

Deodoro Sports Complex/Rio de Janeiro: Perception of safety and the use of olympic equipments in the post-game period

Complexo Esportivo de Deodoro/Rio de Janeiro: Percepção de segurança e o uso dos equipamentos olímpicos no período pós-jogos

Complejo Deportivo Deodoro/Rio de Janeiro: Percepción de seguridad y uso de los equipamientos olímpicas en el período posterior a los juegos

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To cite this paper: SILVA, G. C. da. Deodoro Sports Complex/Rio de Janeiro: Perception of safety and the use of olympic equipments in the post-game period. *Cadernos de Pós-Graduação em Arquitetura e Urbanismo*, São Paulo, v. 25, n. 1, p. 96-110, 2025.

DOI 10.5935/cadernospos.v25n1p96-110

Submitted: 2024-03-20

Accepted: 2024-09-27



Abstract

This article investigates the relationship between the perception of safety among different groups of people in Olympic areas and their use during the post-games period. The study was conducted at the Deodoro Sports Complex in Rio de Janeiro, which hosted events during the 2016 Olympics. Data were collected through questionnaires, with 132 responses from users of the Deodoro Sports Complex facilities and 108 from local residents. Additionally, interviews were conducted with 32 users, 20 local residents, and seven employees of the Complex. The questionnaire data were analyzed using the statistical software SPSS/PC through frequency analysis and non-parametric statistical tests, while the interview data were interpreted qualitatively. The results reveal that the perception of insecurity in the Deodoro Sports Complex is driven by the lack of police surveillance in the public open spaces and knowledge of crimes in the area. Moreover, the fact that people feel the need for more security personnel in large open areas could be addressed by adding facilities and activities that attract users and, consequently, contribute to the supervision of these areas, such as cafés and restaurants.

Keywords: Perception. Security. Deodoro Sports Complex. Post-game use

Resumo

Este artigo investiga a relação entre a percepção de segurança de diferentes grupos de pessoas em áreas olímpicas e seus usos no período pós-jogos. O estudo foi realizado no Complexo Esportivo de Deodoro, Rio de Janeiro, que recebeu as Olimpíadas de 2016. Os dados foram coletados por questionários, sendo 132 com usuários dos equipamentos do Complexo Esportivo de Deodoro e 108 com moradores do entorno. Também foram realizadas entrevistas com 32 usuários, 20 moradores do entorno e sete funcionários deste Complexo. Os dados dos questionários foram analisados no programa estatístico SPSS/PC por meio de frequências e testes estatísticos não-paramétricos e das entrevistas por meio de interpretações. Os resultados revelam que a percepção de insegurança no Complexo Esportivo de Deodoro é sustentada pela ausência de polícias fazendo a vigilância do espaço aberto público e pelo conhecimento de crimes na região. Por sua vez, o fato de as pessoas sentirem falta da maior supervisão de guardas em grandes áreas abertas poderia ser tratado também pela inclusão de equipamentos e atividades que sirvam como atratores de usuários e, logo, contribuam para a supervisão dessas grandes áreas, tais como cafeterias e restaurantes.

Palavras-chave: Percepção. Segurança. Complexo Esportivo de Deodoro. Uso pós-jogos



Resumen

Este artículo investiga la relación entre la percepción de seguridad de diferentes grupos de personas en las áreas olímpicas y sus usos en el período posterior al juego. El estudio se realizó en el Complejo Deportivo Deodoro, Río de Janeiro, sede de los Juegos Olímpicos de 2016. Los datos fueron recolectados a través de cuestionarios, 132 de usuarios de los equipos del Complejo Deportivo Deodoro y 108 de residentes cercanos. También se realizaron entrevistas a 32 usuarios, 20 vecinos del entorno y siete empleados de este Complejo. Los datos de los cuestionarios fueron analizados en el programa estadístico SPSS/PC mediante frecuencias y pruebas estadísticas no paramétricas y entrevistas mediante interpretaciones. Los resultados revelan que la percepción de inseguridad en el Complejo Deportivo Deodoro se sustenta en la ausencia de vigilancia policial en el espacio público abierto y en el conocimiento de los delitos en la región. A su vez, el hecho de que las personas echamos de menos una mayor supervisión por parte de los guardias en grandes áreas abiertas también podría abordarse mediante la inclusión de equipos y actividades que sirvan como atractores de usuarios y, por tanto, contribuyan a la supervisión de estas grandes áreas, como cafeterías y restaurantes.

