).

According to Gehl (2013), squares and parks play a pivotal role in making cities more vibrant, human, sustainable, and healthy.

In the context of the COVID-19 pandemic, the benefits to people's health and well-being from using open spaces have been enhanced. Research indicates that individuals alleviate the stress of isolation and enhance their sense of comfort by engaging in physical and visual interaction with vegetated landscapes, utilizing them for recreational, sporting, and contemplative activities (Ximenes & Maglio, 2020; Jato-Espino et al., 2022).

Amidst the COVID-19 pandemic, public facilities and open spaces rose to prominence and became essential in several aspects. They provided well-being and enhanced quality of life for residents enduring months of confinement, or also by offering increased safety against virus transmission (Maceres & Peres, 2022).

A survey conducted in the city of São Paulo revealed that 90.5% of the 1956 respondents had felt a lack of green spaces during the period of enforced social distancing, with squares being identified as their most frequented locations after this period (Ximenes et al., 2020b). This feeling and perception among users of open spaces have not been limited to Brazil alone but have been observed worldwide.

Ungolini et al. (2020; 2021) conducted interviews with individuals across various countries, underscoring the significance of open green spaces during the pandemic for physical exercise, relaxation, and nature appreciation. Bristowe and Heckert (2023) conducted a review of 50 studies spanning from 2020 to 2021, analyzing behavior patterns, forms, and frequency of open space usage, as well as planning guidelines. The majority of these studies reported an uptick in space utilization following the pandemic lockdown period, driven by motivations such as organizing leisure time, pursuing physical and mental well-being, and the will to appreciate nature more. Stevens and Tavares (2020) emphasized the necessity for new activities and





functions in public spaces post-COVID-19, advocating for complex and systemic approaches to address these needs.

All of these studies have underscored the significance and function of public spaces in urban areas, concurrently propelling discussions regarding the necessity to reassess and establish new policies, guidelines, and regulations for their utilization. Such measures aim to prevent and mitigate potential new outbreaks and to foster the health and quality of life of urban residents. These changes have the potential to leave a permanent legacy on the functioning of cities (Bonduki, 2021).

During the pandemic, some Brazilian cities have initiated infrastructural transformations in public spaces. Notably, plans for urban parks have been set in motion in cities like Campinas (SP – State of São Paulo), São Paulo (SP), and Curitiba (PR – State of Paraná), where projects such as linear parks, filtering gardens, and urban vegetable gardens were already underway.

Maceres and Peres (2022) also systematized national experiences adopted (either in testing or prospective phases) following the onset of the pandemic. They highlighted aspects that emphasized active mobility, green infrastructure, as well as educational, cultural, and social mobilization efforts. These findings offer structured guidelines that can aid public administrators in decision-making processes. Ximenes et al. (2020a) assert that the utilization of green infrastructure enables the expansion of green areas within public spaces and fulfills crucial functions for socio-environmental quality. Such functions include providing opportunities for leisure and promoting public health, enhancing climate and air quality, establishing green corridors and eco-neighborhoods. Moreover, it fosters a sense of belonging among individuals towards public spaces, thereby reinforcing social relations, community engagement, and overall social well-being.

In addition to structural alterations, public open spaces have spurred changes in people's behavior as a means of self-protection and refraining the spread of the disease.

Research conducted by the Global Cities Program of the IEA-USP (Institute for Advanced





Studies – University of São Paulo) revealed that, following the initial months of lockdown, 85% of respondents expressed a desire to connect with nature. There was an observed shift in values among individuals who previously favored enclosed spaces for leisure activities (such as shopping malls or cinemas), but now, confronted with the challenges posed by the virus, sought to immerse themselves more deeply in natural environments (Ximenes et al., 2020b).

This has highlighted the significance of preserving open public spaces as paramount environments for urban interactions, along with the imperative connection to nature in green areas, a trend championed by numerous scholars owing to its myriad ecosystem services.

Perception studies have also gained widespread traction as a means to comprehend how individuals perceive nature across various spaces, including urban, rural, and conservation areas (Barbosa et al., 2021).

In the realm of public open spaces, perception studies have been conducted during the COVID-19 pandemic with the primary objective of understanding people's feelings regarding their altered relationships with spaces. These studies dove into individuals' satisfaction levels and expectations of public spaces, encompassing the socio-cultural shifts that have transpired (Favaretto et al., 2021; Júnior & Lira, 2021; Ribeiro et al., 2020).

The significance of these studies not only confirms the substantial shift in population habits and interests within urban centers due to the pandemic but has also called for a necessary restructuring of public policies aimed at urban spaces. These guidelines and policies should delineate the factors that entice the public out of their homes and channel efforts to create safer environments with adequate infrastructure, fostering positive individual behavioral practices.

Consequently, the rationale and importance of this sort of research lie in contributing to the debate as well as addressing this knowledge gap, which entails gaining a deeper understanding of the dynamics occurring in public spaces during the pandemic from the perspective of the space users. Furthermore, from the standpoint of public administration, it





involves deliberating new management principles and tools for these spaces, intersecting with interdisciplinary and urban policy considerations.

Thus, the objective of this study was to discern the perceptions of individuals who frequent public open spaces regarding social distancing, the utilization of public spaces, and the investments made by public authorities in these spaces during the COVID-19 pandemic.