Palabras clave: Percepción. Seguridad. Complejo Deportivo Deodoro. Uso posterior al juego

INTRODUCTION

Although the International Olympic Committee (IOC) does not explicitly link the use of Olympic facilities to the safety of the host city, interest in this topic has significantly increased since the tragic events of the 1972 Munich Olympic Games. During that event, a terrorist attack resulted in the deaths of nine Israeli athletes, highlighting the critical importance of security at large-scale events (Boykoff & Fussey, 2014; Spaaij, 2016). According to the Olympic Charter (IOC, 2017), the IOC is responsible for ensuring the organization of the Games, while the safety of the host city falls under the jurisdiction of local governmental authorities. During the Games, security measures are usually heightened, often with an increase in police presence, as observed by Gaffney (2015).

However, various crimes such as theft and vehicle break-ins in public areas occur under specific conditions and motivations. Certain physical environmental characteristics can reduce the occurrence of these crimes and promote a sense of safety, making these spaces and their accessible facilities more effectively utilized (Newman, 1972; Poyner, 1983).

According to Francis (2003), the perception of safety is crucial for a positive assessment of public spaces. Conversely, when there is a sense of insecurity or apprehension about a particular environment, people tend to avoid it, even if it is



well-designed and attractive. The fear of crime drives people away from streets, parks, and plazas, especially at night, which becomes a barrier to participating in public life. This avoidance further intensifies the feeling of insecurity, as highlighted by Hillier et al. (1993), Gehl (2010), and Jacobs (2014), who note that a greater number of people present in public spaces contributes to a sense of protection and reduces the likelihood of crime.

Additionally, the aesthetics of buildings and open spaces significantly impact the perception of safety. Well-maintained areas tend to evoke a stronger sense of security compared to neglected ones (Newman, 1972; Saville & Cleveland, 1998). Regular maintenance and proper cleanliness of these spaces also foster a more favorable environment for social activities outdoors (Gambim, 2007; Reckziegel, 2009). Neglecting maintenance can signal disinterest from residents or authorities, potentially increasing vandalism and other property crimes (Newman, 1972). Lighting at night also plays a crucial role in how safe people feel (Gehl, 2010; Jacobs, 2014; Polko & Kimic, 2022), as poorly lit areas are often perceived as unsafe and more prone to acts of vandalism and other crimes due to reduced visibility (Voordt & Wegen, 1990).

These characteristics—pleasant appearance, maintenance, cleanliness, and lighting—are common in Olympic areas during the mega-event, as many venues are newly constructed and have been used sparingly or not at all. However, after the Games, proper care is not always taken, as evidenced by the underutilization of facilities in various editions of the event (Raeder, 2010), such as the Volleyball Arena in Beijing, in 2008 (Yu, 2012).

Moreover, the concept of territorial control, which relates to the sense of ownership and belonging that individuals feel toward urban spaces, is highlighted by some scholars as crucial for security (Newman, 1972; Saville & Cleveland, 1998). This control can be established through physical or symbolic barriers and helps regulate social norms, promoting both actual and perceived safety. Although typically applied to demarcating public and private spaces in residential areas (Newman, 1972), territorial control is also evident in Olympic areas, such as the location of facilities within military zones, which are often restricted to military personnel (Silva & Mattos, 2015). An example of this is the Deodoro Sports Complex in Rio de Janeiro, which hosted the 2016 Olympic Games. This location is surrounded by military housing, which may limit public access and negatively impact the legacy of the event (Patreze, Silva & Uvinha, 2019). However, this measure can also offer additional security to visitors in the region (Silva & Mattos, 2015).

Regarding the perception of safety in Olympic areas, studies have primarily focused on the period of the mega-event (e.g., Neirotti & Hilliard, 2006; Konstantaki & Wickens, 2010; Boo & Gu, 2013), due to the history of terrorist attacks during or around the time of the Olympic Games (such as Munich in 1972, Atlanta in 1996, and London in 2012) and their impact on spectators' decisions to attend them (Neirotti & Hilliard, 2006). In terms of safety in Olympic areas after the Games,



Bertuzzi and Cardoso (2018) conducted an exploratory study in Rio de Janeiro's Olympic Park, interviewing 32 users. The study questioned the safety within the park, which, due to its size, had limited police presence. Additionally, safety in the Olympic Park was rated by interviewees on a scale of 1 to 10, resulting in an average score of 7.97. This rating was attributed to the absence of known crimes reported by users and the presence of some security guards on-site.