Methodology

Study type and ethical aspects

The study is a cross-sectional research with a qualitative-quantitative approach, utilizing description, interpretation, and analysis to fulfill its objectives. According to Gil (2002), descriptive research aims to depict and comprehend the characteristics of a specific population or phenomenon and may also seek to establish relationships between variables. Furthermore, this research is of an applied nature, as it endeavors to produce information that can inform the advancement of urban policies.

Data collection was conducted through questionnaires administered in the cities of São Carlos (SP) and Araraquara (SP) between August and November 2022, a period characterized by increased flexibility in health protocols aimed at containing the spread of COVID-19. The interviews were carried out and the questionnaires completed by the researchers themselves, who had undergone prior training in ethical principles and current health protocols.

The research was conducted at the Federal University of São Carlos (UFSCar), adhering to all legal and regulatory procedures. This included compliance with CONSUNI Resolution No. 74, dated May 13, 2022, and COG Resolution No. 385, dated December 3, 2021, which outlined documentation requirements for questionnaire administrators, adherence to mandated vaccination programs, and protocols for COVID-19 prevention measures. Additionally, the study received approval from UFSCar's Human Research Ethics Committee (CEP), affiliated with the National Research Ethics Commission - CEP-CONEP System, under CAAE number: 63318622.6.0000.5504.





The ethical principles outlined in CNS Resolution No. 510 of 2016 were also observed, particularly concerning the confidentiality of obtained information. Confidentiality of participants' identities was maintained throughout all stages of the study. Upon administering the questionnaires, respondents were required to sign an Informed Consent Form (TCLE). Thus, the authorship of the statements was preserved, and due care was taken in formulating the questions and adapting them to each participant.

Population, period and characterization of the study area

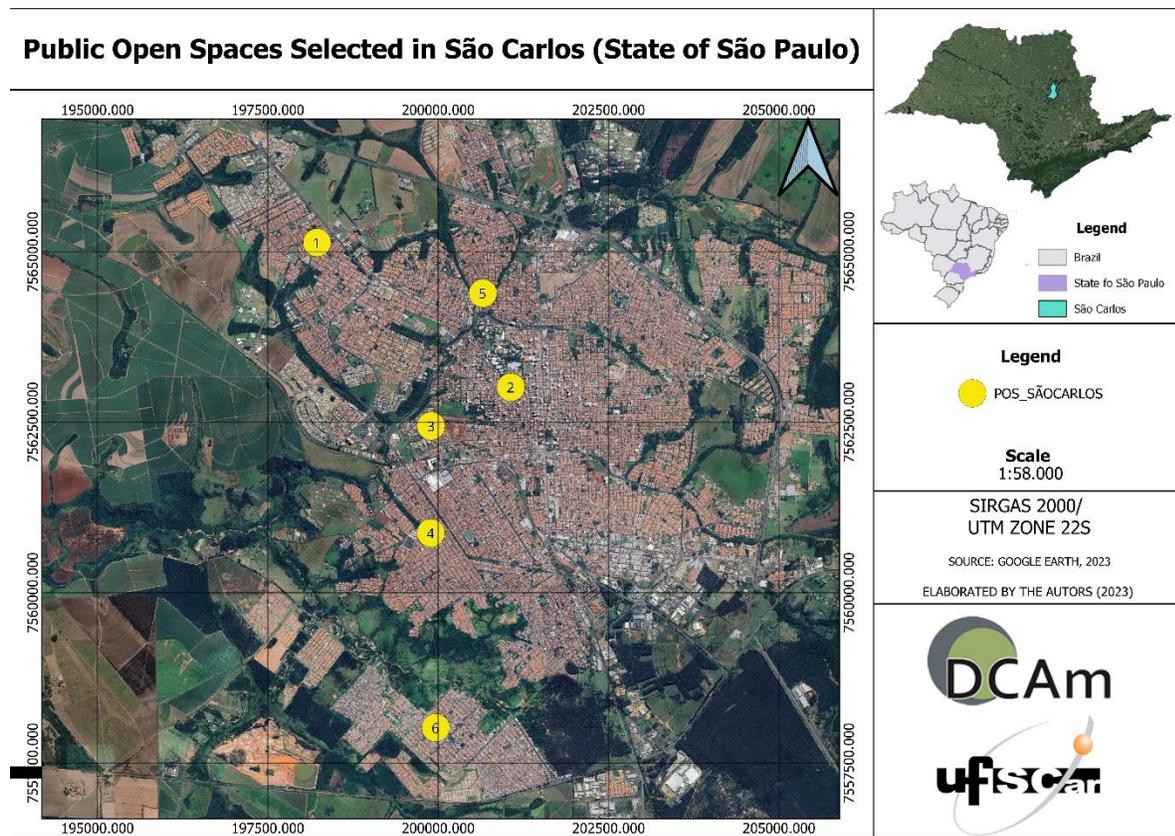
The study objects were the public open spaces of two medium-sized cities in the interior of São Paulo, Araraquara (SP) and São Carlos (SP), with populations of 242,200 inhabitants and 254,800 inhabitants respectively (Brazilian Institute of Geography and Statistics - IBGE, 2022). Six public open spaces were selected for each city. These spaces were chosen based on the following criteria: 1) heterogeneous distribution: spaces located in different parts of the urban territory; 2) income diversity: spaces located in neighborhoods with different income standards; 3) multifunctionality: spaces, traditionally frequented before the pandemic, that have multiple uses.