The exploratory study by Silva and Reis (2018) also analyzes safety in Rio de Janeiro's Olympic Park, where four interviewed users gave positive assessments of the site's security. However, among the 35 neighborhood residents who frequented the park, only five mentioned safety as a positive aspect. The study also examines the Olympic facilities in the Deodoro Sports Complex, revealing that among the 17 residents interviewed near the Radical Park, five expressed concerns about insecurity due to incidents such as fights, thefts, and drug use near the Olympic area. Additionally, of the 22 people interviewed who used the Youth Arena, four mentioned that the facility's location within a military area contributed to enhanced security. Nevertheless, the study addressed the issue of security only when interviewees mentioned it as a positive or negative factor.

Therefore, the characteristics of open public spaces can influence how they are perceived in terms of safety and, consequently, their usage. However, there is a lack of studies addressing the perception of safety in Olympic areas, particularly from the perspective of users and local residents (Silva & Reis, 2018; Bertuzzi & Cardoso, 2018). Moreover, it is important to highlight the relevance of considering the perception of safety among different groups of people, as feelings of insecurity may vary depending on factors such as gender and age (Carro, Valera & Vidal, 2008; Mehta, 2013; Polko & Kimic, 2022). Thus, the objective of this article is to investigate the relationship between the perception of safety among different groups of people in Olympic areas and their use during the post-games period.

METHODOLOGY

To meet the objective of this research, the study focuses on the Deodoro Sports Complex in Rio de Janeiro, which hosted events during the 2016 Olympics. The complex is composed of seven facilities: the Canoe Slalom Pool, BMX Track, Youth Arena, Hockey Center, Modern Pentathlon Pool, National Shooting Center, and Equestrian Center (Figure 1). These facilities are in the Deodoro neighborhood, which was highlighted in the bid documents as the area with the highest concentration of young people in the Rio de Janeiro metropolitan region (Rio de Janeiro Bid Committee, 2009). According to the Brazilian Institute of Geography and Statistics (IBGE, 2010), Deodoro has 4,277 young residents up to 24 years old, with most households earning a monthly income between two and five times the minimum wage. In this context, the construction of new sports facilities was seen to enhance social and athletic development opportunities for the young people in the surrounding communities (Rio de Janeiro Bid Committee, 2009).



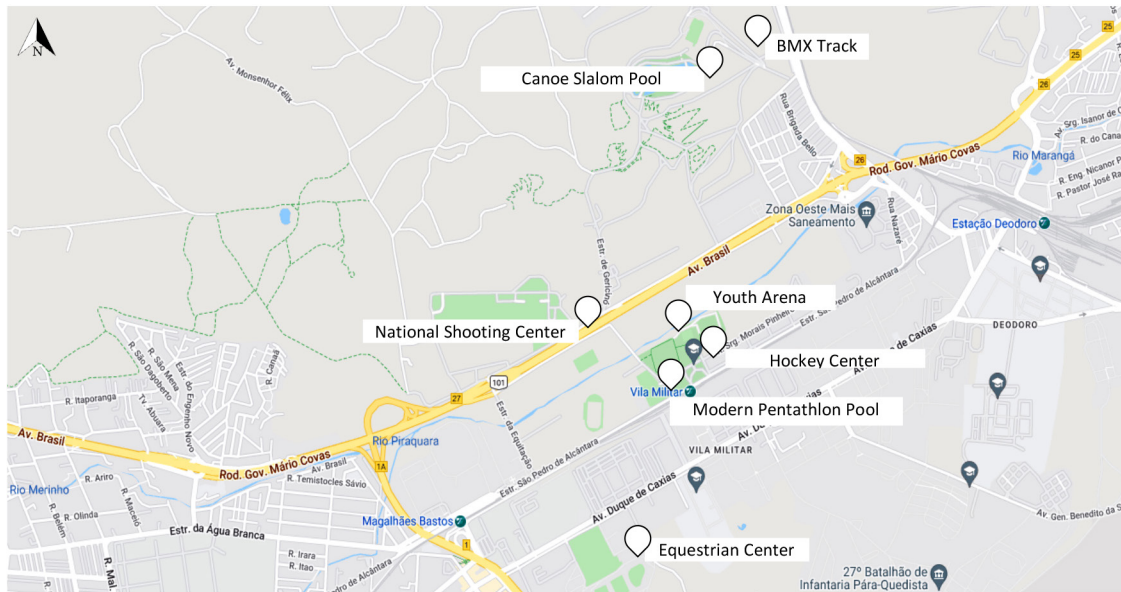


Figure 1: Location of the Olympic facilities at the Deodoro Sports Complex. Source: Adapted by the author from Mapstyle (2023).

Although the Rio de Janeiro City Hall considers the location of the Olympic facilities in Deodoro, the area belongs to the Vila Militar, a neighborhood largely restricted to military use (Davies, 2014). This neighborhood is predominantly inhabited by people aged 35 to 49, followed by those aged 25 to 34, with a household monthly income typically ranging from two to five times the minimum wage (IBGE, 2010).

Although the Olympic facilities are all part of a single sports complex, they were not built in an enclosed area and are accessed via different routes. The Canoe Slalom Pool and BMX Track are accessed from Marechal Alencastro Road; the Youth Arena, Hockey Center, and Modern Pentathlon Pool from São Pedro de Alcântara Road; the National Shooting Center from Gericinó Road; and the Equestrian Center from Duque de Caxias Avenue.

To achieve the proposed objective, data collection was conducted in two stages: archival research and field research. The archival research involved reviewing relevant literature and documents from the Rio de Janeiro Public Security Institute, which provided information on types of crimes (e.g., pedestrian and vehicle theft) and their respective occurrences in the Vila Militar neighborhood. The field research consisted of administering questionnaires and conducting structured interviews.

Questionnaires were conducted online with users of the Deodoro Sports Complex facilities and residents of the surrounding areas, using the LimeSurvey platform. The link to the questionnaire was distributed via social media (Instagram and WhatsApp), and in person using a tablet with internet access provided by the researcher, totaling 240 respondents.



The user questionnaire was conducted between November 8 and December 19, 2019, with participants being approached at the following facilities: Canoe Slalom Pool, Youth Arena, National Shooting Center, and Hockey Center. Users who could not complete the questionnaire at the time were asked to provide their WhatsApp numbers to receive the survey link later. Respondents were also encouraged to share the questionnaire with their contacts to increase response numbers. A total of 132 questionnaires were completed, 100 fully and 32 partially.

The resident questionnaire was administered between November 15 and 26, 2019. Residents were contacted in the following ways: (i) via Instagram using check-ins from the Deodoro and Vila Militar neighborhoods, with the survey link sent to them; (ii) via WhatsApp through referrals from other residents, with the link being shared; and (iii) in person outside their homes using a tablet with internet access provided by the researcher. A total of 108 questionnaires were completed, 62 fully and 46 partially. The surveyed residents live within 5 kilometers from the Olympic facilities, as those living close to the BMX Track and Canoe Slalom Pool (within 2 kilometers) are farther from the Equestrian Center (up to 5 kilometers).

Interviews were conducted with users of the Deodoro Sports Complex facilities, local residents, and employees of the Complex, totaling 59 interviews. Among the 32 users interviewed between November 21 and December 4, 2019, 23 were contacted and interviewed in person during events at the Canoe Slalom Pool, Youth Arena, and National Shooting Center. The remaining nine were contacted via WhatsApp, referred by other users, and interviewed through the same app. Additionally, 20 local residents were interviewed between November 17 and 21, 2019, with personal interviews conducted outside their homes. Lastly, seven employees of the facilities were interviewed between October 18 and November 21, 2019, as follows: (i) one event manager from the Radical Park (where the BMX Track and Canoe Slalom Pool are located), contacted and interviewed in person at Carioca Arena 3 in the Olympic Park; (ii) one administrator from Radical Park, contacted via WhatsApp through an employee referral and interviewed in person at the park; (iii) one social responsibility analyst, an employee of SESC (Social Service of Commerce) at the Radical Park unit, contacted and interviewed in person at the park; (iv) one manager of the National Shooting Center, contacted via email and interviewed via WhatsApp; (v) one manager of the Army Training Center responsible for the Youth Arena, Hockey Center, and National Shooting Center, contacted directly through WhatsApp via an employee referral and interviewed via the same app; (vi) one officer in charge of the club where the Modern Pentathlon Pool is located, contacted and interviewed in person at the facility; and (vii) one equestrian commander of the Army, contacted via WhatsApp through an employee referral and interviewed via the same app. As a selection criterion for this sample, each Olympic facility had to have at least one employee interviewed.