Figure 1 shows the location of the six spaces selected for the questionnaires in the city of São Carlos and Figure 2 shows each of these spaces: dos Coqueiros Square (1); XV de Novembro Square (2); SESC's Linear Park (3); Bicão Square (4); Kartódromo Park (5) and Ronald Golias Square (6).



Figure 1

Selected Public Open Spaces in São Carlos – State of São Paulo



Source: elaborated by the authors

Figure 2

Pictures of the Public Open Spaces selected in São Carlos – State of São Paulo

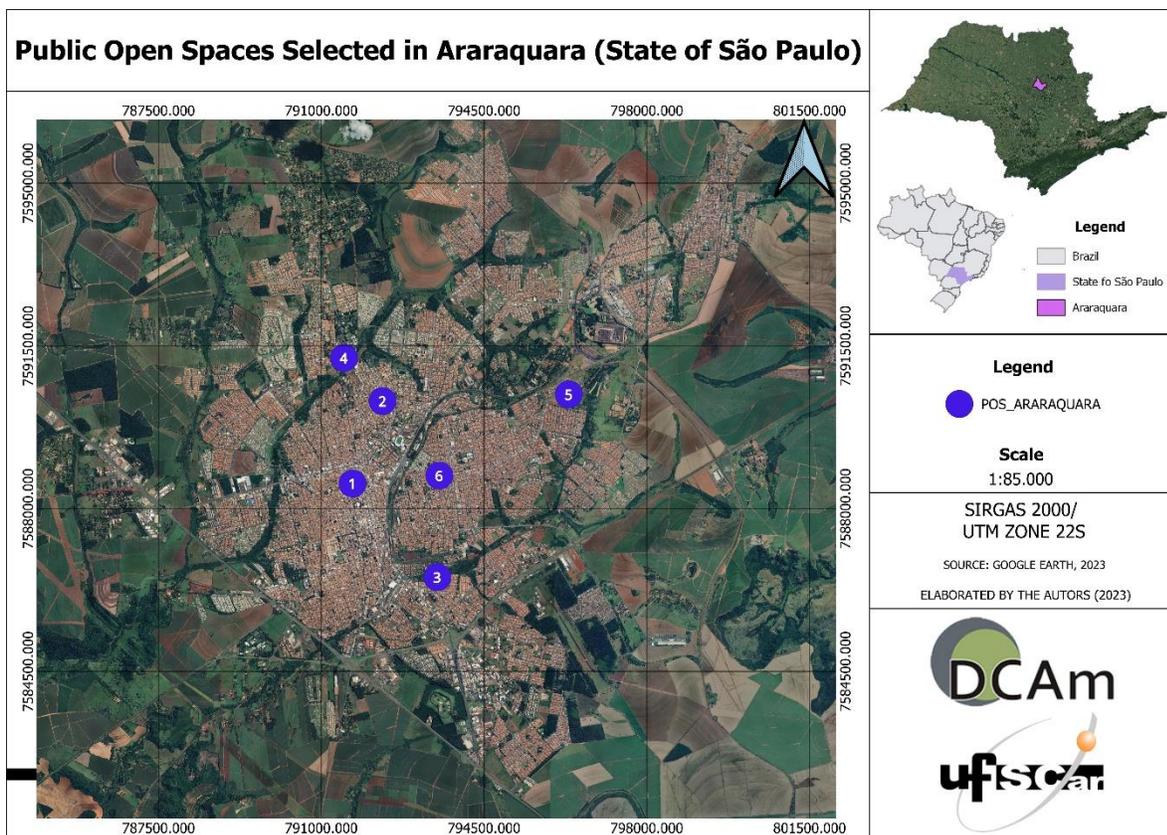


Source: elaborated by the authors

Figure 3 illustrates the location of the six spaces chosen for questionnaires in the city of Araraquara, while Figure 4 provides a visual representation of each space: Children's Park (1), Lawyers' Square (2), Carlos Guilherme Eduardo Fischer Sports and Leisure Center (3), Botanical Garden Woods (4), Pinheiro Park (5), and Paulina Montese Cruz Square (6).

Figure 3

Public open spaces selected in Araraquara – State of São Paulo



Source: elaborated by the authors

Figure 4

Pictures of the public open spaces selected in Araraquara – State of São Paulo



Source: elaborated by the authors

To conduct the questionnaires, the target population comprised individuals who utilized and frequented the 12 selected public open spaces in the survey. The survey aimed to include individuals aged 18 and above, with diverse social profiles, genders, and places of residence. Additionally, efforts were made to administer the questionnaires at various times of the day to accommodate a wide range of users, including families, athletes, seniors, groups of friends, and community activities, among others.

Methodological procedures and means of analyzing the results

The research method used was the Perception Questionnaire, which aimed to provide evidence and findings to support the formulation of analysis and recommendations for public open spaces during and after the pandemic.

To apply the method, a Questionnaire Model was structured, taking as a reference two published scientific studies that used the Perception Questionnaire method: 1) Research "Momentary Emotions: Post-Pandemic Behaviors and Everyday Habits", by the Global Cities Program of the Institute for Advanced Studies at the University of São Paulo (the results of which are published in Ximenes et al., 2020b); and 2) Research "Access to Public Spaces in the Pandemic", carried out by the SampaPé! Network (SampaPé, 2020).



The Model Questionnaire was structured into 25 questions, 20 of which were multiple choice or closed questions, and 5 open questions. The questions were divided into 4 groups: Group 1) questions relating to the identification of the respondent's profile in terms of age, gender, place of residence and perceptions of the neighborhood where they live; Group 2) questions relating to the feelings involved during the pandemic and the period of greater isolation; Group 3) questions relating to uses and behaviors in public spaces after the reopening; Group 4) questions relating to suggestions for changes and improvements to public open spaces in cities.

For each public open space, 20 questionnaires were administered, totaling 120 respondents in each city, and generating a total of 240 questionnaires answered in the survey, with no losses in the sample. This sample was based on a relative calculation for a sample considered significant, taking into account the number of inhabitants over the age of 18 in each city in the study and an estimate of users in the public spaces. All 25 questions were answered by a total of 120 participants in each city, although some of the questions allowed for more than one answer. The data was tabulated in spreadsheets and then transformed into bar graphs for better visualization. The data was then classified, categorized, and analyzed by surveying frequencies, comparing occurrences and analogies. Additionally, there was a correlation and discussion with the existing literature on the subject for a further analysis of the data.

Results and Discussion

The 240 interviews were conducted in 2022, during a period of increased flexibility in health protocols aimed at containing the spread of COVID-19. Of the 240 individuals interviewed, 51.6% identified as female, 47.5% as male, and 0.8% as "other."

Regarding the age distribution of respondents, the predominant age group comprised individuals aged between 26 and 45, accounting for 54.20% of participants. This was followed by the 46 to 59 age group (17.5%) and the 18 to 25 age group (15.8%). These three groups predominantly encompass adults, families with young children, or teenagers who, during the



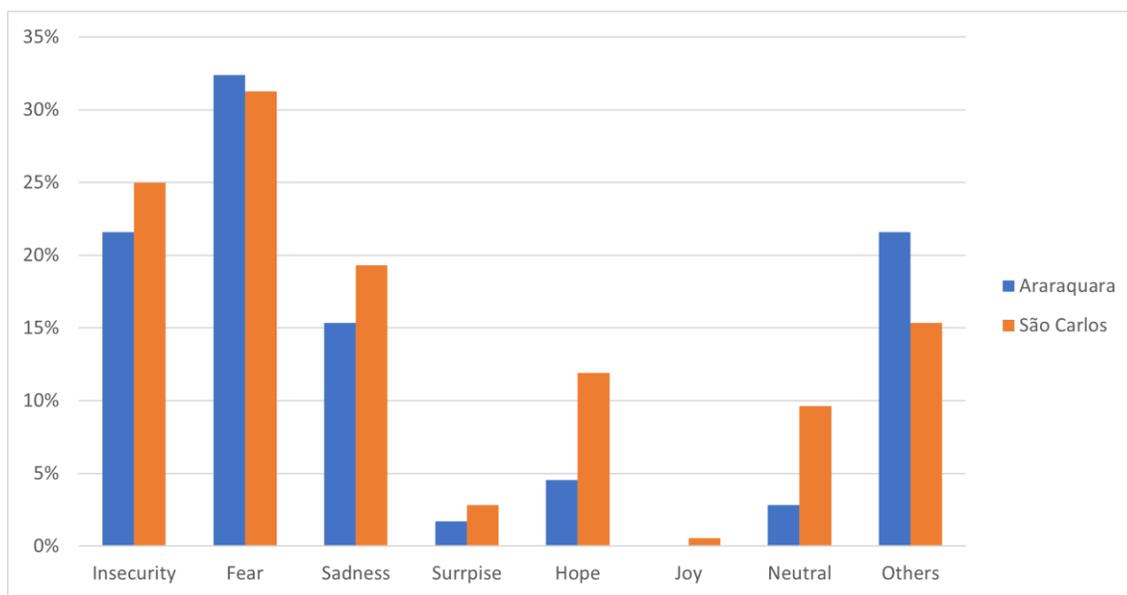
pandemic, transitioned to conducting their professional and educational activities from home. As such, they may have been the demographic group most inclined to seek out public open spaces during the period of flexibility for leisure, socialization, and stress relief from the lockdown.

Individuals aged 60 or over comprised 12.5% of respondents. It is presumed that, due to being the most vulnerable group to the disease, they were likely the most cautious in terms of mobility.

Concerning the emotions experienced during the peak of social isolation, the predominant feelings were associated with "fear, insecurity, and sadness." Positive emotions, such as "joy," were relatively rare, although some respondents expressed "hope for better days." Additionally, 17.1% of interviewees reported experiencing "other feelings," among which "anxiety" stood out, followed by "loneliness". The interviews showed that these emotions were largely attributed to disruptions in routine and the uncertainties stemming from the pandemic. Figure 5 illustrates the correlation between the emotions reported by respondents in the two cities.