Data from questionnaires were analyzed using the statistical software SPSS/PC (Statistical Package for the Social Sciences) through frequency analysis and the



following non-parametric statistical tests: (i) cross-tabulation (Phi); (ii) Kruskal-Wallis (K-W); and (iii) Mann-Whitney U (M-W). Data from the structured interviews were analyzed through qualitative interpretations.

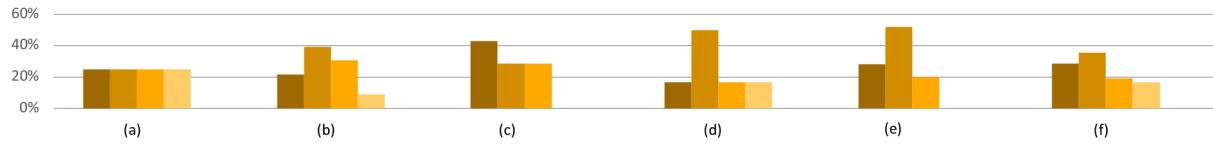
RESULTS

Security at the Deodoro Sports Complex was rated very positively by the seven employees interviewed. The reasons for this assessment include being located in a military area (71.43% - 5 out of 7), the absence of thefts (14.28% - 1 out of 7), and the presence of security provided by the military police, municipal guards, and the army (14.28% - 1 out of 7). Additionally, one employee (Interviewee 2) mentioned that on event days, when there is a higher volume of people, the event organizer provides its own security.

For the users of the Deodoro Sports Complex who were surveyed, the security of the location was rated as moderate (67.29% positive ratings; 10.28% negative ratings) (Figure 2), mainly due to reports of vehicle thefts (81.82%) and thefts from pedestrians (45.45%) (Table 1). However, there were no statistically significant differences in security ratings based on gender (Mann-Whitney U test) or age group (Kruskal-Wallis test). Nevertheless, men reported a slightly higher perception of security in the area (74.51% positive ratings; 9.8% negative ratings) compared to women (62% positive ratings; 12% negative ratings). Additionally, young people aged 14 to 18 also reported higher positive ratings (69.56% positive; 4.35% negative) compared to other age groups (Figure 3).

Security was perceived negatively by some users (31.25% - 10 out of 32 interviewees), primarily due to pedestrian thefts (100%) (Table 1). One user (Interviewee 9), who lives in the area, remarked, *"Security in the surroundings is poor. Yesterday, [criminals] passed by my house with rifles, and that didn't used to happen here. We need more security."* However, the negative evaluations came exclusively from users of the Canoe Slalom Pool, which, although located in the Vila Militar, is farther from the area secured by the Army.