Figure 5

Feelings experienced during the period of greater isolation from the COVID-19 pandemic



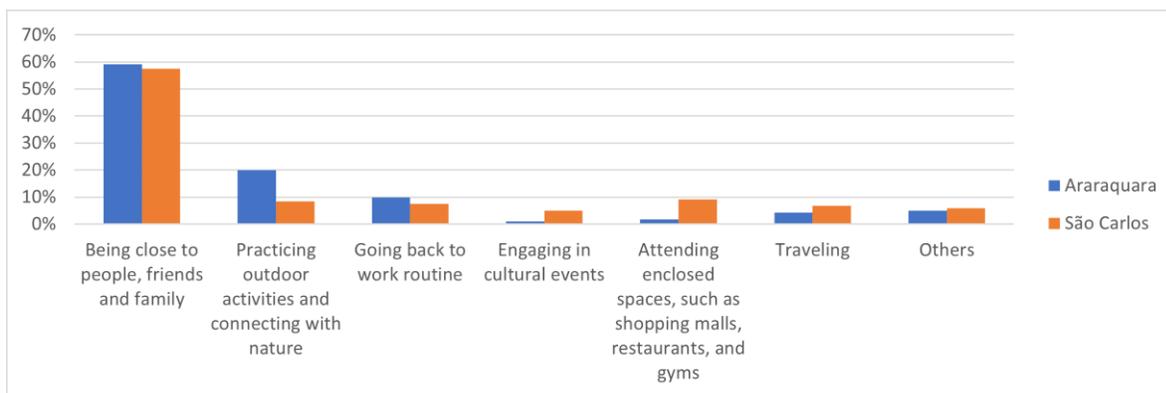
Source: elaborated by the authors

Similar research conducted by Ximenes et al. (2020b) also associated emotions like fear of death with uncertainties surrounding social and economic factors. The authors suggest that during periods of physical isolation, these emotions may stem from a perceived absence of elements deemed vital to people's lives, such as the freedom to roam outdoors, meet others, and commune with nature.

Consequently, participants were questioned about the alterations wrought in their daily routines, encompassing both personal and professional spheres. The aspects that emerged prominently as dearly missed by individuals were: "spending time with family and friends," "engaging in outdoor activities," and "connecting with nature" (See Figure 6).

Figure 6

What people have missed most during the COVID-19 pandemic



Source: elaborated by the authors

Additionally, in Figure 6, it is notable that a low percentage of responses in this survey pertained to visiting enclosed spaces such as shopping malls and restaurants (5.4%).

This observation stands in stark contrast to research conducted by the Global Cities Project of the IEA-USP, which found that between 75% and 67% of respondents intended to attend enclosed spaces like shopping malls and restaurants post-relaxation of social isolation measures (Ximenes et al., 2020b).

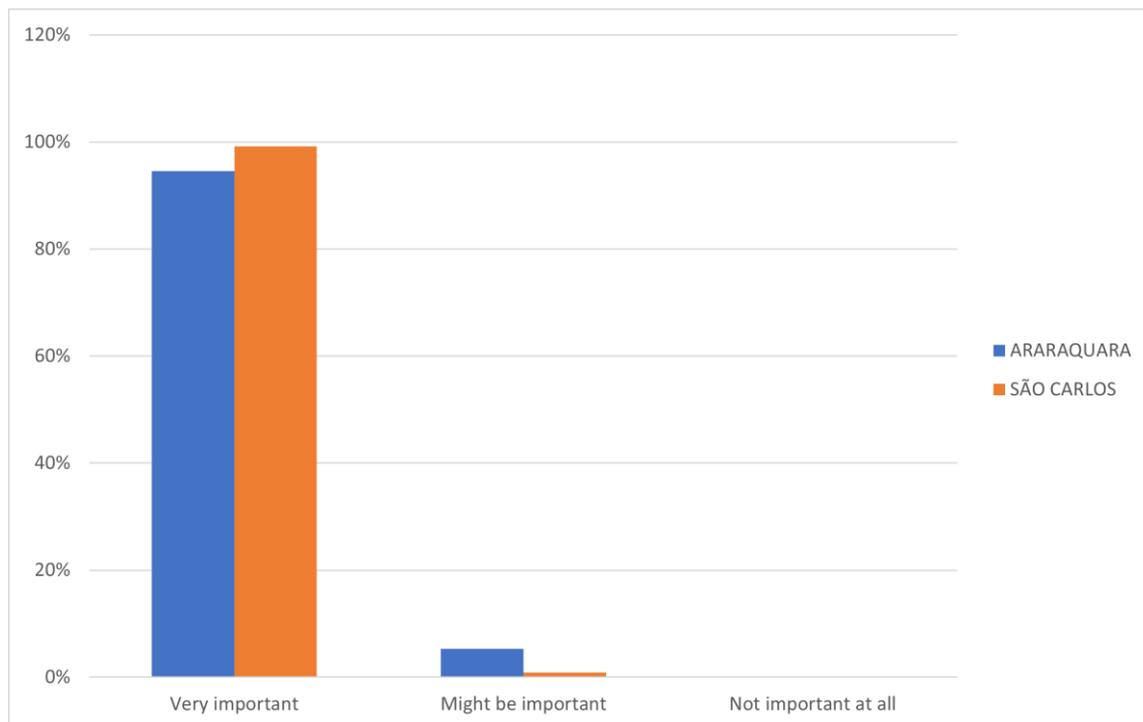
These discrepancies could be attributed to the fact that the surveyed cities, São Carlos and Araraquara, are medium-sized municipalities in the interior of the state, where such facilities

may be less prevalent compared to capital cities and metropolitan areas. This was due to the fact that around 70% of those interviewed were already in the habit of frequenting public open spaces even before the pandemic. Additionally, about 68% of participants from São Carlos and 76% from Araraquara expressed a longing for being in and utilizing squares, parks, and other public spaces during the period of stringent social isolation.

The significance attributed to public open spaces in the examined context became notably apparent when respondents were queried about the importance of squares and parks for physical, mental, and emotional well-being. Approximately 99% of respondents in São Carlos and 94% in Araraquara asserted that these spaces were "very important" in this regard. Moreover, while a segment of interviewees indicated that these spaces "might be important," there were no responses contesting the significance of open spaces for the population's health, as depicted in Figure 7 below.

Figure 7

The importance of open spaces for promoting physical, mental and emotional health



Source: elaborated by the authors

This information underscores a significant aspect, emphasizing the need to prioritize public management strategies and expand policies and programs for post-pandemic open spaces, which should represent advancements in the population's quality of life.

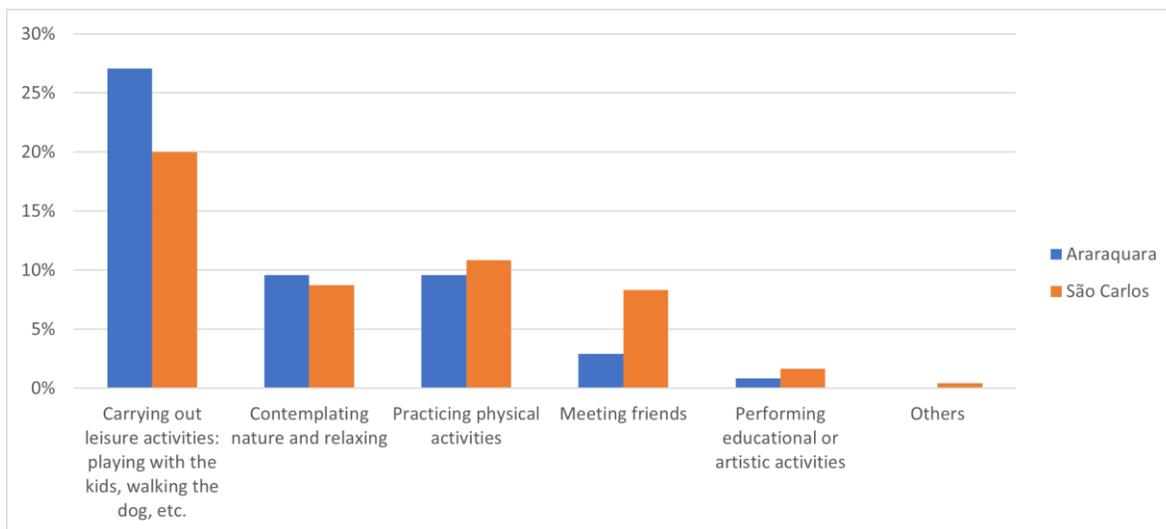
A study by Houlden et al. (2019) suggests a robust correlation between the presence of green spaces near an individual's residence and their feelings of life-satisfaction, happiness, and self-esteem.

Furthermore, research by Wang et al. (2019) indicates that teenagers residing within 350 meters of a green area showed a reduced risk of experiencing some form of severe psychological distress compared to those living in areas devoid of nearby green spaces.

Regarding preferred activities in public spaces, leisure activities, physical exercises, and communing with nature emerged as the most favored activities (See Figure 8).

Figure 8

Activities that people most enjoy in public open spaces



Source: elaborated by the authors

Authors argue that the presence of green open spaces can enhance urban microclimates, improve neighborhoods, promote social interaction and physical exercise, fostering a more positive perception of urban spaces among people and, consequently,



improving quality of life (Favaretto et al., 2021).

According to Fajersztajn et al. (2016), proximity to green areas encourages physical activity, leading to a less sedentary lifestyle and reducing the risk of cardiovascular and psychological diseases. Research conducted by Van der Berg et al. (2016) in European cities demonstrated that increased time spent in green spaces correlated with higher mental health ratings, irrespective regardless of cultural and climatic contexts.

Matozinhos et al. (2015) conducted a study in Belo Horizonte – State of Minas Gerais, which revealed that regions boasting a high number of parks and public spaces for sports activities are associated with a reduced prevalence of obesity. Additionally, Saldiva (2016) underscores that residing within 300 meters of a park reduces the risk of death from acute myocardial infarction by 30%, a percentage higher than that attributed to medications used for lowering blood cholesterol.