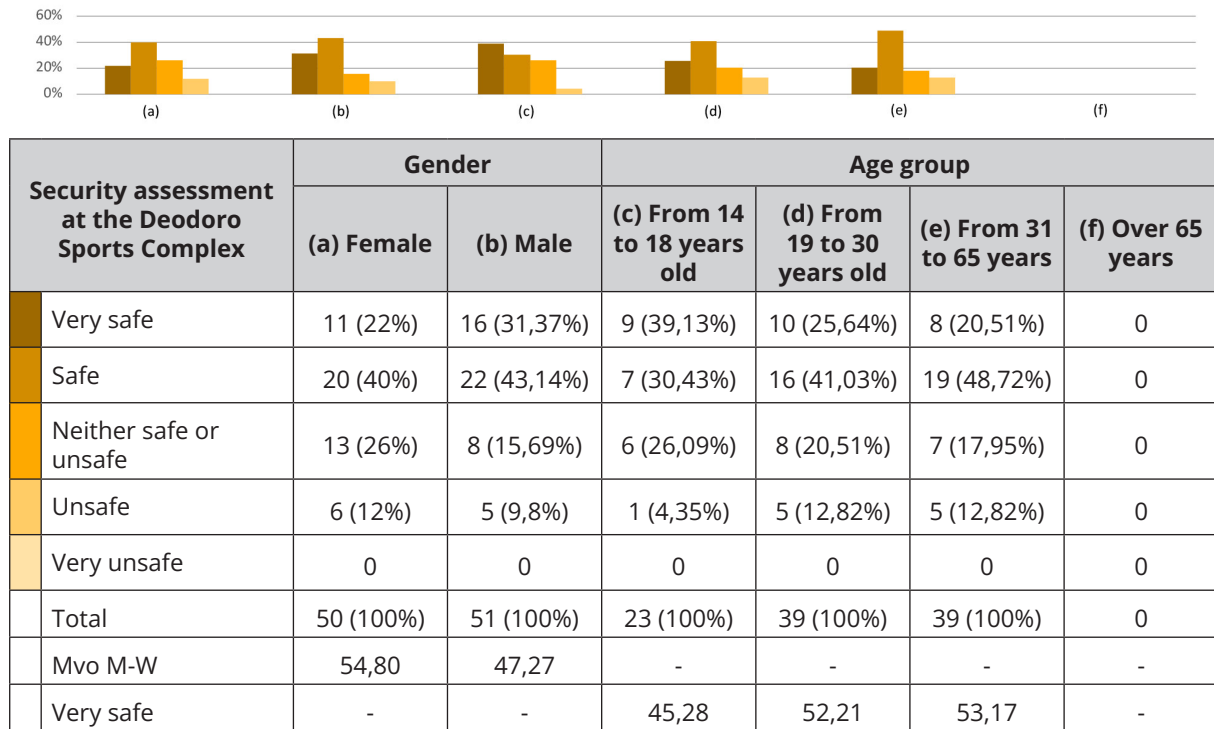
Security assessment at the Deodoro Sports Complex		Frequency of use of the Deodoro Sports Complex					
		(a) Every day of the week (4)	(b) Between 5 and 6 times a week (23)	(c) Between 3 and 4 times a week (7)	(d) Between 1 and 2 times a week (6)	(e) Between 1 and 3 times a month (25)	(f) Less than once a month (42)
Very safe		1 (25%)	5 (21.74%)	3 (42.86%)	1 (16.67%)	7 (28%)	12 (28.57%)
Safe		1 (25%)	9 (39.13%)	2 (28.57%)	3 (50%)	13 (52%)	15 (35.71%)
Neither safe nor unsafe		1 (25%)	7 (30.43%)	2 (28.57%)	1 (16.67%)	5 (20%)	8 (19.05%)
Unsafe		1 (25%)	2 (8.7%)	0	1 (16.67%)	0	7 (16.67%)
Very unsafe		0	0	0	0	0	0

Figure 2: Evaluation of safety at the Deodoro Sports Complex by its users questioned according to frequency of use. Source: Author (2022).

Positive reviews (very safe and safe)				
Reasons	Users questioned	Residents questioned	Users interviewed	Residents interviewed
Military personnel provide security around the equipment	56 (77,78%)	23 (58,97%)	15 (75%)	5 (50%)
Robberies rarely happen	22 (30,55%)	17 (43,59%)	3(15%)	3 (30%)
No robberies	19 (26,39%)	7 (17,95%)	0	2 (20%)
There is a lot of movement at the Deodoro Sports Complex	0	0	2 (10%)	0
Total sample	72 (100%)	39 (100%)	20 (100%)	10 (100%)
Negative ratings (very unsafe and unsafe)				
Existence of vehicle thefts	9 (81,82%)	3 (42,86%)	0	0
Existence of pedestrian robberies	5 (45,45%)	4 (57,14%)	10 (100%)	6 (66,67%)
There are no military personnel providing security around the equipment	3 (27,27%)	2 (28,57%)	2 (20%)	2 (22,22%)
People from outside the neighborhood come to the events	0	0	0	2 (22,22%)
Total sample	11 (100%)	7 (100%)	10 (100%)	9 (100%)

Table 1: Justifications for each group's assessment of safety at the Deodoro Sports Complex. Source: Author (2022).





Note: mvo M-W = mean of ordinal values obtained using the Mann-Whitney U test; mvo K-W = mean of ordinal values obtained using the Kruskal-Wallis test.

Figure 3: Evaluation of safety at the Deodoro Sports Complex by users questioned according to gender and age group. Source: Author (2022).