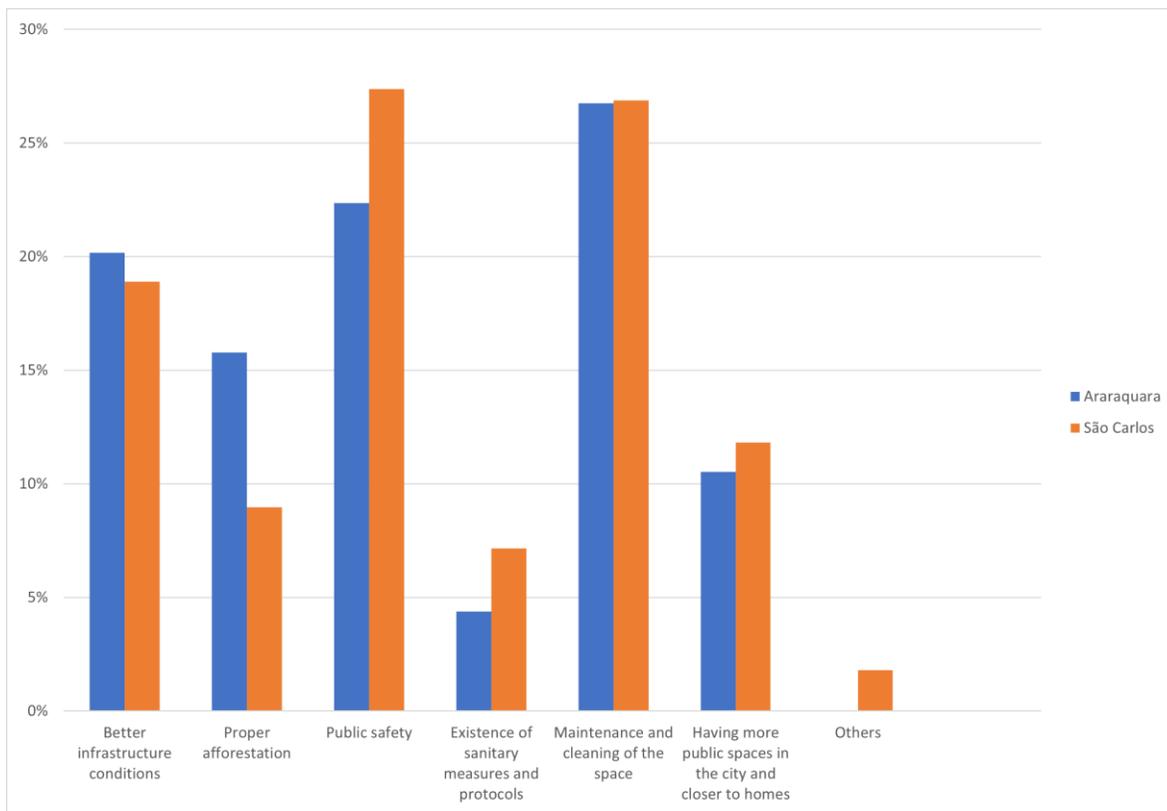
Despite participants in both cities acknowledging the significance of public open spaces and noting a conspicuous increase in the utilization of squares and parks during the period of heightened flexibility in pandemic-related health protocols, there was a simultaneous perception that these spaces received little public investment and, consequently, insufficient care.

The interviewees perceived a state of neglect in these areas. The study revealed that only one of the squares examined in São Carlos (dos Coqueiros Square) underwent renovation work during the pandemic, albeit without subsequent maintenance.

Regarding suggestions for enhancing public open spaces, “ensuring ongoing maintenance and cleanliness” emerged as ongoing public management measures, alongside “improving safety for users” and “upgrading the infrastructure conditions of these areas”. These aspects were prominently highlighted in both São Carlos and Araraquara, as depicted in Figure 9.

Figure 9

Suggestions for improving public open spaces



Source: elaborated by the authors

Enhancing public open spaces is a pivotal aspect of city management. Simply increasing the number of spaces is insufficient; they must be improved to organize elements that collectively fulfill various needs such as leisure, mobility, participation, protection, employment, and health.

Gonçalves (2018) conducted a study on Public Green Areas in São Carlos (SP), exploring the relations between distribution, usage, ecological, and social functions. The study revealed that the city boasts a satisfactory number of public green spaces (780 areas), which could contribute to the establishment of a System of Free Spaces (SEL), integrating urban landscapes with peri-urban and even rural landscapes. However, despite their quantitative abundance, these spaces suffer from a low level of qualification. They lack designs that promote multiple uses, stumble to host socio-cultural activities, and lack integrated planning,

management, and maintenance initiatives.

The author's analysis reveals that most of the areas (almost 60%) fall under the category of Green Areas Partially Qualified for Public Use. These spaces feature vegetation and road access but lack minimal leisure facilities, indicating only a potential for diverse uses by the population. Even though they have vegetation, many of these green areas are poorly situated in the urban landscape and fail to foster social interaction. Their subpar quality renders them susceptible to private appropriation and improper use, posing potential public health, and safety risks (Gonçalves, 2018).

Lee et al. (2015) emphasize that enhancing the qualification, distribution, and functions of green spaces is a fundamental aspect of urban planning. Such efforts must also prioritize community needs and overcome economic and market-driven priorities.

When queried about suggestions and measures to be implemented by public authorities to mitigate the spread of COVID-19 and other diseases in open spaces, respondents suggested the provision of personal hygiene items like hand sanitizer, the installation of informational signage and posters, increased public awareness, continued usage of face masks, vaccination incentives, the expansion of green spaces within cities, and the monitoring of these areas.

Furthermore, the survey unveiled that the most frequented open spaces in both São Carlos and Araraquara were situated in central regions. This underscores the existing inequality in the distribution and qualification of green areas across Brazilian cities, as well as in other contexts, a disparity exacerbated by the pandemic. Residents of peripheral neighborhoods face limited access to well-equipped open spaces. Addressing this imbalance in the location and distribution of public open spaces should be a structuring issue in planning, aiming to integrate these areas with residential and occupational hubs for the population.

Tão et al. (2016) conducted a qualitative and quantitative assessment of green areas in peripheral neighborhoods within São Carlos, revealing that while these areas are adequately distributed in some neighborhoods, they are challenging for residents to access or situated on



the outskirts of residential subdivisions. Similarly, Faustino et al. (2016) demonstrated that the more peripheral regions of the city provide a poorer recreational system for the population, being underserved and lacking in quality.

Ferguson et al. (2018) conducted research examining the distribution of public green spaces in Bradford, United Kingdom, which is characterized by high levels of racial-ethnic inequality. The findings highlighted that neighborhoods with superior park quality and accessibility predominantly comprised high-income families or had a high proportion of white families.