For the local residents surveyed near the Deodoro Sports Complex, security in the area was rated as moderate (57.35% positive ratings; 10.29% negative ratings) (Figure 4). This assessment was primarily due to incidents of pedestrian theft (57.14%), vehicle theft (42.86%), and the absence of military personnel providing security around the facilities (28.57%) (Table 1). There were no statistically significant differences in security evaluations based on gender or age group among local residents (Mann-Whitney U test), indicating that the moderate security assessment was shared by both men and women and by people aged 19 to 65 (Figure 5). Additionally, negative evaluations of security at the Deodoro Sports Complex were provided by 45% of the interviewed residents (9 out of 20). The reasons cited include pedestrian thefts (66.67%), an influx of people from outside the neighborhood due to events (22.22%), and the lack of military patrols in the area (22.22%) (Table 1).

Therefore, while security at the Deodoro Sports Complex is perceived as very positive by its employees, it is rated as moderate by its users and local residents. This suggests that, despite the Olympic equipments being located in a military area, where the surrounding neighborhood is primarily inhabited by military personnel, this alone is not sufficient to ensure that the area is considered entirely safe, given the occurrence of pedestrian and vehicle thefts.



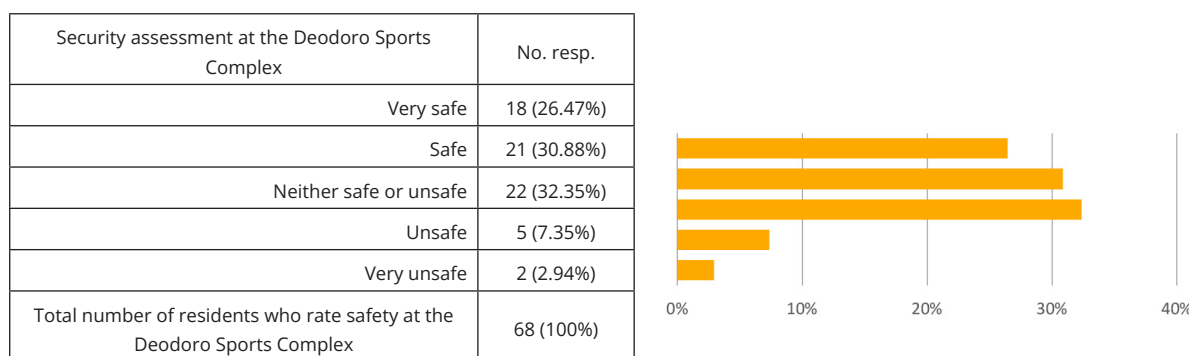
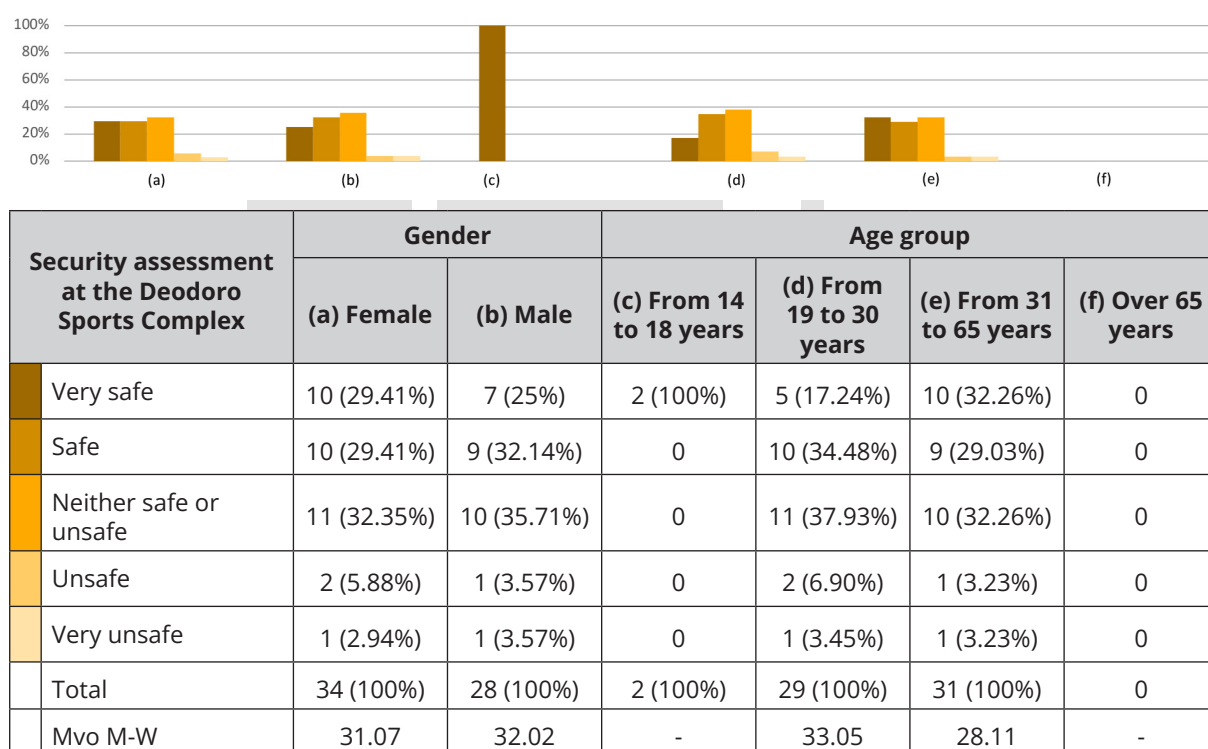