Similarly, Ngom et al. (2016) address the disparities in access to green spaces in Montreal and Quebec, Canada, considering various factors such as socioeconomic status, population density, location, form, and functions of these spaces. Their findings indicate that good access to green areas hinges on several factors including connectivity to active transportation networks like bike paths and walking trails, interaction with natural barriers such as bodies of water and slopes, as well as artificial barriers like streets, avenues, or highways, alongside navigating socio-political realities. Additionally, they observed better social equity in green space access in Quebec, attributed to the development of linear parks that integrated regions along rivers, offering amenities like cycling and walking trails.

Morero et al. (2017) identified an uneven distribution of green spaces in the municipality of Campinas, São Paulo, with a concentration in areas inhabited by higher-income populations. To address this disparity by providing a more equitable and fair distribution of these areas, the authors developed a methodological approach to identify priority sites for implementing green spaces, considering both anthropic and natural factors. The most important anthropogenic factors included population density, age distribution, and income level, while natural attributes comprised, in this order of importance: the presence of forest remnants and tree clusters, water sources, and unique landscape features. Integrating these factors yielded strategic guidelines for green space implementation in Campinas.



Ungolini et al. (2020) propose concrete urban planning measures to integrate green open spaces of varying sizes throughout cities and neighborhoods, ensuring access for all residents.

When responding to open-ended questions, interviewees emphasized the importance of organizing events and cultural activities in open spaces. They noted that better infrastructure and events directly contribute to increased use, longer stays and appreciation of these areas.

Carrus et al. (2015) found that factors such as good accessibility, diverse uses, and a range of activities are crucial in attracting people to spend extended periods in natural environments, fostering opportunities of deeper and more meaningful interactions with nature.

Being a multidisciplinary area, Taylor and Hochuli (2017) indicate that research and action on green spaces will not progress if they do not consider the results of multiple disciplinary fields, due to the complexity of how these spaces are integrated, especially in cities, where social and ecological components are under pressure associated with urbanization.

Innovative approaches to urban planning suggest reimagining open spaces as decentralized meeting points distributed as a system into the city's fabric. This entails fostering connections with public institutions, such as schools, which can open their common spaces and promote cultural activities, and streets, which can be repurposed for pedestrian use to promote active mobility (Maceres & Peres, 2022).

Furthermore, fostering the empowerment of community associations, promoting participatory management, and ensuring sustained funding through cross-sector partnerships are important strategies. Engaging in active participation and conducting structured assessments can help identify the genuine needs and aspirations of urban residents, ensuring optimal utilization of spaces and financial resources.

Melo et al. (2016) advocate for actions from public authorities to engage society, proposing to foster shared responsibility in protecting and maintaining parks and public green areas. They emphasize the importance of environmental perception and appreciation, coupled



with education focused on critical thinking, as avenues for promoting the conservation of open spaces and favoring social transformation.

Regarding the limitations of this study, while efforts were made to administer questionnaires across the 12 open spaces in the two cities, and to include neighborhoods representing various social classes, more specific segments for analysis were not outlined. Therefore, future studies could delve into this aspect, encompassing a diverse range of ages, genders, disabilities, social classes, and different racial and ethnic groups. This approach could contribute to a more comprehensive and nuanced understanding of various social groups' perceptions of open spaces, as well as their usage patterns and behaviors.

Conclusions

The research conducted in two medium-sized cities in the interior of the state of São Paulo revealed that despite prevalent feelings of fear and anxiety at various times during the COVID-19 pandemic, public open spaces emerged as safe and conducive environments for engaging in physical activities, socializing with friends and family, enjoying leisure time, alleviating stress, and connecting with nature. This underscores the crucial role of public open spaces in fostering urban resilience during times of crisis, as evidenced by recent experiences.

Spaces equipped with ample amenities and high-quality infrastructure, alongside those hosting educational and cultural activities, emerged as particularly appealing to the population. The enhancement and effective management of public open spaces through cultural, educational, and community engagement initiatives hold the potential to significantly enhance public awareness, perception, and identity regarding these areas so that, as well as being conserved, they become effective educational spaces.

Respecting territorialities, traditions, and experiences should also be an integral part of urban public policies in order to value the histories, memories and governance of the residents themselves, thereby building active citizenship.

The interviewees emphasized the need for continuous management processes to





ensure that the population increasingly utilizes and appropriates qualified spaces with security, justice, and inclusion.

The growing consideration of social and justice aspects in planning processes has guided actions focused on better distribution and inclusion of open spaces. To this end, new parameters and procedures for the design, location, distribution, and connection of public spaces to other urban systems must be included in municipal regulation processes.

Certainly, the insights gleaned from the years of the pandemic offer many lessons, and the research discussed here demonstrates how the findings and recommendations regarding new habits and behaviors can contribute to fresh public policies for open space utilization in Brazilian cities, taking into account diverse realities and contexts. There's scope for further investigation, including perception studies in other municipalities and the application of alternative social analysis methodologies. Undoubtedly, research and practice should align with a political stance that upholds social functions and a committed management for all.

In March 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. By May 2023, the WHO had rescinded the Public Health Emergency of International Concern. If the era of COVID-19 has led to a reevaluation of the importance and value of public open spaces, then our focus should be on intensifying planning efforts and connecting the measures to preserve these spaces with other contemporary challenges, such as climate action.

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