Figure 4: Security assessment at the Deodoro Sports Complex by the local residents questioned. Source: Author (2022).



Note: mvo M-W= mean of ordinal values obtained using the Mann-Whitney U test.

Figure 5: Safety assessment at the Deodoro Sports Complex by local residents questioned according to gender and age group. Source: Author (2022).

Despite the awareness that Rio de Janeiro is known for high levels of urban violence, according to the documents from the Rio de Janeiro Public Security Institute, Vila Militar ranked as the 18th neighborhood (out of 154) with the lowest number of pedestrian thefts and the 50th (out of 154) with the lowest number of vehicle thefts in 2019. While these figures confirm that such crimes occur at lower rates in Vila Militar compared to other neighborhoods in the city, they are still significant enough to create a sense of insecurity among local residents and users of the Olympic equipment. Thus, increased surveillance around these installations by the military police and/or the Army could help reduce the number of crimes



and improve the sense of security for both users and nearby residents. However, it is understood that the perception of safety is only one factor that influences the use of the facilities. It is also necessary to investigate other aspects, such as the activities offered at these locations, as well as their accessibility and location.

FINAL CONSIDERATIONS

The perception of insecurity at the Deodoro Sports Complex is associated with the absence of police monitoring in public open spaces and awareness of crimes such as pedestrian and vehicle thefts. Given that urban space users also contribute to natural surveillance, the diversity of activities around the Olympic area becomes relevant, as it allows a wider variety of people to occupy the streets for longer periods, as noted by some authors (Gehl, 2010; Jacobs, 2014). Furthermore, while military areas tend to have lower crime rates (pedestrian and vehicle thefts), which could enhance the sense of security for users, the occupation of the surrounding areas of the Deodoro Sports Complex by institutional and residential buildings exclusively for the Army reduces the use of urban space by the general population, leading to a greater sense of insecurity. These findings reinforce the importance of police or security personnel monitoring public open spaces to improve the perception of safety, as well as the need for diverse uses (e.g., cafés, snack bars, restaurants, and bars) within and around Olympic areas to attract more people, which supports natural surveillance.

In this regard, it is evident that the lack of diverse activities and the predominance of restricted access areas contribute to the creation of monofunctional urban spaces, which tend to empty out outside of institutional or military operating hours. This lack of urban vitality, combined with the absence of commercial infrastructure or services for the civilian population, generates a perception of insecurity. It reinforces the notion that, although the Olympic area was planned with significant investment for short-term events, it was not properly integrated into the urban fabric in the post-Games period. Thus, the legacy of the Deodoro Sports Complex is marked by its disconnection from the daily lives of local residents and primary users.

Moreover, the study found that men perceive security at the Deodoro Sports Complex more positively than women, and young people (aged 14 to 30) have a higher sense of security than older age groups (over 31). These findings align with studies showing that women tend to feel less secure than men in urban parks in Poland (Polko & Kimic, 2022) and in public spaces in the Poble Sec neighborhood of Barcelona (Carro, Valera & Vidal, 2008) and in North American cities (Boston, Cambridge, Somerville, Brookline in Massachusetts, and Tampa, St. Petersburg, Sarasota in Florida) (Mehta, 2013). Additionally, these results are consistent with research indicating that the perception of insecurity tends to increase as people age (Carro, Valera & Vidal, 2008). The differences in these perceptions underscore the importance of developing strategies to enhance safety in public spaces so that they can be frequented by all, regardless of gender or age group.



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